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- 200 mg Capsule
- 400 mg Capsule
- 37.5 ml PFS
- 50 ml PFS
- 50 ml Forte PFS
- 21 ml PD

Mextil
Cefuroxime

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- 500 mg Tablet
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- 70 ml PFS
- 50 ml DS PFS

Winner
Ceftriaxone

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- 500 mg IV Injection
- 1 gm IV Injection
- 2 gm IV Injection

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- 100 ml PFS

Cipcin
Ciprofloxacin

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- 500 mg Tablet
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- 100 ml IV Infusion

Amotid
Amoxicillin

- 250 mg Capsule
- 500 mg Capsule
- 15 ml PD
- 100 ml PFS
- 100 ml Forte PFS

Erosa
Erythromycin

- 250 mg Tablet
- 500 mg Tablet
- 100 ml PFS

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Phenoxymethyl Penicillin

- 250 mg Tablet
- 100 ml PFS

Riboclin
Clindamycin

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Amotid-CL
Amoxicillin & Clavulanic acid

- 625 mg Tablet
- 100 ml PFS

Mexclav
Cefuroxime+Clavulanic Acid

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- 70 ml PFS

Maczith
Azithromycin

- 250 mg Capsule
- 500 mg Tablet
- 15 ml PFS
- 35 ml PFS
- 50 ml PFS

Mepen
Meropenem

- 500 mg IV Injection
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Supracef
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- 250 mg Capsule
- 500 mg Capsule
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- 100 ml PFS
- 100 ml Forte PFS

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Levofloxacin

- 500 mg Tablet
- 100 ml Oral Solution

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Gemifloxacin

- 320 mg Tablet

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Doxycycline

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Zidimax
Ceftazidime

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Association of C-reactive Protein in Preeclampsia

Jahanara Akter^{*1}, Shamsun Nahar Begum², Pervin Akter³, Mamata Manjuri⁴, Zenat Rehana⁵,
Umme Salma⁶

Abstract

Introduction: Preeclampsia is a multisystemic disorder that complicate about 7-10 percent of human pregnancies. Worldwide this syndrome contributes high maternal and perinatal mortality and morbidity. C-reactive protein, a marker of tissue damage and inflammation, is elevated in serum in overt preeclampsia. It is used as an objective and sensitive index of overall inflammatory activities in the body. **Aims and Objectives:** To explore the association of C-reactive protein level with the preeclampsia patients. **Materials and Methods:** The present study was a Case –Control study, conducted in the Department of Obstetrics and Gynaecology in collaboration with the Department of clinical pathology of Sir Salimullah Medical College Hospital, Mitford, Dhaka during the period of January 2013 to December 2013. The study population was pregnant women with preeclampsia and normal term pregnant patients admitted during study period. A total of 66 patients were included in the study. Among them 33 were clinically diagnosed preeclampsia women grouped as Cases and another 33 were age, parity and BMI matched term pregnant women as Controls. Estimation of serum C-reactive protein was done by Nyco Card Reader-II method (Appendix-11). Statisticians analysis was perform by using SPSS. **Results:** C-reactive protein concentration (mg/L) was found significantly higher ($p<0.001$) in case group (17.93 ± 10.5) than control group (7.45 ± 1.80). C-reactive protein was $\geq 6\text{mg/L}$ in 29(87.9%) in case group and 9 (27.3%) in control group and C-reactive protein values showed significant positive correlation with systolic and diastolic blood pressure ($p<0.001$) in case group. C-reactive protein concentration was found significantly higher ($p<0.001$) in severe preeclampsia group than mild preeclampsia group. **Conclusion:** Therefore, it can apparently be concluded from this study that increased maternal serum C-reactive protein level might be a strong risk factor for preeclampsia, although the precise role of C-reactive protein in this regard whether causal or consequential, is yet to be determined. Finding of this study might be helpful for formulating a guideline for management of pregnant women with preeclampsia.

Key Words: C-reactive Protein, Preeclampsia.

Number of Tables: 09, Number of References: 17, Number of Correspondence: 05.

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Introduction:

Preeclampsia is one of the most common medical complication during second half of pregnancy¹. Preeclampsia is defined as, the rise of blood pressure equal to or above 140/90mm Hg in the presence of proteinuria developed after 20 weeks of gestational age in a previously normotensive and non proteinuric women². Preeclampsia can result in eclampsia when convulsion develops or manifests as hemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome. Eclampsia and HELLP syndrome are associated with severe complications such as cerebral hemorrhage, renal insufficiency, lung oedema and liver hemorrhage³. Incidence of preeclampsia is about 7-10 percent throughout the world⁴. In India, the incidence as recorded from hospital statistics varies widely from 5 to 15% percent². Both the incidence & prevalence of preeclampsia and eclampsia is higher in our country. In Sir Salimullah Medical College Hospital, 290 preeclamptic patients were admitted among 13404 obstetric patients in 2012. A maternal mortality of 15 percent still occurs with modern obstetric services⁵. Women who receive no prenatal care are 12 times as likely to die from preeclamptic complication as women who do receive prenatal care⁶. Preeclampsia accounts for 80-84 percent of low birth weight babies. These low birth weight babies are now the major groups of newborn being cared in the neonatal intensive care units worldwide. Endothelial dysfunction is accompanied by elevated levels of inflammatory markers which have been shown to be much higher in women with preeclampsia than those of normal pregnancy¹. C-reactive protein, as an acute phase reactant, belongs to the pentraxin family of calcium dependent ligand binding plasma protein. It is produced by hepatocytes in response to injury, inflammation, infections and malignant neoplasia. It has short half life, which is constant under all condition of health and disease⁷. Recent studies have been suggested that increased level of CRP is associated with an abnormal systemic endothelial vascular reactivity⁸. CRP is used mainly as a marker of inflammation. Measuring and charting of CRP values can prove useful in early determining of disease, disease progress or effectiveness of treatments⁹. Since maternal health and pregnancy outcome is drastically affected by hypertensive disorders of pregnancy so early detection and timely intervention to minimize the harm should be to our utmost attention and interest.

Materials & Methods:

This case control study was conducted in the Department of Obstetrics and Gynaecology in collaboration with the Department of clinical pathology of Sir Salimullah Medical College Hospital, Mitford, Dhaka during the period of January 2013 to December 2013. The study population were pregnant women with preeclampsia and normal term pregnant patients admitted during study

period. A total of 66 patients were included in the study. Among them 33 were clinically diagnosed preeclampsia women grouped as Cases and another 33 were age, parity and BMI matched term pregnant women as Controls, taking by consecutive sampling. The patients were enrolled following inclusion & exclusion criteria. **Inclusion criteria are age** - 24-35 years, gestational age - 28-40 weeks and term pregnant patients as matched controls. **Exclusion criteria are** patients with preexisting hypertension, renal diseases –such as glomerulonephritis, nephrotic syndrome, diabetes mellitus, thyroid dysfunction and pyrexia. The research protocol was approved by the institutional ethical review committee. Keeping compliance with Helsinki Declaration for medical research involving human subject 1964, patient was informed verbally about the study, the underlying hypothesis and right for the participant to withdraw from the project at any time, any reason. Written consent was obtained from each patient. It was assured that all records approach would be kept confidential and procedure will be helpful for both the physician and patient in making rational approach regarding management of the cases. Provisional diagnosis of preeclampsia was done by careful history taking and clinical examination. Enrolled patients were asked to take part in an hour-long face to face interview. For recording purpose a predesigned data collection sheet was used, to elicit information regarding maternal socio-demographic characteristics, medical history & family history. A detailed past obstetric history and investigations results were included in the data collection sheet. Gestational age was calculated from the LMP and with the early date ultrasonogram records. Physical examination and anthropometric measurement (height, weight) of each study subject was taken and recorded. With full aseptic precaution two ml of venous blood was drawn from each of the study subjects. Then blood was transferred into a clean test tube and transported to the clinical pathology laboratory. Random urine sample was collected in a clean test tube and analyzed for presence of protein by dipstick reagent strip. Estimation of serum C-reactive protein was done by Nycocard Reader-II method (Appendix-11). The data were screened and checked for any missing value and discrepancy and compiled. All data were recorded in tabulated form and the result was expressed as mean $\pm$ SD. SPSS software was used to analyze the data. Unpaired t test, chi-square test and r test were used to see the level of significance. 95% confidence limit ($p < 0.05$) was taken as level of significance.

Results:

C-reactive protein concentration (mg/L) was found significantly higher ($p < 0.001$) in case group (17.93 ± 10.5) than control group (7.45 ± 1.80). C-reactive protein was ≥ 6 mg/L in 29(87.9%) in case group and 9 (27.3%) in control group and C-reactive protein values showed significant positive correlation with systolic and diastolic

blood pressure ($p<0.001$) in case group. C-reactive protein concentration was found significantly higher ($p<0.001$) in severe preeclampsia group than mild preeclampsia group. The findings of the study obtained from data analysis are documented below.

Table I shows no significant difference between mean age of case and control group but highly significant difference between mean gestational age in both groups.

Table I : Comparison of age and gestational age of the study subjects

Variable	Case (n=33)	Control (n=33)	p-value
	Mean $\pm$ SD (Range)	Mean $\pm$ SD (Range)	
Age (years)	26.76 $\pm$ 3.37 (24-35)	26.70 $\pm$ 2.85 (24-35)	0.876
Gestational age (weeks)	37.36 $\pm$ 2.57 (28-40)	39.12 $\pm$ 0.93 (37-40)	<0.001

Data were analysed using Unpaired t-Test and were presented as mean $\pm$ SD. $p<0.05$ is statistically significant.

Table II shows that the case and control groups were almost identical regarding their gravidity.

Table II : Distribution of gravidity in the study subjects

Variable	Case (n=33)	Control (n=33)	p-value
Gravida	Total no. Percentage	Total no. Percentage	0.319
Primi	16 (48.5)	12 (36.4)	
Multi	17 (51.5)	21 (63.6)	

Data were analysed using chi-square test.

$p<0.05$ is statistically significant

Table III shows no significant difference between the case and control groups regarding their antenatal care.

Table III : Status of Antenatal care in the study subjects.

Variable	Case (n=33)	Control (n=33)	p-value
Antenatal care	Total no. Percentage	Total no. Percentage	
Regular	14 (42.4)	17 (51.5)	0.115
Irregular	19 (57.6)	16 (48.5)	

chi-square test was done to analyse the data.

$p<0.05$ is statistically significant.

Table IV shows that over 52.9% of the case group had history of preeclampsia in previous pregnancy as compared to only 4.7% of the control group.

Table IV : Distribution of the study subjects according to history of preeclampsia in previous pregnancy.

Variable	Case (n=17)	Control (n=21)	p-value
History of preeclampsia	Total no. Percentage	Total no. Percentage	
Present	9 (52.9)	1 (4.7)	0.006
Absent	8 (47.0)	20 (95.2)	

chi-square test was done to analyse the data.

$p<0.05$ is statistically significant.

Table V shows significant difference between the case and control groups regarding BMI, Systolic blood pressure and Diastolic blood pressure respectively.

Table V : Comparison of physical examination findings in the study subjects

Variable	Case (n=33)	Control (n=33)	p-value
	Mean $\pm$ SD (Range)	Mean $\pm$ SD (Range)	
BMI (kg/m ²)	23.37 $\pm$ 1.47 (20-26)	21.81 $\pm$ 1.45 (18-24)	<0.001
Systolic blood pressure (mmHg)	148.33 $\pm$ 13.41 (140-170)	108 $\pm$ 7.14 (100-120)	<0.001
Diastolic blood pressure (mmHg)	106.67 $\pm$ 6.99 (100-120)	69.67 $\pm$ 5.56 (60-80)	<0.001

Data were analysed using Unpaired t-Test and were presented as mean $\pm$ SD.

$p<0.05$ is statistically significant.

Table IV shows that Serum C-reactive protein level was found ≥ 6 mg/L in 29 (87.9%) women in case group and only 9 (27.3%) women in the control group respectively. Serum C-reactive protein level was found <6 mg/L in majority (72.7%) of the control group.

Table VI : Serum C-reactive protein status in the study subjects.

Parameter	Case (n=33)	Control (n=33)	p-value
CRP status	Total no. Percentage	Total no. Percentage	
(≥ 6 mg/L)	29 (87.9)	9 (27.3)	<0.001
(<6 mg/L)	4 (12.1)	24 (72.7)	

chi-square test was done to analyse the data.

$p<0.05$ is statistically significant.

Table VII shows that Serum C-reactive protein level was found <6 mg/L in 72.7% of control group. Majority of cases and control group were within the range of 6-15mg/L. Only case group were found within the range of 16-25 mg/L and ≥ 26 mg/L of Serum C-reactive protein concentration.

Table VII : Distribution of serum C-reactive protein level in the study subjects.

Parameter	Case (n=33)	Control (n=33)	p-value
CRP level (mg/L)	Total no. Percentage	Total no. Percentage	
<6	4 (12.1)	24 (72.7)	
6-15	15 (45.4)	9 (27.2)	
16-25	9 (27.2)	0 (0)	<0.001
≥ 26	5 (15.1)	0 (0)	

chi-square test was done to analyse the data.

$p<0.05$ is statistically significant.

Table VIII shows the mean serum C-reactive protein concentrations with its range in the study subjects when concentrations were ≥ 6 mg/L; which in case & control were 17.93 $\pm$ 10.05 (6-48) mg/L and 7.45 $\pm$ 1.80 mg/L (6-15) respectively and serum C-reactive protein concentrations were higher in case group than control group.

Table VIII : Serum C-reactive protein status in the study subjects when concentration were ≥ 6 mg/L.

Variable	Case (n=24)	Control (n=9)	p-value
Serum C-reactive protein level	Mean $\pm$ SD (Range)	Mean $\pm$ SD (Range)	
(≥ 6 mg/L)	17.93 $\pm$ 10.05 (6-48)	7.45 $\pm$ 1.80 (6-15)	<0.001

Data were analysed using Unpaired t-Test and were presented as mean $\pm$ SD.

p<0.05 is statistically significant.

Table IX shows that mean serum C-reactive protein concentrations level were higher in the severe preeclampsia group than those in the mild preeclampsia group.

Table IX : Serum C-reactive protein status in mild and severe preeclampsia patients

Parameter	Mild preeclampsia (n=24)		Severe preeclampsia (n=9)	p-value
CRP status	Total no	percentage	percentage	
(≥ 6 mg/L)	20	(83.4)	(0)	<0.001
(<6 mg/L)	4	(16.7)	(0)	
Mean $\pm$ SD	12.92 $\pm$ 5.7		27.78 $\pm$ 17.37	
Range (mg/L)	(3 – 25)		(6 – 48)	

Data were analysed using Unpaired t-Test and were presented as mean $\pm$ SD.

p<0.05 is statistically significant.

Discussion:

In this Case-Control study, the serum C-reactive protein concentration have measured in preeclamptic women (case) and normotensive term pregnant women (control) to evaluate the association of C-reactive protein level in preeclamptic women. In this study mean age of case group was 26.76 $\pm$ 3.37 years. Most subjects in both groups were within range of 24-29 years of age and Muslims. This was nearly consistent with several other study^{8,10,11}. The present study has revealed the mean serum C-reactive protein concentration was 7.45 $\pm$ 1.80 mg/L (range of 6-15 mg/L) in control group. Mean serum C-reactive protein concentration found in case group was 17.93 $\pm$ 10.05mg/L (range of 6-48 mg/L). This study has shown mean serum C-reactive protein concentration in preeclampsia cases significantly high in comparison to control (P < 0.001). Same phenomenon observed in many other studies around the world^{3,12,13,14,15}. Considering preeclampsia sub types of this study, serum C-reactive protein concentration in severe preeclampsia group found significantly higher (P < 0.001) than that of mild preeclampsia. This is harmonious with some other studies done abroad^{4,12,15,16}. In this study, it was found that C-reactive protein levels were significantly higher (P < 0.001) in preeclampsia women and positively correlated to the degree of blood pressure elevation. Same phenomenon observed in many other studies^{3,13,15}. In Present study, serum C-reactive protein was found within the range of 6-15 mg/L in 45.4% of cases and 27.2% of controls. About 72.7% control and only 12.1% of cases are found <6mg/L. Serum C-reactive protein concentration was found to be maximum in severe preeclampsia group (48 mg/L) and lowest in control group (03mg/L). The results of present study are not in agreement with those of other study¹⁷ who reported in their cross sectional study, that maternal serum C-reactive protein is not elevated with preeclamptic women when compared with normal term pregnant women but increased when compared to non

pregnant women. Probable explanation of disagreement may be attribute to several factors such as variable demographic characteristics of patients under study, wide variability of serum C-reactive protein in infection, inflammation, tissue damage and malignant neoplasia in general poulation & variation in prevalence of subclinical infections of women under studies etc. In fact, the path physiology of preeclampsia is still unknown and precise role of C-reactive protein in this regard is still cloudy. One school of thought proposes that overt or occult inflammation as the cause of preeclampsia and raised serum C-reactive protein to be simply the marker of inflammation as a component of acute phase reactant, which expected to help in promising the diagnostic and prognostic potentials.

Conclusion:

The study concludes that serum C-reactive protein level was found to be significantly higher in preeclamptic patients. It signifies strong association of C-reactive protein with preeclampsia in our Bangladeshi women. Higher the severity of preeclampsia, serum C-reactive protein tends to be higher.

Conflict of Interest: None.

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References:

1. Sibai and Baha. Diagnosis and management of gestational hypertension and pre-eclampsia. *Obstet. Gynecol.* 2003; 102: 181-192.
<https://doi.org/10.1097/00006250-200307000-00033>
[https://doi.org/10.1016/S0029-7844\(03\)00475-7](https://doi.org/10.1016/S0029-7844(03)00475-7)
PMid:12850627
2. Dutta DC. Hypertensive Disorder in Pregnancy in Text book of Obstetrics. 7th Edition. Konar Hiralal, Calcutta India. 2011; 219-230.
3. Kumru S, Godekmerdan A, Kutlu S and Ozcan A. Correlation of maternal serum high- sensitive C-reactive protein-levels with biochemical and clinical parameters in preeclampsia. *Eur Obstet Gynecol Reprod Biolo.* 2006; 35: 230-233.
<https://doi.org/10.1016/j.ejogrb.2005.05.007>
PMid:16054746
4. Sawsan, K. Correlation maternal C-reactive Protein and Serum fibrinogen with the severity of preeclampsia. *kufaMed. Journal.* 2012; 15: 11.
5. Chamberlain, Woloshin S and Schartz LM. Distribution of C-reactive protein values in United States. *N Erigl J med.* 2005; 352(15): 1611-1613.
<https://doi.org/10.1056/NEJM200504143521525>
PMid:15829550
6. MacKay A, Berg C. & Atrash H. Pregnancy related mortality from preeclampsia and eclampsia. *JAMA.* 2001; 282: 356-362.
7. Picklesimer A, Jared H, Moss K, Offenbacher S and Beck J, BK. Racial differences in C-reactive protein level during normal pregnancy. *Am J Obstet Gynecol.* 2008; 199 (5): 523-526.
<https://doi.org/10.1016/j.ajog.2008.04.017>
PMid:18539258 PMcid:PMC2665720
8. Makrina D, Savvidou, Chaistoph C, Lees, Mauro Parra and Aroon, D. Levels of C-reactive protein in pregnant women who subsequently develop preeclampsia. *BJOG.* 2002; 109: 297-301.
[https://doi.org/10.1016/S1470-0328\(02\)01130-8](https://doi.org/10.1016/S1470-0328(02)01130-8)
<https://doi.org/10.1111/j.1471-0528.2002.01130.x>

PMid:11950185

9. Mark B P. C-reactive protein fifty years on. *The Lancet*. 1981; 1: 653-656.

[https://doi.org/10.1016/S0140-6736\(81\)91565-8](https://doi.org/10.1016/S0140-6736(81)91565-8)

PMid:6110874

10. Chunfang Q, Luthy DA, Zhang C, Walsh SW, Leisenring WM & Williams MA. Maternal C-reactive protein concentrations and risk of preeclampsia. *Am J Hypertens*. 2004; 17: 154-160.

<https://doi.org/10.1016/j.amjhyper.2003.09.011>

PMid:14751658

11. Hilary S, Gammill MD, Robert W and Rebecca G et al. Does C-reactive Protein predict recurrent preeclampsia?. *PMC*. 2012; 29 (4): 399-409.

<https://doi.org/10.3109/10641950903214633>

PMid:20701468 PMCID:PMC3339658

12. Bargale A, Jayashree V, Jaanu, Dhiraj J, Trivedi and Nittin Nagane. Serum Hs- CRP and Uric acid as indicator of severity in Preeclampsia. *International Journal of Pharma and Bio Sciences*. 2011; 2 (3): 340-345.

13. Ustun, Yapral Engin-Ustrn and Mansur Kamaci. Associations of Fibrinogen and C-reactive Protein with severity

of preeclampsia. *Eur J Obstet Gynecol Reprod Biol*. 2005; 121: 154-158.

<https://doi.org/10.1016/j.ejogrb.2004.12.009>

PMid:16054955

14. Belo E, Serkan K, and Bulent Y. Association of maternal serum high sensitive CRP level with body mass index and severity of pre-eclampsia at third trimester. *Obstet. Gynecol*. 2005; 36 (5): 970-977.

<https://doi.org/10.1111/j.1447-0756.2010.01279.x>

PMid:20722986

15. Sultana S. Serum C-reactive Protein in preeclampsia. (Thesis) BIRDEM Academy, Dhaka, Library of Dhaka Medical College, Dhaka, Bangladesh. 2010.

16. Nanda K, Sadanand G, Muralidhara, Krishna CS, and Mahadevappa. C-reactive protein as a predictive factor of preeclampsia. *Int. Biol Med Res*. 2012; 8(1): 1307-1310.

17. Kristen K, Wide-Svensson D, Lindstrom V, Schmidt, C, Grubb A. and Strevens H. Serum amyloid a protein and C-reactive protein in normal pregnancy and preeclampsia. *Gynecol Obstet Invest*. 2009; 67(4): 275-80.

<https://doi.org/10.1159/000214081>

PMid:19390201

Outcome of Posterior Lumbar Interbody Fusion (PLIF) with Cage and Bone Graft in The Treatment of Degenerative Lumbar Spinal Canal Stenosis

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Abstract

Introduction: Posterior lumbar interbody fusion (PLIF) is a reliable treatment option for patients with Lumbar canal stenosis & spondylolisthesis; providing spinal stabilization in a balanced alignment with the disc space height restored and with the neural elements being decompressed mechanically. The titanium cages provided immediate stability to spinal levels, restoration of the disc space and neuro-foraminal area, and an increased surface area leading to successful fusion. **Materials and Methods:** This prospective study was carried out at the Department of Orthopedic Surgery at DMCH, Dhaka within the defined period. All the data were compiled and sorted properly and the quantitative data was analyzed statistically by using Statistical Package for Social Science. The results were expressed as percentage and mean $\pm$ SD and $p < 0.05$ was considered as the level of significant. **Result:** Mean age of the study population was 51.32 ± 8.29 with a female: male ratio 1.6 : 1 where maximum patient was housewife (57.14%). 60.72% patients had only single level involvement while 39.28% patients had multi-level involvement. Mean VAS score reduced significantly at final follow-up (6.55 ± 0.66 to 2.29 ± 0.46 for back pain and 6.59 ± 0.65 to 1.21 ± 0.42 for leg pain. Mean ODI score decreased significantly from 56.71 ± 3.09 to 15.82 ± 3.46 at final follow-up. Radiologically Grade-I fusion achieved in 89.28% cases. Overall functional outcome was excellent (89.29%) & good (7.14%) according to Modified Macnab criteria. **Conclusion:** Posterior lumbar interbody fusion (PLIF) with cage and bone graft in the treatment of degenerative lumbar spinal canal stenosis provides excellent neurological and functional outcome and fusion rate at final follow-up.

Keywords: Lumbar canal stenosis, PLIF, Cage, Interbody fusion.

Number of Tables: 08; Number of References: 11; Number of Correspondences: 03.

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Introduction:

Chronic LBP (CLBP) is a syndrome in which there is pain in lower back region, which lasts minimum 12 weeks. Degenerative lumbar spine disorders comprise the major proportion of etiology of chronic low back pain in adult population, which often leads to serious disability to carry out daily routine activities. These conditions are often managed initially using conservative treatment like NSAIDs, rest, muscle strengthening exercises, lumbosacral brace¹. The management options for patients with degenerative lumbar disease have evolved over the decades with variable results of the different options published globally². There are various surgical modalities which have been offered for these conditions like decompression alone, decompression along with posterolateral fusion, and latest technique is decompression with interbody fusion. The current choice for treating lumbar degenerative disease is interbody fusion surgery¹. The idea of lumbar or lumbosacral

arthrodesis is to eliminate motion and thus to relieve pain. Addition of pedicle screw fixation provides direct stability to the spine and improves the fusion rate³. Posterior lumbar interbody fusion (PLIF) is a reliable treatment option for patients with LCS & spondylolisthesis; providing spinal stabilization in a balanced alignment with the disc space height restored and with the neural elements being decompressed mechanically. The titanium cages provided immediate stability to spinal levels, restoration of the disc space and neuroforaminal area, and an increased surface area leading to successful fusion. Additional use of cage in PLIF would provide better biomechanical advantages, including restoration of disc space height, better sagittal alignment, good initial anterior column weight bearing and better fusion rates. Posterior Lumbar Interbody fusion is biomechanically sound as it ablates the degenerated disc, restores the normal intervertebral height and dynamically decompressing foraminal stenosis and positions the bone graft along the weight bearing axis⁴. This technique of 360° fusion is meant to achieve primary stability and prevent segmental movement until bony fusion⁵. Spinal arthrodesis implies fusion of joints around the vertebral disc unit involving articular facets or vertebral interbody region⁶. The objective of spinal fusion surgery is to achieve a solid arthrodesis of spinal segments while restoring disk height, immobilizing the unstable segment and restoring load bearing to anterior structures. Nowadays, both posterior lumbar interbody fusion (PLIF) and transforaminal lumbar interbody fusion (TLIF) have been widely and successfully used in the management of lumbar degenerative diseases⁷. The interbody cage evolved fast in the years that followed, with several variation kinds including titanium cages, and the use of cages in conjunction with locally morcellized bone graft rather than tricortical iliac bone graft became the norm of contemporary treatment⁸.

Materials & Methods:

This Prospective Interventional Study study was carried out among 28 patients attending at the department of Orthopaedic Surgery at Dhaka Medical College Hospital, Bangladesh Spine & Orthopaedic Hospital (BSOH), Al-Manar Hospital Ltd, Dhaka for the treatment of lumbar spinal canal stenosis within the defined period from January 2022 to December 2022. Ethical clearance was obtained from the Institutional Review Board (IRB) of DMCH. Purposive sampling was done according to availability of the patients. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the epidemiology, clinical feature, diagnosis and treatment of the lumbar spinal stenosis patients.

Results:

Mean age of the patients was 51.32 ± 8.29 years and the ranges were 40-70 years where maximum belonged to 40-49 years of age (42.86%) (Table I).

Table I: Distribution of the study patients (n=28)

Age (years)	Number	Percentage
40-49	12	42.86%
50-59	9	32.14%
≥60	7	25%
Total	28	100%

Greater part of the patients was female 60.71% with a female: male ratio 1.6 :1 (Table II).

Table II: Gender distribution of the study population (n=28)

Gender	Number	Percentage
Female	17	60.71%
Male	11	39.29%
Total	28	100%

Average postoperative hospital stay was 5.43 ± 0.79 days which was ranged 5-7 days (Table III).

Table III: Duration of pre-operative & postoperative hospital stays (n=28)

Hospital stay	Mean $\pm$ SD	Range (min-max)
Pre-operative hospital stay (In days)	6.36 ± 6.91	2-20
post-operative hospital stay (in days)	5.43 ± 0.79	5-7

Pre-operatively, mean VAS score (Back pain) of all patients was 6.55 ± 0.66 (6-8) whereas post-operatively VAS score was decreased significantly at final follow up (2.29 ± 0.46) compared to pre-operative status (p value <0.001). Paired t-test was performed comparing preoperative vs final follow-up at 06 months (Table IV).

Table IV: Mean VAS score (Back pain) in study population at (n=28)

Time point	Mean $\pm$ SD	Range (min-max) days
Pre-operative	6.55 ± 0.66	6-8 days
post-operative	2.29 ± 0.46	2-3 days

* p value <0.001

Pre-operatively, mean VAS score (Leg pain) of all patients was 6.59 ± 0.65 (6-8) whereas post-operatively VAS score was decreased significantly at final follow up (1.21 ± 0.42) compared to pre-operative status (p value <0.001). Paired t-test was performed comparing preoperative vs final follow-up at 06 months (Table V)

Table V: Mean VAS score (Leg pain) in study population at (n=28)

Time point	Mean $\pm$ SD	Range (min-max) days
Pre-operative	6.59 ± 0.65	6-8 days
post-operative	1.21 ± 0.42	1-2 days

* p value <0.001

Pre-operatively, mean ODI score of all patients was 56.71 ± 3.09 (52-62) whereas post-operatively ODI score was decreased significantly at final follow up (15.82 ± 3.46) compared to pre-operative status (p value < 0.001). Student t -test was performed comparing preoperative vs final follow-up at 6 months (Table VI).

Table VI: Oswestry Disability Index (ODI) in study population at (n=28)

Time point	Mean $\pm$ SD	Range (min-max) days
Pre-operative	56.71 ± 3.09	52-62
post-operative	15.82 ± 3.46	12-25

*** p value < 0.001**

Radiological outcome was assessed post-operatively by Bridwell grading system. Radiological fusion with remodeling and trabeculae was found in majority patients after 6 months of follow up (89.28%). No patient had experienced non-union (grade IV) during all of the post-operative follow up (Table VII).

Table VII: Assessment according to Bridwell fusion criteria (n=28)

Bridwell grade	After 6 months (n)	Percentage
Grade I	25	89.28
Grade II	3	10.72
Grade III	0	0
Grade IV	0	0

Table VIII shows comprehensive post operative outcome. Most of the cases 25 (89.29%) had excellent outcome, 2 (7.14%) case had good and 1 (3.57%) case had fair outcome.

Table VIII: Distribution of study population according to post operative clinical outcome (n=28)

According to Modified Macnab criteria (Macnab et al., 1971)

Comprehensive outcome	Frequency (n)	Percentage
Excellent	25	89.29
Good	2	7.14
Fair	1	3.57
Poor	00	00

Discussion:

In our study mean age of the patients was 51.32 ± 8.29 years and the range were 40-70 where maximum belonged to 40-49 years of age (42.86%). Similar result was found by Murthy & Reddy (2016) where maximum patients were in the age group of 41-50 years (36.7%) followed by 51-60 years (33.3%)³. In our study greater part of the patients were female 60.71% with a female: male ratio 1.6 :1. Murthy & Reddy (2016) found male 46.7% and female 53.3% which is almost similar to our study³. In our study, pre-operatively, mean VAS score for back pain of all patients was 6.55 ± 0.66 (6-8) whereas post-operatively VAS score was decreased significantly at final

follow up (2.29 ± 0.46) compared to pre-operative status (p value < 0.001). Etemadifar et al. (2016) also found similar result where VAS score of back pain improved significantly ($p=0.37$). Pre-operatively, mean VAS score for leg pain of all patients was 6.59 ± 0.65 (6-8) whereas post-operatively VAS score was decreased significantly at final follow up (1.21 ± 0.42) compared to pre-operative status (p value < 0.001) and it is also similar to Etemadifar et al. (2016)⁹. In our study, average postoperative hospital stay was 5.43 ± 0.79 days which was ranged 5-7 days. Similar result was observed by Xu et al. (2020) in which mean duration of hospital stay after operation was 6.9 ± 1.8 days¹⁰. Regarding ODI score (Oswestry Disability Index), in our study pre-operative mean ODI score of all patients was 56.71 ± 3.09 (52-62) whereas post-operatively ODI score was decreased significantly at final follow up (15.82 ± 3.46) compared to pre-operative status (p value < 0.001) which is significant. Etemadifar et al. (2016) found almost similar result where ODI score decreased significantly ($p=0.53$) from 68 ± 129 . Radiological outcome was assessed post-operatively by Bridwell grading system. Radiological fusion with remodeling and trabeculae was found in majority patients after six months of follow up (89.28%). No patient had experienced non-union (grade IV) during all of the post-operative follow up. Etemadifar et al. (2016) in their study found 68% (PLIF) grade I fusion⁹. In our study, according to Modified Macnab criteria 89.29% patients had excellent clinical outcome. Aziz & Aziz (2022) in their study found almost similar result (84.61%) excellent & good outcome according to Modified Macnab's criteria¹¹. Hossain et al. (2021) in their study found 90% excellent & good result with only 5% non-satisfactory outcome⁴.

Conclusion:

Posterior lumbar interbody fusion (PLIF) with cage and bone graft in the treatment of degenerative lumbar spinal canal stenosis provides excellent neurological and functional outcome and fusion rate at final follow-up.

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Conflict of Interest: None.

References:

1. Saini, R., Jain, M., Sharma, A. et, al. Outcome of posterior lumbar interbody fusion using cage, combined with posterior instrumentation. *International Journal of Orthopaedics*. 2020;6(1):611-615.
<https://doi.org/10.22271/ortho.2020.v6.i1k.1935>
2. Ndubuisi, C.A. et, al. Outcome of posterior lumbar interbody fusion for degenerative lumbar spine spondylolisthesis in a neurosurgical centre in Nigeria. *Nigerian Journal of Medicine*. 2021; 30(3):288.
https://doi.org/10.4103/NJM.NJM_201_20
3. Murthy, H. and Reddy, T.V.S. Short term clinical and

functional outcome after posterior lumbar inter body fusion in cases of lumbar canal stenosis by using RODI score assessment. *Indian Journal of Orthopaedics Surgery*. 2016; 2(3):280-284.

<https://doi.org/10.5958/2395-1362.2016.00051.7>

4. Hossain, M.A., Uddin, M.J., Rahman, M.T., et al. Evaluation of Treatment of Degenerative Disc Disease by Posterior Lumbar Interbody Fusion with Cage and Bone Graft. *IOSR-JDMS*. 2021; 20:51-60.

5. Trouillier, H., Birkenmaier, C., Rauch, A., Weiler, et al. Posterior lumbar interbody fusion (PLIF) with cages and local bone graft in the treatment of spinal stenosis. *Acta orthopaedica belgica*. 2006;72(4):460.

6. Ansari, M. and Ansari, I. Clinical evaluation of lumbar interbody fusion (PLIF/TLIF) done for spondylolisthesis at L4-L5 level. *International Journal of Orthopaedics*. 2019; 5(2):577-582.

<https://doi.org/10.22271/ortho.2019.v5.i2h.58>

7. Lan, T., Hu, S.Y., Zhang, Y.T., et al. Comparison between posterior lumbar interbody fusion and transforaminallumbar interbody fusion for the treatment of lumbar degenerative diseases: a systematic review and meta-analysis. *World neurosurgery*. 2018; 112:86-93.

<https://doi.org/10.1016/j.wneu.2018.01.021>

PMid:29367001

8. Rahman, M.M. Outcome of Fixation of Spondylolisthesis Grade I and Fusion with Bone Graft without Metallic Cage, Experiences in Private Hospitals. *Sch J App Med Sci*. 2021; 10:1591-1594.

<https://doi.org/10.36347/sjams.2021.v09i10.020>

9. Etemadifar MR, Hadi A, Masouleh MF. Posterolateral instrumented fusion with and without transforaminal lumbar interbody fusion for the treatment of adult isthmic spondylolisthesis: A randomized clinical trial with 2-year follow-up. *J Craniovertebr Junction Spine*. 2016 Jan-Mar;7(1):43-9.

<https://doi.org/10.4103/0974-8237.176623>

PMid:27041885 PMCID:PMC4790148

10. Xu, D., Chen, X., Li, Z., et, al. Tranexamic acid reduces hidden blood loss in posterior lumbar interbody fusion (PLIF) surgery. *Medicine*. 2020;99(11).

<https://doi.org/10.1097/MD.00000000000019552>

PMid:32176112 PMCID:PMC7440332

11. Aziz, A.M.A. and Aziz, A.I.A. Short-term functional evaluation of posterior lumbar interbody fusion done for degenerative spondylolisthesis at L4-L5 level. *Journal of Orthopedics, Traumatology and Rehabilitation*. 2020;12(1):17.

https://doi.org/10.4103/jotr.jotr_7_19

Anti-CCP Antibodies in Unaffected First-Degree Relatives of Rheumatoid Arthritis Patient

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Abstract

Introduction: Rheumatoid arthritis (RA) is perhaps the most common inflammatory arthritis, affecting 0.5% to 1% of the general population worldwide. Environmental and genetic influences are important risk factors for pathogenesis of RA. First-degree relatives (FDRs) of RA patients sharing genetic and environmental risk factors for RA may represent as pre-RA state. Since anti-CCP antibody appears years before the onset of RA, it can be used to estimate risk-potential for future development of RA in unaffected FDRs of RA patient. **Objective:** To see the serum anti-CCP antibody in unaffected FDRs of RA patients. **Materials and Methods:** This cross-sectional study was conducted from July 2019 to June 2020 in Department of Biochemistry, Dhaka Medical College, Dhaka. A total number of 50 subjects were selected among which 25 were unaffected FDRs of RA patients and the other 25 were age & gender matched healthy subjects. The related RA patients were selected from Rheumatology outdoor, Department of Rheumatology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka and the healthy subjects were taken from the attendants came to the same institute who did not have RA patient in their family. The key variables (age and gender) were recorded and outcome variable (anti-CCP antibody in study subjects) was estimated. Statistical analysis was done by SPSS 26.0 and the significance was defined as $p < 0.05$. **Results:** Mean age of the FDRs of RA patient was 31.36 ± 10.51 years and that of healthy subjects was 31.56 ± 8.89 years. Most of the participants were in age group 20-29 years followed by 30-39 years. 4% of FDRs of RA patient were anti-CCP antibody positive and no positive case was recorded in healthy subjects. The median level of anti-CCP antibody in FDRs of RA patient was 0.50 U/mL and that in healthy subjects was 0.09 U/mL. The level of significance ($p = 0.002$) showed that serum anti-CCP antibody level was significantly higher (within normal range) in FDRs of RA patient than in healthy subjects, which was even more significant in FDRs of seropositive RA patients. **Conclusion:** This study revealed that serum anti-CCP antibody level was significantly higher (within normal range) in FDRs of RA patient than in healthy subjects and the proportion of positive anti-CCP antibody was more in FDRs of RA patient than in healthy subjects.

Key words: Anti-CCP antibodies, rheumatoid arthritis, first-degree relatives.

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Introduction:

Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by joint swelling, joint tenderness and destruction of synovial joints, leading to severe disability and premature mortality¹. It is perhaps the most common inflammatory arthritis, affecting 0.5% to 1% of the general population worldwide and predominately affects females (2- or 3-fold more often than males). RA can occur at any age but it is more frequent among individuals in the fourth to sixth decades of life². If untreated, 20%–30% of RA patients become so severely debilitated within the first three years following initial diagnosis that they become permanently disabled³.

The precise causes of RA remain uncertain but environmental and genetic influences clearly are factors⁴. Smoking exposure has a dose response relationship with RA risk⁵. Genetic studies have demonstrated that a genetic predisposition resides in the human leukocyte antigen (HLA)-DR locus⁶. In monozygotic twins there is about 15% to 30% concordance rate for rheumatoid arthritis development⁷.

RA is primarily considered as a disease of the joints, but multiple additional organ systems are also known to be involved including pulmonary, cardiovascular, ocular and cutaneous systems⁸.

The initiation of RA begins years before the onset of clinical symptoms. The onset involves certain specific genes that can lead to the production of pathogenic antibodies that bind to modified proteins, help break tolerance, and lead to autoreactivity⁴.

The standard and accepted means of defining RA is by use of classification criteria. This classification was essentially based on the criteria formulated by the American College of Rheumatology (ACR; formerly the American Rheumatism Association) in 1987¹. These criteria exhibit 91%–94% sensitivity and 89% specificity for established RA², but have a significant limitation and are therefore not helpful in achieving the goal of identifying patients who would benefit from early effective intervention¹. A systematic review of publications evaluating the performance of the ACR's 1987 clinical criteria found the sensitivity to early RA to be between 77% and 80%, with specificities between 33% and 77% based on pooled data⁹. To overcome this limitation a joint working group of the American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) was formed and they developed the 2010 ACR/EULAR classification criteria for RA¹.

To meet the need for improved diagnostic and prognostic tests and algorithms, various serum biomarkers are being assessed including a wide range of autoantibodies. However, only rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) have gained wide acceptance⁹.

The first autoantibody in RA, rheumatoid factor (RF), was described by Waaler in 1940, and it was later found to be directed to the Fc region of IgG. IgM RFs are the major RF species in RA and are found in approximately 60%–80% of these patients. It is also found in patients with infections,

other autoimmune diseases, and some unaffected individuals with increasing frequency in older age groups, thus limiting its specificity for RA¹⁰. It is found in 3-5% of the general population, and in up to 30% of the elderly¹¹. Historically, RF was the main element in the serological diagnosis of RA and the only laboratory diagnostic parameter included in the 1987 American College of Rheumatology (ACR) criteria for the classification of RA¹².

Early diagnosis and treatment in RA are crucial as it can prevent disease progression and irreversible joint damage¹³ but RF lacks RA specificity and has a low prevalence in new-onset disease¹⁴. So, anti-citrullinated protein antibodies (ACPAs) have been included in the 2010 ACR/EULAR classification criteria for RA as the second serological marker, which are focused on early diagnosis and therapy¹⁴. ACPAs are locally produced in RA joints, where proteins are citrullinated during the inflammatory process, which are found in 70–90% of RA patients and have high disease specificity (90–95%). Accordingly, they are rarely found in other diseases or in unaffected individuals¹⁰.

The more recent autoantibodies for the diagnosis of RA are anti-cyclic citrullinated peptide antibodies (anti-CCP antibodies). Anti-CCP antibody testing is particularly useful in the diagnosis of RA and it is able to predict the severity of the disease and the irreversible damage¹⁵. It has been shown to be reasonably sensitive (65-80%) and highly specific for RA (up to 98%)¹¹. Due to high specificity and moderate sensitivity, a positive anti-CCP antibody result means RA is likely though a negative result does not rule out the disease¹⁶. There is evidence that the presence of anti-CCP antibodies can be detected long (upto 15 years) before the onset of clinical manifestations which suggests their role in the pathogenesis of RA¹⁷.

The first ACPAs in RA sera were discovered by Nienhuis et al. in 1964, and were named antiperinuclear factor (APF). In 1979, Young et al. reported that RA sera contained antikeratin antibodies (AKA)¹⁸. These antibodies are highly specific for RA (upto 99%), but unfortunately, the inconvenient test format and inconvenient antigenic substrates used to determine the presence of the APF/AKA antibodies have hindered their use as a serological marker¹⁹.

In 1998, Schellekens reported that antibodies, against citrullinated peptide, are highly specific seromarker for the diagnosis as well as prognosis of rheumatoid arthritis³. Schellekens et al. designed a synthetic cyclic citrullinated peptide (CCP) and used it as a new antigenic substrate in anti-CCP ELISA (Enzyme Linked Immunosorbent Assay) to detect ACPAs¹⁴.

The first generation of anti-CCP antibodies (anti-CCP1) test revealed a higher specificity for RA in comparison to the RF test. At the end of 2002, second generation anti-CCP (anti-CCP2) antibodies tests were developed, with different cyclic peptides and improved performance characteristics showing an even better specificity for RA¹².

Several studies have examined the performance characteristics of anti-CCP antibodies in RA, using both the anti-CCP1 and

anti-CCP2 assays. Sensitivity and specificity using the anti-CCP1 assay ranged from 44% to 56% and 90% to 97%, respectively. Detection of antibody with CCP2 assays resulted in improved sensitivity (64–89%), and specificity (88–99%). Rheumatoid factor sensitivity ranged from 59% to 79% and specificity from 80% to 84% in the same groups¹⁸.

Nishimura et al. performed a meta-analysis of published studies regarding the diagnostic accuracy of anti-CCP and RF for rheumatoid arthritis. Their results showed a positive likelihood ratio of 12.46 and a negative likelihood ratio of 0.36 for anti-CCP antibody in patients with RA. The same study showed a positive likelihood ratio of 4.86 and a negative likelihood ratio of 0.38 for RF. These results indicate that anti-CCP positivity alone is more specific than IgM RF for the diagnosis of RA²⁰.

Studies on anti-CCP antibodies in unaffected first-degree relatives of RA patients are very few in Bangladesh. So, the aim of this study was to see the serum anti-CCP antibody in unaffected first-degree relatives of RA patients and compare with those of non-related healthy subjects.

Materials and Methods:

This cross-sectional study was conducted in the Department of Biochemistry, Dhaka Medical College, Dhaka during the period of July 2019 to June 2020. For this study, a total number of 50 subjects between 20-60 years of age were selected, among which 25 were unaffected first-degree relatives (FDRs) of rheumatoid arthritis (RA) patients and the other 25 were age & gender matched healthy subjects. The related RA patients were selected from Rheumatology outdoor, Department of Rheumatology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, and the healthy subjects were taken from the attendants came to the same institute who did not have RA patient in their family. Informed written consent was taken from the study subjects after full explanation of procedure regarding study in a prescribed form. A prefixed questionnaire was used to record detailed history, relevant physical examinations and investigations. After all aseptic precaution 5 ml of venous random blood sample was collected from each study subject. All the biochemical tests were performed in the department of Biochemistry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, estimated by Enzyme-linked Immunosorbent Assay (ELISA) method. All data were recorded in a predesigned data collection sheet. Data was analyzed by using the statistical package for social sciences (SPSS) software version 26.0. Descriptive analysis was performed. Continuous variables were expressed as mean $\pm$ SD or median (IQR) and were compared between groups of subjects by unpaired student's t-test or Mann-Whitney U test. Categorical variables were compared using a Chi-square test or Fischer's exact test as appropriate, and presented as absolute frequencies with percentages. All 'p' values were two-tailed with significance defined as $p < 0.05$ at the level of 95% confidence interval (CI). The results were presented in the form of tables and graphs.

Ethical clearance:

Ethical clearance was obtained from the Ethical Review Committee, Dhaka Medical College, Dhaka with memo no. ERC-DMC/ECC/2020/37 dated 03.02.2020. All the research data were used solely for the study and remained confidential.

Result:

The present study was a cross sectional study, which was conducted in the Department of Biochemistry, Dhaka Medical College, Dhaka. The study was aimed to evaluate the serum anti-CCP antibody in unaffected first-degree relatives (FDRs) of rheumatoid arthritis (RA) patients to compare it with those of healthy subjects. Total study subjects were fifty (50) which were divided into two groups. Group A consists of 25 FDRs of RA patient and Group B consists of 25 healthy subjects. The key variables (age and gender) were recorded and outcome variable (anti-CCPA in study subjects) was estimated. Statistical analysis was done according to the data. Results are presented by tables and figures in the following pages.

Table-I showing demographic profile of the study subjects. There were no significant differences between two groups in terms of mean age and gender distribution.

Table-I: Demographic profile of the study subjects (N=50)

	FDRs of RA patient (n=25)	Healthy subjects (n=25)	p-value
Mean age (years) ± SD (range) years	31.36 ± 10.51 (20-55)	31.56 ± 8.89 (20-55)	0.942 ^a
Gender distribution			
Male, n (%)	16 (64.0%)	14 (56.0%)	0.773 ^b
Female, n (%)	9 (36.0%)	11 (44.0%)	

^aUnpaired t test was done to measure the level of significance

^bChi-Square test was done to measure the level of significance.

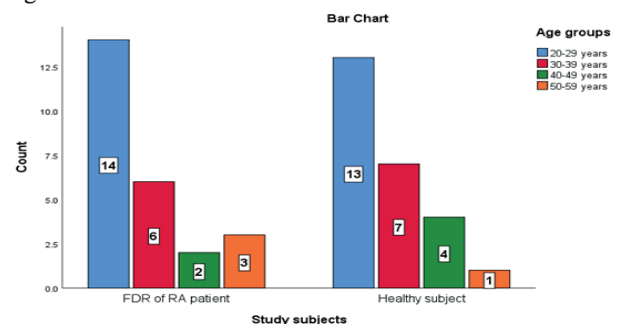


Figure-1: Bar diagram showing distribution of subjects according to their age group.

Maximum participants were in age group 20-29 years in both groups of subjects followed by age group 30-39 years.

Table-II showing that anti-CCP antibody level was significantly higher in FDRs of RA patient than in healthy subjects.

Table-II: Comparison of anti-CCP antibody level between FDRs of RA patients and healthy subjects (N=50).

	FDRs of RA patient (n=25)	Healthy subjects (n=25)	p-value
Anti-CCPA level (U/mL)	0.50 (0.10-0.65)	0.09 (0.08-0.09)	0.002 ^a
Median (IQR)			

^aMann-Whitney U test was done to measure the level of significance

Table-III showing that there was no significant difference in anti-CCP antibody level between male and female.

Table-III: Comparison of anti-CCP antibody level in FDRs of RA patients according to gender (n=25).

	Male FDRs (n=16)	Female FDRs (n=9)	p-value
Anti-CCPA level (U/mL)	0.33 (0.10-0.60)	0.50 (0.10-0.85)	0.598 ^a
Median (IQR)			

^aMann-Whitney U test was done to measure the level of significance

Table-IV showing that 4.0% of FDRs of RA patients were anti-CCPA positive while none of healthy subjects was anti-CCPA positive.

Table-IV: Frequency of anti-CCP antibodies in FDRs of RA patients and healthy subjects (N=50).

	FDRs of RA patients (n=25)	Healthy subjects (n=25)
Anti-CCPA positive, n (%)	1 (4.0%)	0 (0.0%)
Anti-CCPA negative, n (%)	24 (96%)	25 (100%)

Table-V showing that anti-CCP antibody level is significantly higher in FDRs of RF positive patient than in FDRs of RF negative patient.

Table-V: Comparison of anti-CCP antibody level in FDRs of RA patients according to RF in related patient (n=25).

	FDRs of RF positive RA patient (n=22)	FDRs of RF negative RA patient (n=3)	pvalue
Anti-CCPA level (U/mL)	0.50 (0.14-0.73)	0.07 (0.07-0.07)	0.010 ^a
Median (IQR)			

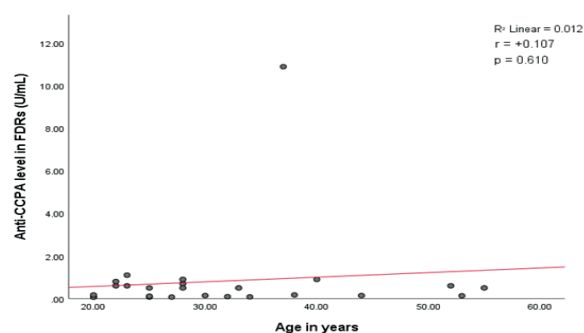
^aMann-Whitney U test was done to measure the level of significance

Table-VI showing that anti-CCP antibody level is significantly higher in FDRs of anti-CCPA positive patient than in FDRs of anti-CCPA negative patient.

Table-VI: Comparison of anti-CCP antibody level in FDRs of RA patients according to anti-CCPA in related patient (n=25).

	FDRs of anti-CCPA positive RA patient (n=19)	FDRs of anti-CCPA negative RA patient (n=6)	pvalue
Anti-CCPA level (U/mL)	0.50 (0.17-0.80)	0.075 (0.07-0.12)	0.010 ^a
Median (IQR)			

^aMann-Whitney U test was done to measure the level of significance

**Figure-2: A positive correlation without significance between the age of the FDRs of RA patients and the anti-CCP antibody level in them.**

Pearson's correlation was done

Figure-2: showing a positive correlation without significance between the age of the FDRs of RA patients and the anti-CCP antibody level in them.

Discussion:

Several studies have revealed that clinically symptomatic rheumatoid arthritis (RA) is preceded by a long period of autoimmunity characterized by the presence of antibodies, elevated cytokine levels, and other markers of inflammation²¹. The factors and mechanism causing initiation of disease are not well understood. Studies of the pre-RA period are useful for understanding the pathogenesis of RA. One way to study pre-RA may be to investigate unaffected first-degree relatives of RA patients, who should share some of the genetic risk and may also share environmental risk factors for RA. Studies on anti-CCP antibodies in unaffected first-degree relatives of RA patients are very few in Bangladesh. No data have been found for the Bangladeshi population regarding pre-clinical autoimmunity, including anti-CCP seropositivity in FDRs of established RA patients prior to the development of RA. So, this cross-sectional study was conducted to see the serum anti-CCP antibody level in unaffected first-degree relatives (FDRs) of RA patients to compare with that of healthy subjects. For this purpose, 25 FDRs of RA patients and another 25 healthy subjects were enrolled as per inclusion and exclusion criteria. In this study mean age of the FDRs of RA patients was 31.36 ± 10.51 years and that of the healthy subjects was 31.56 ± 8.89 years. Minimum age of the study subject was 20 years and the maximum was 55 years in both groups. These results were supported by Smolik et al. (2013)²² where the mean age of FDRs was 35 ± 13 years and that of healthy control was 33 ± 11 years. In current study males were predominant in both groups of subjects. In our sociocultural condition male attendants are usually predominant in outpatient department and our sampling method was purposive and convenient as well, so males were included more in the study. Taking a large sample size enrolled by a random sampling method could overcome this limitation.

This study revealed that FDRs of RA patients have a significantly higher level of anti-CCP antibodies (within normal range). This finding was in agreement with a study done by Årlestig et al. (2011)²³. These finding established that, a positive family history of RA is a risk factor for high titer of anti-CCP antibody in FDRs.

4% of FDRs of RA patients were found to be positive in present study which was comparable to a study done by Kim et al., (2013)²⁴ on 202 FDRs from Korea and found 5% seropositivity for anti-CCP antibody. Earlier and higher expression of RA-related antibodies, especially anti-CCP antibody, may be related to increased risk for RA in the unaffected FDRs of RA patients.

Barra et al. (2013)¹⁷ worked on a Caucasian population from Southwestern Ontario, Canada and found very high prevalence of anti-CCP antibody in FDRs of RA patient (48%). Another study done by Årlestig et al. (2011)²³ on a Caucasian population from Sweden revealed 21.7% anti-CCP positivity in FDRs. Kolfenbach et al., (2009)²⁵ reported anti-CCP positivity in FDRs at a very low rate of 1.7% among the Caucasian population from the US. Another study was done by El-Gabalawy et al. (2009)²⁶ over a North American native population from central Canada which showed 17% of FDRs to be anti-CCP positive. The rate of positive anti-CCP in this study (4%) was comparable to that in a US study (1.7%)²⁵, but much lower than that in other studies.

The differences in the prevalence of ACP antibody in FDRs from the various studies may be due to the characteristics of the study subjects, the assays used, or the study design. It has been evident that RA is much more prevalent in some groups (eg, in Native American groups) and much less prevalent in others (eg, in southern Europe)²⁷. For some unknown reason, in certain parts of the African continent RA has been never found²⁸. This ethnic differences clearly had an effect on different results in different studies.

Conclusion:

In conclusion, this study describes unaffected first-degree relatives (FDRs) of rheumatoid arthritis (RA) patients. It had been found that anti-CCP antibody (anti-CCPA) level was significantly higher (within normal range) in FDRs of RA patient in comparison to healthy subjects, which was even more significant in FDRs of seropositive RA patient. 4% of the FDRs were anti-CCPA positive and none of the healthy subjects was positive for anti-CCPA. Anti-CCPA levels were weakly correlated with age of the FDRs. There was no significant difference in anti-CCPA level between male and female FDRs.

Conflict of Interest: None.

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References:

1. Aletaha D, Neogi T, Silman AJ, Funovits J, Felson DT, Bingham CO, et al. 2010 rheumatoid arthritis classification criteria: An American College of Rheumatology/European League against rheumatism collaborative initiative. *Arthritis & Rheumatism*. 2010 Aug 10;62(9):2569-81. <https://doi.org/10.1002/art.27584> PMID:20872595
2. Henrique da Mota LM, Afonso Cruz B, Viegas Brenol C, Alves Pereira I, Rezende-Fronza LS, Barros Bertolo M, et al. Guidelines for the diagnosis of rheumatoid arthritis. *Revista Brasileira de Reumatologia (English Edition)*. 2013 Mar;53(2):141-57. [https://doi.org/10.1016/S2255-5021\(13\)70019-1](https://doi.org/10.1016/S2255-5021(13)70019-1)
3. Bala K, Kumar N, Rna A, Sharma M, Aggarwal R, Griwan A. Anti-CCP antibody vs rheumatoid factor: A comparison of diagnostic characteristics for rheumatoid arthritis. *International Journal of Current Microbiology and Applied Sciences*. 2018 Oct 10;7(10):1095-9. <https://doi.org/10.20546/ijcmas.2018.710.120>
4. Firestein GS, Gabriel SE, McInnes IB, O'Dell JR. Kelley and Firestein's textbook of rheumatology. 10th ed. Philadelphia, PA: Elsevier; 2017;141-57.
5. Ngian GS. Rheumatoid arthritis. *Australian Family Physician*. 2010 Sept 1;39(9):626-628.
6. Kurkó J, Besenyei T, Laki J, Glant TT, Mikecz K, Szekanecz Z. Genetics of rheumatoid arthritis - a comprehensive review. *Clinical Reviews in Allergy & Immunology*. 2013 Jan 5;45(2):170-9. <https://doi.org/10.1007/s12016-012-8346-7> PMID:23288628 PMCID:PMC3655138
7. Gibofsky A. Overview of epidemiology, pathophysiology, and diagnosis of rheumatoid arthritis. *Am J Manag Care*. 2012 Dec;18(13 Suppl):S295-302.
8. Deane KD, Holers VM. The Natural History of Rheumatoid Arthritis. *Clin Ther*. 2019 Jul;41(7):1256-1269. <https://doi.org/10.1016/j.clinthera.2019.04.028> PMID:31196652
9. Taylor P, Gartemann J, Hsieh J, Creeden J. A systematic review of serum biomarkers anti-cyclic citrullinated peptide and rheumatoid factor as tests for rheumatoid arthritis. *Autoimmune Diseases*. 2011;2011:1-18. <https://doi.org/10.4061/2011/815038> PMID:21915375 PMCID:PMC3170888
10. Song YW, Kang EH. Autoantibodies in rheumatoid arthritis: rheumatoid factors and anticitrullinated protein antibodies. *QJM*. 2010 Mar;103(3):139-46. <https://doi.org/10.1093/qjmed/hcp165> PMID:19926660 PMCID:PMC2825384
11. Miriovsky BJ, Michaud K, Thiele GM, O'Dell JR, Cannon GW, Kerr G, et al. Anti-CCP antibody and rheumatoid factor concentrations predict greater disease activity in men with rheumatoid arthritis. *Annals of the Rheumatic Diseases*. 2010 May 3;69(7):1292-7. <https://doi.org/10.1136/ard.2009.122739> PMID:20439294 PMCID:PMC3122886
12. Vos I, Van Mol C, Trouw LA, Mahler M, Bakker JA, Van

- Offel J, et al. Anti-citrullinated protein antibodies in the diagnosis of rheumatoid arthritis (RA): diagnostic performance of automated anti-CCP-2 and anti-CCP-3 antibodies assays. *Clin Rheumatol*. 2017 Jul;36(7):1487-1492.
<https://doi.org/10.1007/s10067-017-3684-8>
 PMid:28578492 PMCID:PMC5486477
13. Martinez-Prat L, Nissen MJ, Lamacchia C, Bentow C, Cesana L, Roux-Lombard P, et al. Comparison of Serological Biomarkers in Rheumatoid Arthritis and Their Combination to Improve Diagnostic Performance. *Front Immunol*. 2018 Jun 6;9:1113.
<https://doi.org/10.3389/fimmu.2018.01113>
 PMid:29928272 PMCID:PMC5997814
14. Puszczewicz M, Iwaszkiewicz C. Role of anti-citrullinated protein antibodies in diagnosis and prognosis of rheumatoid arthritis. *Arch Med Sci*. 2011 Apr;7(2):189-94.
<https://doi.org/10.5114/aoms.2011.22067>
 PMid:22291756 PMCID:PMC3258718
15. Binesh F, Soleimani Salehabadi H, Behniafard N, Ranginkaman K, Behniafard N. A Comparative Assessment of the Diagnostic Value of Anti-cyclic Citrullinated Peptide Antibodies and Rheumatoid Factor in Rheumatoid Arthritis. *Journal of Clinical & Experimental Pathology*. 2014;4(2):1-5.
<https://doi.org/10.4172/2161-0681.1000158>
16. Braschi E, Shojania K, Allan GM. Anti-CCP: a truly helpful rheumatoid arthritis test? *Can Fam Physician*. 2016 Mar;62(3):234.
 PMID: 26975916; PMCID: PMC4984588.
17. Barra L, Scinocca M, Saunders S, Bhayana R, Rohekar S, Racapé M, et al. Anti-citrullinated protein antibodies in unaffected first-degree relatives of rheumatoid arthritis patients. *Arthritis Rheum*. 2013 Jun;65(6):1439-47.
<https://doi.org/10.1002/art.37911>
 PMid:23450693
18. Niewold TB, Harrison MJ, Paget SA. Anti-CCP antibody testing as a diagnostic and prognostic tool in rheumatoid arthritis. *QJM*. 2007 Apr;100(4):193-201.
<https://doi.org/10.1093/qjmed/hcm015>
 PMid:17434910
19. Schellekens GA, De Jong BA, Van den Hoogen FH, Van de Putte LB, Van Venrooij WJ. Citrulline is an essential constituent of antigenic determinants recognized by rheumatoid arthritis-specific autoantibodies. *J Clin Invest*. 1998 Jan 1;101(1):273-81.
<https://doi.org/10.1172/JCI1316>
 PMid:9421490 PMCID:PMC508564
20. Nishimura K, Sugiyama D, Kogata Y, Tsuji G, Nakazawa T, Kawano S, et al. Meta-analysis: diagnostic accuracy of anti-cyclic citrullinated peptide antibody and rheumatoid factor for rheumatoid arthritis. *Ann Intern Med*. 2007 Jun 5;146(11):797-808.
<https://doi.org/10.7326/0003-4819-146-11-200706050-00008>
 PMid:17548411
21. Kokkonen H, Mullazehi M, Berglin E, Hallmans G, Wadell G, Rönnelid J, et al. Antibodies of IgG, IgA and IgM isotypes against cyclic citrullinated peptide precede the development of rheumatoid arthritis. *Arthritis Res Ther*. 2011 Feb 3;13(1):R13.
<https://doi.org/10.1186/ar3237>
 PMid:21291540 PMCID:PMC3241357
22. Smolik I, Robinson DB, Bernstein CN, El-Gabalawy HS. First-degree relatives of patients with rheumatoid arthritis exhibit high prevalence of joint symptoms. *J Rheumatol*. 2013 Jun;40(6):818-24.
<https://doi.org/10.3899/jrheum.121016>
 PMid:23504380
23. Ärlestig L, Mullazehi M, Kokkonen H, Rocklöv J, Rönnelid J, Dahlqvist SR. Antibodies against cyclic citrullinated peptides of IGG, IGA and IGM isotype and rheumatoid factor of IGM and IGA isotype are increased in unaffected members of multicase rheumatoid arthritis families from northern Sweden. *Annals of the Rheumatic Diseases*. 2011 Nov 29;71(6):825-9.
<https://doi.org/10.1136/annrheumdis-2011-200668>
 PMid:22128080 PMCID:PMC3371219
24. Kim SK, Bae J, Lee H, Kim JH, Park SH, Choe JY. Greater prevalence of seropositivity for anti-cyclic citrullinated peptide antibody in unaffected first-degree relatives in multicase rheumatoid arthritis-affected families. *Korean J Intern Med*. 2013 Jan;28(1):45-53.
<https://doi.org/10.3904/kjim.2013.28.1.45>
 PMid:23345996 PMCID:PMC3543960
25. Kolfenbach JR, Deane KD, Derber LA, O'Donnell C, Weisman MH, Buckner JH, et al. A prospective approach to investigating the natural history of preclinical rheumatoid arthritis (RA) using first-degree relatives of probands with RA. *Arthritis Rheum*. 2009 Dec 15;61(12):1735-42.
<https://doi.org/10.1002/art.24833>
 PMid:19950324 PMCID:PMC2795101
26. El-Gabalawy HS, Robinson DB, Hart D, Elias B, Markland J, Peschken CA, et al. Immunogenetic risks of anti-cyclical citrullinated peptide antibodies in a North American Native population with rheumatoid arthritis and their first-degree relatives. *J Rheumatol*. 2009 Jun;36(6):1130-5. Epub 2009 May 1. PMID: 19411392.
<https://doi.org/10.3899/jrheum.080855>
 PMid:19411392
27. Abdel-Kader Martín N, Cardiel MH. Geographical factors in rheumatoid arthritis. *International Journal of Clinical Rheumatology*. 2011 Jun;6(3):259-61.
<https://doi.org/10.2217/ijr.11.21>
28. Bajraktari IH, Teuta BÇ, Vjollca SM, Bajraktari H, Saiti V, Krasniqi B, et al. Demographic features of patients with rheumatoid arthritis in kosovo. *Med Arch*. 2014 Dec;68(6):407-10.
<https://doi.org/10.5455/medarh.2014.68.407-410>
 PMid:25649180 PMCID:PMC4314179

Comparison the Results of Humerus Shaft Fractures Treated by Functional Bracing versus Dynamic Compression Plate

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Abstract

Introduction with Objective: To compare the results of humerus shaft fractures treated by functional bracing and dynamic compression plate. **Materials and Methods:** This experimental study was carried out at the Department of Orthopedic Surgery at Chittagong Medical College Hospital, Chattogram from August 2019 to July 2021. All adult patients of closed diaphyseal fracture of humerus attending the Orthopaedics department, Chittagong Medical college Hospital during study period were the study population. Purposive sampling was done according to availability of the patients. Cases were divided in two groups; group A (dynamic compression plate) and group B (functional bracing). All the data were compiled and sorted properly and the quantitative data was analyzed statistically by using Statistical Package for Social Science. The results were expressed as percentage and mean $\pm$ SD and $p < 0.05$ was considered as the level of significant. **Result:** Average mean $\pm$ SD age was 40.22 ± 12.451 (range: 19-65) years. The mean age was 37.24 ± 10.686 in plating group and 43.20 ± 13.559 in bracing group. Out of 50 patients, 30 (60%) were male and 20 (40%) were female. Male was predominant in both groups ($P=0.564$). Regarding time taken for radiological union, average mean $\pm$ SD time was 15.32 ± 2.613 (range: 12-22) weeks. The mean time for radiological union was 14.91 ± 2.712 weeks in plating group and 15.76 ± 2.488 weeks in bracing group. Regarding ROM of shoulder & elbow, there was statistically nonsignificant difference found between the groups except shoulder flexion ($P=0.031s$), abduction ($P=0.025s$) & extension ($P=0.041s$) more on plating group. QUICK-DASH score at 3 month shows highly significant difference between the study groups ($p=0.001$). At 6 and 12 month significant difference was found between the groups. Out of 44 patients at 12 months follow-up, 19 (43.2%) patient's functional outcome was excellent and 10 (22.7%) patient's functional outcome was good. Statistically significant difference was found between the groups ($p=0.022$). **Conclusion:** This study observed that functional outcome was relatively better in patients treated by dynamic compression plate in adult diaphyseal fracture of humerus.

Keywords: Dynamic compression plate, functional bracing.

Number of Tables; 04; Number of Figures: 02; Number of References: 12; Number of Correspondences: 04.

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Introduction:

Humerus shaft fractures account for 1 to 3% of all orthopaedic injuries and 20% of all humeral fractures¹. There are several treatment methods for management of humeral shaft fractures

including non operative management by functional brace, open reduction internal fixation (ORIF), minimally invasive plate osteosynthesis, intramedullary nailing and external fixation. Each of these modalities has its own advantages and disadvantages². Historically, nonoperative treatment with a functional brace has been the most popular choice of orthopaedic surgeons for acute isolated closed humeral shaft fractures³. A maximum of 3cm of shortening, 20° angulation and 30° of rotation is acceptable in patients treating with conservative management of humeral shaft fractures⁴. Although functional bracing has been shown to achieve a union rate of nearly 95%, there are some complications of non-operative management like nonunion, malunion, and persistent radial nerve deficit⁵. More recently, however, with the advent of new surgical techniques, implant options and less compliance with conservative management, many orthopaedic surgeons are managing patients operatively⁶. The encouraging results that have been reported with recent advances in internal fixation techniques and the latest instrumentation have led to an expansion of surgical indications for such fractures⁷. The ideal management of closed fractures of the humeral shaft continues to be debatable. Fracture shaft of humerus can be treated by either operative or conservative method. Although most of the fractures of shaft of humerus can be treated conservatively, but with sufficient experienced orthopedic surgeons and well equipped operation theater, we can manage patients operatively also. With this background, the purpose of this study is to determine outcome in patients with diaphyseal fracture of humerus treated with dynamic compression plating and functional bracing.

Materials & Methods:

This experimental study was carried out among 50 patients attending at the Department of Orthopedic Surgery at Chittagong Medical College Hospital, Chattogram from August 2019 to July 2021. All adult patients of closed diaphyseal fracture of humerus attending the Orthopaedics department, Chittagong Medical college Hospital during study period were the study population. Purposive sampling was done according to availability of the patients. In this study, adult patients with diaphyseal fracture of humerus undergoing dynamic compression plating (Group- A) or functional bracing (Group- B) were the study sample. Ethical clearance was obtained from the Institutional Review Board (IRB) of Chittagong Medical College hospital, Chittagong. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to compare the results of humerus shaft fractures treated by functional bracing and dynamic compression plate.

Results:

In present study, average mean $\pm$ SD age was 40.22 ± 12.451 (range: 19-65) years. The mean age was 37.24 ± 10.686 in plating group and 43.20 ± 13.559 in bracing

group. P value was 0.091, statistically non-significant (Table 1).

Table I: Age distribution of the patients (n=50)

Age (years)	Plating		Bracing		Total		P value
	n	%	n	%	n	%	
19-30	7	28	5	20	12	24	0.296 ^{ns}
31-40	10	40	6	24	16	32	
41-50	5	20	6	24	11	22	
50-65	3	12	8	32	11	22	
Mean ± SD	37.24 ± 10.686		43.20 ± 13.559		40.22 ± 12.451		0.091 ^{ns}
Range	21-60		19-65		19-65		

- Statistical analysis was done by Chi-square test and unpaired Student's t-test
- P value > 0.05 indicates non-significant.
- ns= non-significant

Out of 50 patients, 30 (60%) were male and 20 (40%) were female. Male was predominant in both groups (P=0.564).

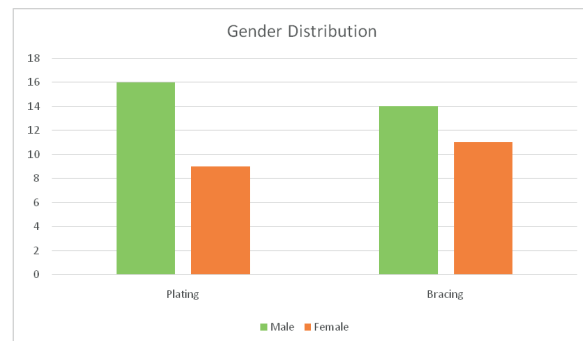


Figure 1: Gender distribution of the study population

Table II shows that regarding time taken for radiological union, average mean $\pm$ SD time was 15.32 ± 2.613 (range: 12-22) weeks. The mean time for radiological union was 14.91 ± 2.712 weeks in plating group and 15.76 ± 2.488 weeks in bracing group. P value was 0.287.

Table- II: Time taken for radiological union (n=43)

Time for radiological union (weeks)	Plating		Bracing		Total		P value
	n	%	n	%	n	%	
12-15	18	78.3	14	66.7	32	72.7	0.583 ^{ns}
16-19	2	8.7	4	19.0	6	13.6	
20-22	3	13.0	2	10.0	5	11.6	
Mean ± SD	14.91 ± 2.712		15.76 ± 2.488		15.32 ± 2.613		0.287 ^{ns}
Range	12-22		12-22		12-22		

- Statistical analysis was done by Chi-square test and Student's t-test.
- P value > 0.05 indicates non-significant
- ns= non-significant
- 7 patients dropped out from study

Table- III shows average mean $\pm$ SD change in shoulder range of motion (flexion, abduction, extension, internal rotation and external rotation) and elbow ROM. According

to P value, result is statistically non-significant between the groups except shoulder flexion, abduction and extension.

Table- III: Shoulder & Elbow Range of Motion at 12th month

Shoulder ROM (degree)	Plating	Bracing	Total	P value
Flexion				
Mean $\pm$ SD	157.18 $\pm$ 8.942	149.91 $\pm$ 12.367	153.55 $\pm$ 11.282	0.031 ^s
Range	130-165	120-168	120-168	
Abduction				
Mean $\pm$ SD	162.55 $\pm$ 12.931	151.59 $\pm$ 17.951	157.07 $\pm$ 16.424	0.025 ^s
Range	120-175	100-175	100-175	
Extension				
Mean $\pm$ SD	54.95 $\pm$ 6.701	49.55 $\pm$ 10.003	52.25 $\pm$ 8.848	0.041 ^s
Range	35-62	30-62	30-62	
Internal rotation				
Mean $\pm$ SD	65.86 $\pm$ 6.643	61.14 $\pm$ 9.667	63.50 $\pm$ 8.539	0.066 ^{ns}
Range	45-72	40-72	40-72	
External rotation				
Mean $\pm$ SD	63.32 $\pm$ 6.992	60.00 $\pm$ 9.861	61.66 $\pm$ 8.613	0.21 ^{ns}
Range	45-70	40-70	40-70	
Elbow ROM (degree)				
Mean $\pm$ SD	127.136 $\pm$ 8.7684	123.091 $\pm$ 11.0450	125.114 $\pm$ 10.0654	0.186 ^{ns}
Range	105-135	85-135	85-135	

- Statistical analysis was done by student t-test.
- P value > 0.05 indicates non-significant; <0.05 indicates significant.

Table IV reveals that, QUICK-DASH score at 3 month shows highly significant difference between the study groups (p=0.001). At 6 and 12 month significant difference was found between the groups.

Table IV: QUICK-DASH score at 6th week (n=50), 3 month (n= 50), 6 month (n= 47) and 12 month (n= 44)

QUICK-DASH score	Plating	Bracing	Total	P value
At 6 week				
Mean $\pm$ SD	36.63 $\pm$ 3.289	38.64 $\pm$ 6.431	37.635 $\pm$ 5.400	0.987 ^{ns}
Range	30-40	35-43.18	30-43.18	
At 3 month				
Mean $\pm$ SD	27.88 $\pm$ 4.986	33.99 $\pm$ 6.500	30.93 $\pm$ 6.513	0.001 ^{hs}
Range	20.45-40.91	22-43.18	20.45-43.18	
At 6 month				
Mean $\pm$ SD	23.10 $\pm$ 7.313	28.12 $\pm$ 8.88	23.22 $\pm$ 9.520	0.032 ^s
Range	11-44	11-43.18	11-43.18	
At 12 month				
Mean $\pm$ SD	9.43 $\pm$ 7.689	15.62 $\pm$ 9.815	12.53 $\pm$ 9.260	0.025 ^s
Range	0-34	0-34	0-34	

- Statistical analysis was done by student t-test.
- P value > 0.05 indicates non-significant; <0.05 indicates significant; <0.005 indicates highly significant
- ns= non-significant; hs= highly significant

Figure 2 shows, out of 44 patients at 12 months follow-up, 19 (43.2%) patient's functional outcome was excellent and 10 (22.7%) patient's functional outcome was good. In Bracing group, 5 (22.7%) patient's functional outcome was excellent and 8 (36.4%) patient's functional outcome was fair and in Plating group, 14 (63.6%) patient's functional outcome was excellent and 5 (22.7%) patient's functional outcome was good. Statistically significant difference was found between the groups (p=0.022).

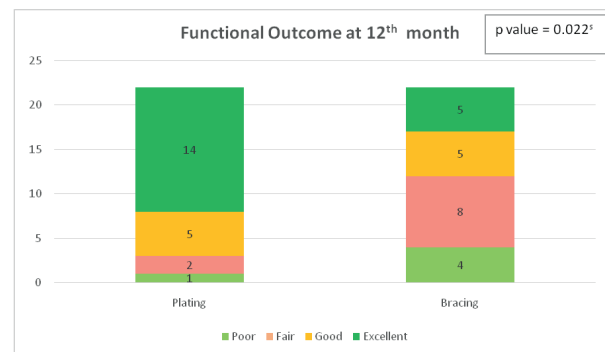


Figure-2: Functional outcome at 12th month (n= 44)

- Statistical analysis was done by Chi-square test.
- P value > 0.05 indicates non-significant and P value < 0.005 indicates significant.
- ns= non-significant and s= significant.

Discussion:

In this study several follow up were done at 6th week, 3rd month, 6th month and 12th month. At 3rd F/U, from Group-A 1 patient & from Group-B 2 patients dropped out from study. At 4th F/U, from Group-A 2 patients & from Group-B 1 patient dropped out from study. The overall functional outcomes were categorized according to Quick DASH Score (Gummesson, Ward and Atroshi, 2006) as excellent, good, fair and poor at 6th week, 3rd month, 6th month & 12th month follow-up⁸. In present study, average mean $\pm$ SD age was 40.22 $\pm$ 12.451 (range: 19-65) years. The mean age was 37.24 $\pm$ 10.686 in plating group and 43.20 $\pm$ 13.559 in bracing group. P value was 0.091, statistically non-significant. Ramo et al. (2020) showed, the mean age was 49.6 $\pm$ 18.2 in plating group and 48.4 $\pm$ 16.2 in bracing group⁹. Mahdi et al. (2019) reported, the mean age was 37.7 $\pm$ 15.4 in plating group and 48.5 $\pm$ 19.4 in bracing group. P value was 0.202 which is statistically non significant¹⁰. Out of 50 patients, 30 (60%) were male and 20 (40%) were female. Male were also predominant in study showed by Ramo et al.(2020) , there were 44 men (54%) and 38 women (46%)⁹.In our study,in plating group 16(64%) patients were male and 9 (36%) patients were

female, in bracing group 14 (56%) patients were male and 11(44%) patients were female($P=0.564$). Mahdi et al.(2019) showed, in plating group, 23 (77%) patients were male and 7 (23%) patients were female, in bracing group 26 (87%) patients were male and 4(13%) patients were female, p value was 0.317¹⁰. Regarding time taken for radiological union, average mean $\pm$ SD time was 15.32 ± 2.613 (range: 12-22) weeks. The mean time for radiological union was 14.91 ± 2.712 (range: 12-22 weeks) weeks in plating group and 15.76 ± 2.488 (range:12-22 weeks) weeks in bracing group. In both groups maximum fractures (72.7%) united between 12 to 15 weeks, p value was 0.287 that is statistically non-significant. Similarly Kumar et al.(2021) showed in both groups maximum fractures(62.5%) united between 13 to 16 weeks and the mean time for radiological union was 15.45 ± 2.864 weeks in plating group and 14.325 ± 3.033 weeks in bracing group¹¹. Sandhu et al (2018) also showed, there was no significant difference in time to union between the two treatment groups, 11.7 ± 2.8 weeks (range, 8-18 weeks) in the plating group and 12 ± 2.6 weeks (range, 8-18 weeks) in the bracing group ($P=0.8659$)¹². In this study functional outcome scores (Quick-Dash score) were better for plating group as compared to bracing group with p -value 0.987, 0.001, 0.032 & 0.025 at 6th week, 3rd month, 6th month and 12th month respectively. In plating group, Mean $\pm$ SD Quick-Dash score was 36.63 ± 289 , 27.88 ± 4.986 , 18.10 ± 7.313 & 9.43 ± 7.689 at 6th week, 3rd month, 6th month and 12th month respectively. In bracing group, Mean $\pm$ SD Quick-Dash score was 38.64 ± 6.431 , 33.99 ± 6.500 , 28.12 ± 8.88 & 15.62 ± 9.815 at 6th week, 3rd month, 6th month and 12th month respectively. Functional outcome scores (DASH score) were also better in plating group in a study showed by Kumar et al (2017), where Mean $\pm$ SD 23.40 $\pm$ 22.87 in plating group and 41.35 $\pm$ 16.32 in bracing group (p value 0.007). In a study Kumar et al.(2021) showed better functional outcome scores in plating group. In plating group, Mean $\pm$ SD DASH score was 40.46 $\pm$ 2.23, 24.82 $\pm$ 77.46, 9.69 $\pm$ 9.85 & 4.25 $\pm$ 6.78 at 8th week, 12 weeks, 24 weeks and 12th month respectively. In bracing group, Mean $\pm$ SD DASH score was 45.77 $\pm$ 26.66, 27.28 $\pm$ 29.98, 18.63 $\pm$ 15.87 & 8.35 $\pm$ 4.67 at 8th week, 12 weeks, 24 weeks and 12th month respectively¹¹. In this study, regarding range of motion of shoulder at 12th month there was no statistically significant difference found between the groups except flexion($P=0.031$), abduction($P=0.025$) & extension($P=0.041$) more in plating group. Elbow ROM (degree) was mean $\pm$ SD, 127.136 $\pm$ 8.7684 in plating group and mean $\pm$ SD, 123.091 $\pm$ 11.0450 in bracing group, the difference was statistically non significant (p value was 0.186). Similarly in a study Sandhu et al. (2018) showed, elbow ROM at fracture union was not significantly different between the 2 groups, average 120.3 degrees vs average 132 degrees in the bracing and plating group, respectively ($P=.5532$)¹². Ramo et al (2020) showed, average elbow ROM (degree) was 143.5 in plating group and 136.8 in bracing group, the difference was statistically non significant (p value was 0.10)⁹.

Conclusion:

This study observed that functional outcome was relatively better in patients treated by DCP in adult diaphyseal fracture of humerus. Regarding other outcome variables, there was no statistically significant difference found between the groups except shoulder flexion($p=0.031$), abduction ($p=0.025$) & extension($p=0.0410$) more on plating group.

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Conflict of Interest: None.

References:

- Ekholm, R., Tidermark, J., Törnkvist, H., et al. Outcome after Closed Functional Treatment of Humeral Shaft Fractures. *Journal of Orthopaedic Trauma*. 2006; 20(9) :591-596
<https://doi.org/10.1097/01.bot.0000246466.01287.04>
PMid:17088659
- Walker, M., Palumbo, B., Badman, B., Brooks, et al. Humeral shaft fractures: a review. *Journal of Shoulder and Elbow Surgery*. 2011; 20(5):833-844.
<https://doi.org/10.1016/j.jse.2010.11.030>
PMid:21393016
- Sarmiento, A., Kinman, P., Galvin, E., et al. Functional bracing of fractures of the shaft of the humerus. *The Journal of Bone & Joint Surgery*. 1977; 59(5):596-601.
<https://doi.org/10.2106/00004623-197759050-00004>
- Perez, E. A. 'Fractures of the shoulder, arm and forearm' In: Azar, F.M., Canale, S.T., Beaty, J.H (eds), *Campbell's operative orthopaedics*, 13th ed., Vol 3, Elsevier, Philadelphia, USA. 2017; 2(A):2951- 2960.
- Papasoulis, E., Drosos, G., Ververidis, A. et al. Functional bracing of humeral shaft fractures. A review of clinical studies. *Injury*. 2010; 41(7):e21-e27.
<https://doi.org/10.1016/j.injury.2009.05.004>
PMid:19523625
- Spiguel, A. and Steffner, R. Humeral shaft fractures. *Current Reviews in Musculoskeletal Medicine*. 2012; 5(3):177-183.
<https://doi.org/10.1007/s12178-012-9125-z>
PMid:22566083 PMCID:PMC3535078
- Gude, N., Kolati, S. and Bonda, Y. Comparative study of functional outcome of dynamic compression plating with interlocking nailing for fracture shaft humerus in adults. *International Archives of Integrated Medicine*. 2019;6(8):102-116.
- Gummesson, C., Ward, M. M. and Atroshi, I. The shortened disabilities of the arm, shoulder and hand questionnaire (Quick DASH): validity and reliability based on responses within the full-length DASH, *BMC Musculoskelet Disord*. 2006; 7: 44.
<https://doi.org/10.1186/1471-2474-7-44>
PMid:16709254 PMCID:PMC1513569
- Rämö, L., Sumrein, B., Lepola, V., et al. Effect of

Surgery vs Functional Bracing on Functional Outcome Among Patients with Closed Displaced Humeral Shaft Fractures. JAMA. 2020; 323(18):1792.

<https://doi.org/10.1001/jama.2020.3182>

PMid:32396179 PMCID:PMC7218498

10. Mahdi, S., Khameneh, H., Abbasian, M., et al. Humeral shaft fracture: a randomized controlled trial of nonoperative versus operative management (plate fixation). Orthopedic Research and Reviews. 2019; 11:141-147.

<https://doi.org/10.2147/ORR.S212998>

PMid:31576178 PMCID:PMC6765056

11. Kumar, B., Kumar, A., Mheshwari, L., et al. Diaphyseal Humeral Fractures Treated by Bracing versus Dynamic Compression Plate. Pakistan Journal of Medical and Health Sciences. 2021; 15(6):1466-1468.

<https://doi.org/10.53350/pjmhs211561466>

12. Sandhu, K., Bakshi, A., Banga, R., et al. Functional outcomes in humeral shaft fractures-Conservative management versus operative procedure. International Journal of Orthopaedics Sciences. 2018; 4(1d):243-246.

<https://doi.org/10.22271/ortho.2018.v4.i1d.36>

Study on Fixation Methods for Metacarpal Bone Fracture

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Abstract

Introduction with Objective: The aim of the present study was to assess the fixation methods for metacarpal bone fracture. **Materials and Methods:** A prospective observational study was conducted from February 2019 to January 2020 among 29 metacarpal bone fracture patients attending at orthopedic surgery department, Chittagong Medical College Hospital, Chittagong after obtaining requisite consent from the patient. Data were collected through the assessment and X-ray report of patients in the orthopedic surgery Department. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the fixation methods for metacarpal bone fracture. **Results:** Most of the study population (89.7%) was in 18-40 years of age group. The mean age of the patients was 33.14 ± 11.895 years (range: 18-70 years). Service was the mostly occurring occupation among the patients (35%) and worker were 31%. In our study transverse fracture was 51.7% and oblique fracture was 41.4%. In case of method of fixation, maximum (65.5%) patient's fixations were done by mini plate, 31% were by K-wire and 3.4% were by both K-wire & lag screw. In case of number of metacarpal bone involvement, 1 bone was involved in maximum (75.9%), 2 bone were involved in 17.2% and 3 bone were involved in 6.9% patients. **Conclusion:** Closed or minimally invasive fixation with K-wire, mini plates and screws are safe methods and can be performed with minimal complications. Maximum (65.5%) patient's fixations were done by mini plate.

Key words: Fixation method, Metacarpal bone fracture.

Number of Tables:04; Number of Figure: 01; Number of References: 10; Number of Correspondences: 04.

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Introduction

Human hand is a specialized structure interacting with the environment and is especially sensitive to functional impairment¹. Hand is a prehensile organ and is endowed with grasping, precision movements for skilled works and act as a chief tactile apparatus. The opposition of thumb to the index finger and other digits is highly evolved in mankind for grasping and finer movements. Thus human hand represents a 'revolution in evolution'. Nowhere in the body, are the forms and function so closely related to each other than in hand. Hence any skeletal injury in hand is likely to alter the function. Fractures of bones of the hand are among the commonest fractures in humans.

Fractures of the metacarpal bones of the hand constitutes approximately 10% of all fractures visits to the hospital following trauma by various means like assault, road traffic accidents, industrial accidents, agricultural accidents^{2,3}. Metacarpal fractures account for 30-40% of all fractures in hand⁴. Though large number of metacarpal fractures can be treated conservatively i.e. close reduction and plaster of paris cast immobilization. But cast immobilization is not very effective in maintenance of reduction and requires prolong immobilization⁵. Numerous indications for operative treatment include mal-rotation, angulation, longitudinally shortening, multiple fractures and fractures with associated soft tissue injuries or bone loss.⁶ various methods of surgical fixation include lag screw alone, plate & screws percutaneous Kirschner wires, external fixator, depending upon fracture type, site and configuration⁷.

Materials & Methods:

A prospective observational study was conducted from February 2019 to January 2020 among 29 metacarpal bone fracture patients attending at orthopedic surgery department, Chittagong Medical College Hospital, Chittagong after obtaining requisite consent from the patient. Data were collected through the assessment and X-ray report of patients in the orthopedic surgery Department. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the fixation methods for metacarpal bone fracture. The study was approved by the institutional ethical committee. After receiving initial treatment, patients were sent to the radiology department for an immediate X-ray. Purposive sampling was used in this study.

Results:

Most of the study population (89.7%) was in 18-40 years of age group. The mean age of the patients was 33.14 ± 11.895 years (range: 18-70 years) (Table I).

Table 1: Distribution of the study patients (n=29)

Age (years)	Number	percentage
18-40	26	89.7%
41-60	1	03.4%
> 60	2	06.9 %

Service was the mostly occurring occupation among the patients (35%) and worker were 31% (Figure I).

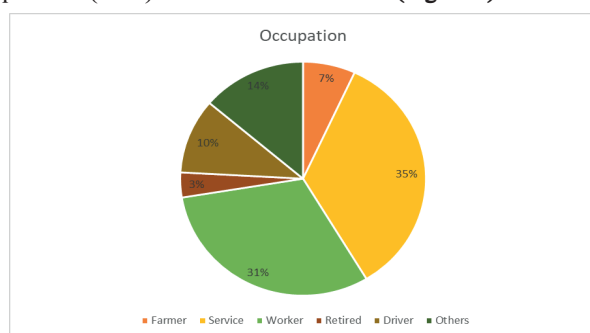


Figure I: Occupation of the patients (n= 29)

In our study transverse fracture was 51.7% and oblique

fracture was 41.4% (Table II).

Table II: Fracture type of the study population (n=29)

Fracture type	Number	percentage
Transverse	15	51.7%
Oblique	12	41.4%
Spiral	01	3.4%
Both transverse & oblique	01	3.4%

In case of method of fixation, maximum (65.5%) patient's fixations were done by mini plate, 31% were by K-wire and 3.4% were by both K-wire & lag screw (Table III).

Table III: Fixation methods of metacarpal bone fracture (n=29)

Fixation methods	Number	percentage
K-wire	09	31%
Mini plate	19	65.5%
Lag screw	0	0%
Both K-wire & Lag screw	01	3.4%

In case of number of metacarpal bone involvement, 1 bone was involved in maximum (75.9%), 2 bone were involved in 17.2% and 3 bone were involved in 6.9% patients (Table IV).

Table IV: Number of metacarpal bone involvement in fracture (n=29)

Number of bone involvement	Number	percentage
1	22	75.9%
2	05	17.2%
3	02	6.9%

Discussion:

In this present study, most of the study population (89.7%) was in 18-40 years of age group. The mean age of the patients was 33.14 ± 11.895 years (range: 18-70 years) (Table I). A recent study by Gupta et al. (2018) described the age distribution of the patients, all the affected patients were in the productive age group of 18-50 years⁸. Another recent study conducted by Reddy and Javali (2017) stated that mean age was 34 years with the range of 19-56 years⁹. Out of 29 patients, all of them were male, may be due to more outdoor activities of the males and hence making them more prone to trauma. Reddy and Javali (2017) found, out of the 15 patients, 12(80%) were male and 3(20%) were females. So men were predominant in all studies⁹. According to occupation, Service was the mostly occurring occupation among the patients (35%) and worker were 31%. A recent study done by Gupta et al. (2018) reported that, Factory laborers were observed to be the most affected group (72%) in their study because maximum patient attending their institute are industrial worker⁸. Regarding type of fracture, in our study transverse fracture

was 51.7% and oblique fracture was 41.4%. Venkatesh and Kerakkanavar (2017) found in their study, the fracture pattern was oblique in 12 patients, transverse in eight, spiral in six, and comminuted in four patients⁷. In the present study, out of 29 cases, in case of number of metacarpal bone involvement, 1 bone was involved in maximum (75.9%), 2 bone were involved in 17.2% and 3 bone were involved in 6.9% patients. A study by Mohanakrishnan (2014) revealed that single metacarpal involvement being the most common accounting for 70% of the cases¹⁰. This present study shows, in case of method of fixation, maximum (65.5%) patient's fixation were done by mini plate, 31% were by K-wire and 3.4% were by both K-wire & lag screw. Four different techniques of fracture fixation were used, depending upon the fracture type, site and configuration. In Gupta et al. 2018 study most of the patients were treated by Open reduction and internal fixation with plates and screws (47%) followed by fixation with screws and kirschner wire⁸.

Conclusion:

Surgical stabilization of metacarpal fractures of the hand seems to give good functional outcome. Closed or minimally invasive fixation with K-wire, mini plates and screws are safe methods and can be performed with minimal complications. Maximum (65.5%) patient's fixations were done by mini plate.

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References:

1. Diaz-Garcia, R. and Waljee, J. F. "Current management of metacarpal fractures". *Hand Clin.* 2013; 29: 507-518. <https://doi.org/10.1016/j.hcl.2013.09.004> PMID:24209950
2. Kamath, J. B., Harsvardhan, Naik, D. M., Bansal, A.

- "Current concepts in managing fractures of metacarpal and phalanges". *Indian J Plast Surg.* 2011; 44(2):203-211. <https://doi.org/10.1055/s-0039-1699505> <https://doi.org/10.4103/0970-0358.85341> PMID:22022030 PMCID:PMC3193632
3. Deshmukh, G., Rocha, S., Shyam, A., Sancheti, P. "Surgical and Functional outcome of metacarpal fracture". *J Medical thesis.* 2014; 2(1):7-10.
4. Dye, T. M. and Gellman, H. *Metacarpal fractures.* Medscape, 2018.
5. Kollitz, K. M., Hammaert, W. C., Vedder, N. B., Huang, J. I. "Metacarpal Fractures: treatment and complications." 2014; 9(1):16-23. <https://doi.org/10.1007/s11552-013-9562-1> PMID:24570632 PMCID:PMC3928373
6. Freeland, A. E., Orbay, J. L. "Extra-articular hand fractures in adults". *Clin Orthop Relat Res.* 2006; 445: 133-45. <https://doi.org/10.1097/01.blo.0000205888.04200.c5> PMID:16505726
7. Venkatesh, R. and Kerakkanavar, S. "Functional Outcome of closed metacarpal shaft fractures managed by low-profile miniplate osteosynthesis: A prospective study". *JOAS.* 2017; 5(2):63-67. https://doi.org/10.4103/joas.joas_45_17
8. Gupta, R., Kumar, K., Rakesh. A prospective study to analyse various methods of surgical fixation of metacarpal & phalangeal fractures. *IJOS.* 2018; 4(2): 658-663. <https://doi.org/10.22271/ortho.2018.v4.i2j.96>
9. Reddy, P. K. and Javali, V. "Metacarpal shaft fracture fixation with intramedullary k-wire: Surgical and Clinical outcomes." *Int J Orth Sciences.* 2017;3(2):222-225. <https://doi.org/10.22271/ortho.2017.v3.i2d.32>
10. Mohanakrishnan, V. "Functional Outcome of Closed Metacarpal Fractures Treated with Mini Fragment Plates and Screws - A Prospective Study. Thesis, Department of Orthopaedics, Madurai Medical College, Madurai." 2014.

Spectrum of Upper Gastrointestinal Endoscopy Findings in Patients with Dyspepsia

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Abstract

Introduction: This retrospective study was designed to see the endoscopic findings in patients with dyspepsia. **Materials and Methods:** This was a hospital-based retrospective observational study which included adult patients who underwent upper gastrointestinal endoscopy for dyspepsia from December 2020 to November 2022. **Result:** Total of 802 patients, male 405 (50.5%) and female 397 (49.5%), age ranging from 14 to 87 years (mean 42.2382 and SD 15.45) were included in this study. Most common abnormal endoscopic finding was non erosive antral gastritis seen in 341 patients (42.5%), followed by pangastritis in 63 (7.86%) and erosive antral gastritis in 52 (6.48%) patients, duodenal ulcer disease including active, with or without outlet obstruction and remission phase 127 (15.82%), gastric ulcer 34 (4.24%) and oesophageal varices 21 (2.62%). In addition, 24 (2.99%), seven (0.87%) and five (0.62%) patients had carcinoma stomach, carcinoma oesophagus and carcinoma duodenum respectively with higher incidence among elderly patients. While, duodenal malignancy and haital hernia were more common in elderly patients, erosive antral gastritis and pangastritis were more common at younger age groups. However, oesophageal varix, duodenal ulcer and antral carcinoma were more common among male patients. **Conclusion:** Gastritis was the most common endoscopic finding among dyspeptic patients. The incidence of upper GI malignancy was low, but comparatively higher in elderly patients.

Key words: Dyspepsia, upper GI endoscopy, gastritis, gastric cancer.

Number of Tables: 04; **Number of References:** 27; **Number of Correspondences:** 03.

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Introduction:

Dyspepsia is a very common upper gastrointestinal (GI) symptom. Dyspepsia literally means difficult digestion. It is not a diagnosis, rather constellation of symptoms localized to upper abdomen like

epigastric pain or burning, abdominal bloating, early satiety, belching, postprandial fullness, nausea, and/or vomiting^{1,2}. The prevalence of dyspepsia is about 20-30% globally. However, studies from the Indian subcontinent approximated it to be nearly 30 to 49%^{3,4}. Dyspepsia may be linked to serious GI pathological conditions like ulcer, stricture or malignancy⁵. An organic cause is found in around 40% of patients with dyspeptic symptoms. If no cause is identified, then dyspepsia is considered to be functional or non-ulcer dyspepsia. The dyspeptic patients are considered to be at high risk if it is new onset with age > 50 years, weight loss, hematemesis, melena, persistent vomiting or dysphagia and family history of cancer⁶⁻⁹. Esophagogastroduodenoscopy (EGD) is an important diagnostic tool for the evaluation of upper gastrointestinal tract. Dyspeptic symptoms are the most frequent reason for requesting for an upper GI endoscopy¹⁰. It is easy, reliable, diagnostically superior with scope of biopsies and/or therapeutic interventions. A negative endoscopy may have a significant reassuring effect and may result in a decreased use of medication, fewer medical consultations, reduction in anxiety and an increase in patients' satisfaction. With this background, this study was undertaken to determine the prevalence of significant endoscopic lesions in patients presenting with dyspepsia^{11,12}.

Materials and Methods:

This was a retrospective observational study that was carried out at a private medical centre in Sylhet, Bangladesh, over a period of 2 years extending from December 2020 to November 2022. Patients

presenting with dyspeptic symptoms lasting more than 3 months and not investigated previously, either endoscopically or radiologically, were included in the study, and their charts were retrieved from our hospital database. Patients who were terminally ill and noncooperative patients, a documented history of the upper gastrointestinal pathology or upper gastrointestinal surgery were excluded from the study.

Statistical analysis

All statistical analyses were performed using SPSS version 25.0. Descriptive statistics were used to characterize patient demographics. Continuous variables were presented as the mean and standard deviation and the categorical data as number and percentage. The continuous variables were compared using the one-way ANOVA, and the categorical variables were analyzed using the Chi-squared test. $P < 0.05$ was considered as statistically significant.

Results:

A total of 802 patients were included in this study. Out of them, male were 405 (50.5%) and female were 397 (49.5%). Mean age was 42.43 years (SD $\pm$ 15.64) and 42.04 years (SD $\pm$ 15.26) for male and female patients respectively (Table I).

Table –I: Distribution of study subjects according to age and sex

Sex	Number	Age range	Mean	SD
Male	405 (50.5%)	14 to 87	42.4346	15.647
Female	397 (49.5%)	14 to 82	42.0378	15.263

The endoscopic findings were normal in 140 patients (17.46%). Most of the pathological endoscopic findings were distributed in stomach followed by duodenum and esophagus (Table II).

Table II: Distribution of endoscopic findings based on site of lesion

Distribution of site of endoscopic findings	Number	Percentage (%)
Normal	140	17.46
Esophagus	73	9.10
Stomach	573	71.44
Duodenum	131	16.33

EGD failed to reveal any significant findings in 140 patients (17.46%). Among those with abnormal endoscopic findings, non erosive antral gastritis was the most common endoscopic abnormality seen in 341 patients (42.5%), followed by pangastritis in 63 (7.86%) and erosive antral gastritis in 52 (6.48%) patients. Other less common endoscopic findings included duodenitis, duodenal ulcer, antral ulcer, oesophageal varix, portal hypertensive gastropathy, oesophageal candidiasis, gastric malignancy, oesophageal malignancy, duodenal malignancy. Again, hiatal hernia were more common in patients above 60 years of age with p value 0.045 and 0.044 respectively. On the other hand, erosive antral gastritis and pangastritis were more common at younger age group (Table III).

Table III: Relation of endoscopic findings with age

Findings	Number	Age up to 25	26-45	26-60	>60	P Value
Male	405 (50.5%)	56 (13.83%)	188(46.42%)	104(25.67)	57(14.07%)	
Female	397 (49.5%)	65 (16.37%)	174(43.83%)	112(28.21%)	46(11.59%)	
Normal	140(17.46%)	39 (27.86%)	69 (49.29%)	23 (16.43%)	9 (6.43%)	0.00
NEAG	341(42.52%)	48 (14.08%)	157(46.04%)	88 (25.81%)	48(14.08%)	0.59
EAG	52 (6.48%)	3 (5.77%)	19 (36.54%)	22 (42.31%)	8 (15.38%)	0.025
Pangastritis	63 (7.86%)	13 (20.63%)	35 (55.55%)	14 (22.21%)	1 (1.59%)	0.017
Gastritis	46 (5.74%)	5 (10.87%)	20 (43.48%)	15 (32.61%)	6 (13.04%)	0.754
Antral ulcer	34 (4.24%)	2 (5.89%)	12 (35.29%)	15 (44.11%)	5 (14.71%)	0.79
DU (remission)	29 (3.62%)	3 (10.34%)	13 (44.82%)	8 (27.59%)	5 (17.24%)	0.78
DU (active)	34 (4.24%)	6 (17.65%)	15 (44.12)	5 (14.71%)	8 (23.53%)	0.14
DU duodenitis)	50 (6.23%)	7 (14.0%)	22 (44.0%)	16 (32.0%)	5 (10.0%)	0.83
DU (GOO)	13 (1.62%)	2 (15.38%)	5 (38.46%)	5 (38.46%)	1 (7.69%)	0.78
Carcinoma antrum	14 (1.74%)	0	4 (28.57%)	4 (28.57%)	6 (42.86%)	0.76
Carcinoma stomach (other)	7 (0.87%)	0	1 (14.29%)	2 (28.57%)	4 (57.14%)	0.70
Oesophageal candidiasis	14 (1.74%)	0	9 (64.29%)	4 (28.57%)	1 (7.14%)	0.30
Oesophagitis	6 (0.75%)	0	5 (83.33)	0	1 (16.67%)	0.106
Oesophageal ulcer	10 (1.25%)	0	2 (20.0%)	6 (60%)	2 (20.0%)	0.109
Carcinoma oesophagus	6 (0.75%)	1 (14.29%)	1 (14.29%)	2 (28.57%)	3 (42.86%)	0.179
Hiatal hernia	13 (1.62%)	0	2 (15.38%)	6 (46.15%)	5 (38.46%)	0.006
Oesophageal varix	21 (2.62%)	1 (4.76%)	6 (28.57%)	8 (38.10%)	6 (28.57%)	0.044
Portal hypertensive gastropathy	16 (1.20%)	1 (6.25%)	8 (50.0%)	5 (31.25%)	2 (12.50%)	0.80
Carcinoma duodenum	5 (0.62%)	0	0	3 (60.0%)	2 (40.0%)	0.045
Inlet patch	3 (0.37%)	0	2 (66.67%)	1 (33.33%)	0	

Detection rate of duodenal ulcer disease, carcinoma oesophagus, carcinoma stomach and oesophageal varices were significantly high among males (Table IV). In between sex pathological endoscopic findings i.e. oesophageal varix ($p=0.001$), duodenal ulcer ($p=0.005$) and antral carcinoma($p=0.03$) were more common among males (Table IV).

Table IV: Relation of endoscopic findings with sex

Findings	Total	Female (%)	Male (%)	P value
Normal	140	100 (71.43%)	40 (28.57%)	0.00
NEAG	341	168 (49.26%)	173 (50.73%)	0.326
EAG	52	23 (44.23%)	29 (55.77%)	0.26
Pangastritis	63	14 (22.22%)	49 (77.78%)	0.00
Antral ulcer	34	14 (41.18%)	20 (58.82%)	0.207
Gastritis	46	18 (39.13%)	28 (60.87%)	0.097
DU remission	30	8 (26.67%)	22 (73.33%)	0.008
DU active	34	9 (26.47%)	25 (73.53%)	0.005
DU duodenitis	50	15 (30.0%)	35 (70.0%)	0.003
DU GOO	13	1 (7.70%)	12 (92.30%)	0.002
Ca antrum	14	3 (21.43%)	11 (78.57%)	0.03
Carcinoma stomach (others)	10	4 (40.0%)	6 (60.0%)	0.48
Oesophageal candidiasis	14	8 (57.14%)	6 (42.86%)	0.38
oeso ulcer	10	5 (50.0%)	5 (50.0%)	0.611
carcinoma oesophagus	7	1 (14.29%)	6 (85.71%)	0.065
Hiatus hernia	13	8 (61.54%)	5 (38.46%)	0.276
Oesophageal varix	21	3 (14.29%)	18 (85.71%)	0.001
Ca duodenum	5	0	5 (100.0%)	0.032

Discussion:

Dyspepsia is a common presenting complaint both to general practitioners as well as to gastroenterologists. The symptoms of dyspepsia overlap with many conditions such as GERD, peptic ulcer disease (PUD), motility disorders, side effects of medications (such as NSAIDs, steroids), irritable bowel

syndrome (IBS), biliary tract disease, pancreatitis, and malignancy. The prevalence of GERD and IBS are higher in patients with dyspepsia compared with patients without dyspepsia^{13,14}. Dyspeptic patients younger than 50 years of age and without alarm features are commonly evaluated either by (1) non-invasive testing for *Helicobacter pylori* (the “test and treat” approach), or (2) an empiric trial of acid suppression, or (3) initial upper GI endoscopy. Alarm features for dyspeptic patients include age > 50 years, upper GI bleeding or iron deficiency anaemia, unexplained weight loss, dysphagia, odynophagia, persistent vomiting, and family history of upper GI malignancy in a first-degree relative. Dyspeptic patients older than 50 years of age or those with alarm features should undergo upper GI endoscopy immediately. Endoscopy should also be considered for patients in whom there is a strong suspicion of malignancy even in the absence of alarm features. Upper GI endoscopy is also useful for differentiating organic dyspepsia from functional dyspepsia¹⁵. The present study was undertaken for evaluating the spectrum of upper GI endoscopic findings in dyspeptic patients. In our study, the mean age was 42.4±15.6 (SD) years (14-87 years) for males and 42.0±15.3 years (14-82 years) for females, which is similar to other studies^{16,17}. The gender ratio of male and female were nearly similar⁹. In the present study, the normal endoscopic finding was seen in about 17% of the cases. Rajendran et al. reported normal endoscopic findings in 18% patients with dyspepsia¹⁶. Another study from Nepal Medical College reported normal findings in 17.87% of patients who underwent EGD for dyspepsia¹⁷. Similar findings were revealed in Wallace et al. and Sanjiv et al^{18,19}. In our study normal endoscopic finding was more common in dyspeptic patients younger than 45 years compared to patients above 45 years (77% vs 23%). This finding is consistent with previous studies of Gado et al²⁰, Lopez et al²¹, Sanjiv et al¹⁹, and Thomson et al²². However Wallace et al. reported that age was significant but weak independent predictor of abnormal endoscopic findings¹⁸. Regarding gender distribution, normal endoscopic finding was more common in female patients in comparison to male patients (71.43% vs 28.57%). This result goes with studies of Jung et al²³. and Sanjiv et al¹⁹ that revealed male gender has increased risk for having endoscopic abnormality. This could be attributed to the social habits of smoking and alcohol, which are more common in men and which also play an important role in the pathogenesis of various gastrointestinal disorders such as gastroesophageal reflux disease, peptic ulcer disease and malignancies of upper gastrointestinal tract. In this study, highest percentage of abnormal endoscopic finding was observed in stomach followed by duodenum and esophagus. Rajendran et al¹⁶ and Yellapu et al²⁴ also reported similar observations. In the current study, most common endoscopic abnormality encountered was gastritis (non erosive antral gastritis, erosive antral gastritis, pangastritis). This was in agreement with the findings of Mubarik et al²⁵, Rajendran et al¹⁶, and

Yellapu et al²⁴. Other common endoscopic abnormality in the present study were gastric ulcer, duodenal ulcer, oesophageal candidiasis, hiatal hernia, oesophageal varix. The number of patients with these lesions was too small to compare with prior published data. Regarding malignancy, gastric carcinoma was more prevalent followed by few cases of esophageal carcinoma. The result was in concordance with the previous study done by Dinesh et al²⁶, Rajendran et al¹⁶, and Yellapu et al²⁴ where they found the high frequency of gastric carcinoma followed by esophageal cancer. Moreover, the present study showed that incidence of upper GI malignancy increases as the age advances. Previous studies also showed that the incidence and risk of gastric malignancy was high after 50 years of age²⁷.

Conclusion:

We can conclude that dyspepsia is a common clinical event in upper GI disorders. The most common endoscopic finding of dyspeptic patients was gastritis. The incidence of upper GI malignancy was low, but higher in elderly patients. The upper GI endoscopy is the best investigation tool for evaluating dyspepsia. Though it is an invasive procedure and involves in huge financial burden, it is justifiable to do upper GI endoscopy in dyspeptic patients specially at old age. Even if endoscopic finding is normal, it can cause reduction in anxiety, an increase in patient satisfaction and reassurance that improve the quality of life.

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References:

1. Talley NJ, Zinsmeister AR, Schleck CD, Melton LJ 3rd. Dyspepsia and dyspepsia subgroups: A population-based study. *Gastroenterology*. 1992; 102:1259-1268. [https://doi.org/10.1016/0016-5085\(92\)90764-P](https://doi.org/10.1016/0016-5085(92)90764-P) PMID:1551533
2. Talley NJ, Fett SL, Zinsmeister AR, Melton LJ 3rd. Gastrointestinal tract symptoms and self-reported abuse: A population-based study. *Gastroenterology*. 1994; 107:1040-1049. [https://doi.org/10.1016/0016-5085\(94\)90228-3](https://doi.org/10.1016/0016-5085(94)90228-3) PMID:7926457
3. Grainger SL, Klass HJ, Rake MO. Prevalence of dyspepsia: the epidemiology of overlapping symptoms. *Postgrad Med J*. 1994; 70 (821):154-161. <https://doi.org/10.1136/pgmj.70.821.154> PMID:8183747 PMCID:PMC2397860
4. Ghoshal UC, Abraham P, Bhatt C. Epidemiological and clinical profile of irritable bowel syndrome in India: report of the Indian Society of Gastroenterology Task Force. *Indian J Gastroenterol*. 2008; 27(1):22-28.
5. Davidson's Principle and practice of medicine. Alimentary

tract and pancreatic disease. Presenting problem in gastrointestinal disease. Dyspepsia. 24th edition: 796-798.

6. Talley NJ, Vakil N. Guidelines for management of dyspepsia. *Am J Gastroenterol*. 2005; 100(10):2324-2337. <https://doi.org/10.1111/j.1572-0241.2005.00225.x> PMID:16181387

7. Robert S Fisher and Henry P parkman. Management of nonulcer dyspepsia. *The New England Journal of Medicine* 1998; 11:1376- 1381. <https://doi.org/10.1056/NEJM199811053391907> PMID:9801400

8. Richter JE. Dyspepsia: organic causes and differential characteristics from functional dyspepsia. *Scand J Gastroenterol Suppl*. 1991; 182:11-16. <https://doi.org/10.3109/00365529109109531> PMID:1896824

9. Ahmed Gado, Basel Ebeid, Aida Abdelmohsen, et al. Endoscopic evaluation of patients with dyspepsia in a secondary referral hospital in Egypt. *Alexandria Journal of Medicine*. 2015; 51:179-184. <https://doi.org/10.1016/j.ajme.2013.09.002> <https://doi.org/10.1016/j.ajme.2013.10.001>

10. Drossman DA, Chang L, Chey WD. Rome IV-functional gastrointestinal disorders: Disorders of gut-brain interaction. *Gastroenterology*. 2016; 150:1257-1261. <https://doi.org/10.1053/j.gastro.2016.03.035> <https://doi.org/10.1053/j.gastro.2016.02.032>

11. Keller J, Layer P. Chronic upper abdominal pain: Diagnostic and therapeutic algorithm (Article in German). *Dtsch Med Wochenschr*. 2015; 140(10):718-722. <https://doi.org/10.1055/s-0041-101692> PMID:25970409

12. Aasma Shaukat, Amy Wang, Ruben D Acosta, et al. ASGE Guidelines The role of endoscopy in dyspepsia. *Gastrointestinal Endoscopy*. 2015; 82(2):227- 232. <https://doi.org/10.1016/j.gie.2015.04.003> PMID:26032200

13. Ford AC, Marwaha A, Lim A, et al. Systematic review and meta-analysis of the prevalence of irritable bowel syndrome in individuals with dyspepsia. *Clin Gastroenterol Hepatol*. 2010; 8:401-409. <https://doi.org/10.1016/j.cgh.2009.07.020> <https://doi.org/10.1016/j.cgh.2010.05.031>

14. Talley NJ. Functional (non-ulcer) dyspepsia and gastroesophageal reflux disease: one not two diseases? *Am J Gastroenterol*. 2013; 108:775-777. <https://doi.org/10.1038/ajg.2013.102> PMID:23644963

15. Sftaukat A, Wang A, Acosta RD, et al. The role of endoscopy in dyspepsia, Prepared By: ASGE standards of

practice committee; American Society for Gastrointestinal Endoscopy. 2015; 82: 0016-5107.

16. Rajendran K, Chidambaranathan S, Sathyanesan J, et al. Spectrum of upper gastrointestinal endoscopy findings in patients with dyspepsia and its relation to alarm symptoms. *International Journal of Medical and Health Research*. 2018; 4:175-177.

17. Shrestha R, Karki S, Pandey B, et al. Upper gastrointestinal endoscopy findings in patient presenting with dyspepsia. *Journal of Patan Academy of Health Sciences*. 2015; 2:19-22. <https://doi.org/10.3126/jpahs.v2i2.20325>

18. Wallace MB, Durkalski VL, Vaughan J, et al. Age and alarm symptoms do not predict endoscopic findings among patients with dyspepsia: a mukticentre database study. *Gut*. 2001; 49(1):29-34. <https://doi.org/10.1136/gut.49.1.29> PMID:11413107 PMCID:PMC1728370

19. Sanjiv M, Khean LG. Clinically Significant Endoscopic Findings in a Multi-Ethnic Population with Uninvestigated dyspepsia. *Dig Dis Sci*. 2012; 57(12):3205-3212. <https://doi.org/10.1007/s10620-012-2256-7> PMID:22688184

20. Gado A, Ebeid B, Abdelmohsen A. Endoscopic evaluation of patients with dyspepsia in a secondary referral hospital in Egypt. *Alex J Med*. 2015; 51(3):179-184. <https://doi.org/10.1016/j.ajme.2013.10.001>

21. Lopez LH, Dibildox M, Ramirez BE, et al. Is endoscopy necessary to initiate medical treatment in primary level medical care patients with not investigated dyspepsia? *Rev Gastroenterol Mex*. 2003; 68(2):100-106.

22. Thomson AB, Barkun AN, Armstrong D, et al. The prevalence of clinically significant endoscopic findings in primary care patients with uninvestigated dyspepsia: the Canadian Adult Dyspepsia Empiric Treatment-Prompt Endoscopy (CADET-PE) study. *Aliment Pharmacol Ther*. 2003; 17(12):1481-1491. <https://doi.org/10.1046/j.1365-2036.2003.01646.x> PMID:12823150

23. Jung HK, Kim SE, Shim KN, et al. Association between dyspepsia and upper endoscopic findings (Article in Korean). *Korean J Gasroenterol*. 2012; 59(4):275-281. <https://doi.org/10.4166/kjg.2012.59.4.275> PMID:22544024

24. Yellapu R, Boda S. pper Gastrointestinal Endoscopic Findings of Patients Presenting with Dyspepsia - A Tertiary Care Centre Experience. *International Journal of Contemporary Medical Research*. 2019; 6(9):2454-2459. <https://doi.org/10.21276/ijcmr.2019.6.9.34>

25. Mubarik M, Bhat FA, Malik GM, et al. Diagnostic yield of upper Glendoscopy and ultrasonography in

Patients of dyspepsia. JK-Practitioner. 2012; 17(4):15-18.
26. Dinesh HN, Shashidhar HB, Prasad V. Endoscopic Evaluation of Patients with Dyspepsia in a Tertiary Care Hospital. IOSR J Dent Med Sci. 2015; 15(10):51-54.
27. Salkic N, Zildzic M, Zerem E, et al. Simple

uninvestigated dyspepsia: Age threshold for early endoscopy in Bosnia and Herzegovina. Eur J Gastroenterol Hepatol. 2009; 21:39- 44.
<https://doi.org/10.1097/MEG.0b013e328308b300>
PMid:19086146

Role of Laparoscopy in Evaluation of Various Blunt Abdominal Trauma

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Abstract

Introduction with Objective: The aim of the present study was to assess the role of laparoscopy in evaluation of various Blunt abdominal trauma (BTA) in tertiary care teaching hospital. **Materials and Methods:** A prospective observational study was conducted from 21st June 2016 to 21st December 2017 among 50 abdominal blunt trauma patients attending at Casualty Block, Dhaka Medical College Hospital, Dhaka, after obtaining requisite consent from the patients attendant. Data were collected through the assessment and investigation report of abdominal blunt trauma patients in the Casualty Department. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the role of laparoscopy in evaluation of various blunt abdominal trauma. **Results:** Most of the patients were from 21-30 years (36%) of age group followed by 11-20 years (32%). The median age of this study population is 27 years. Of the study population, 84% (n=42) were male and 16% (n=8) were female. Male-female ratio was 84:16. In this study, 62% (n=31) of patients underwent only laparoscopy and 38% of patients (n=19%) underwent laparoscopy followed by laparotomy. Perforation of gas containing hollow viscus (94.73%) is responsible for conversion of laparoscopy into laparotomy in patients with blunt abdominal trauma. Among 50 patients 14 patients (28%) developed post operative complications. Rate of wound infection was higher laparoscopy followed by laparotomy (n=11). One patient developed post operative collection following laparoscopy. The accuracy rate is 100% in laparoscopic evaluation of BTA in this study. **Conclusion:** laparoscopy is a useful modality for evaluating and managing hemodynamically stable blunt abdominal trauma patients.

Key words: Laparoscopy, Blunt abdominal trauma (BTA).

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Introduction:

Laparoscopy was first used for a trauma patient in 1956 by Lamy, who observed two cases of splenic injury and later, it was noted that laparoscopy is useful for determining the need for laparotomy¹. Fortunately, the incidence of BAT requiring laparotomy is only 6%². Management of BAT requires an art of resuscitation, early diagnosis and initial evaluation and management then lastly the perfect surgical skill. In BAT most commonly injured organs are liver, spleen, kidney, intestines, pancreas, stomach, urinary bladder and vessels accordingly³. Previously all BAT ended up in laparotomy and managed according to organ injury, however in such cases chances of negative laparotomy were high but, due to research and advances in diagnostic field like USG, FAST, CT scan of abdomen, the chances of negative laparotomy significantly reduced and sometimes managed conservatively⁴. With advent and development of new technology, laparoscopy minimally access surgery (MAS) has gained widespread acceptance as a useful tool in evaluation of the patient with blunt

abdominal injuries⁵. Laparoscopic evaluation of abdominal cavity has been established as sensitive and specific in the trauma setting (sensitivity 94% and specificity 98%)⁶. Unnecessary abdominal exploration in severely injured patients can be reduced by employing urgent laparoscopy in BAT. Hemoperitoneum associated with stable vitals with liver injury, splenic injury, bowel injury, mesenteric injury or bladder injury can be managed very well by means of laparoscopy. Advanced laparoscopic technique including bowel resection and anastomosis, ligation of blood vessels can be utilize in BAT, as good as in elective open surgery⁷⁻¹⁰. One can visualize peritoneal cavity and act expeditiously if needed (i.e. laparotomy, laparoscopic assisted intervention or only observation) at the time of laparoscopy¹¹. Laparoscopy is cost effective, reduces the rate of negative laparotomy, reduces the patient's stay in hospital and mortality and allows early mobilization and resumption of work. The purpose of this study is to evaluate the role of emergency laparoscopy as a modality in BAT.

Materials & Methods:

A prospective observational study was conducted from 21st June 2016 to 21st December 2017 among 50 abdominal blunt trauma patients attending at Casualty Block, Dhaka Medical College Hospital, Dhaka, after obtaining requisite consent from the patients attendant. Data were collected through the assessment and investigation report of abdominal blunt trauma patients in the Casualty Department. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the role of laparoscopy in evaluation of various Blunt abdominal trauma. The study was approved by the institutional ethical committee. After receiving initial treatment, patients were sent to the radiology department for an immediate evaluation of their abdominal visceral injuries by a chest X-ray (erect posteroanterior view), abdominal X-ray (erect and supine), focused abdominal sonography for trauma (FAST), and computed tomography (CT) scan. Purposive sampling was used in this study.

Results:

Most of the patients were from 21-30 years (36%) of age group followed by 11-20 years (32%), 31-40 years (20%), 41-50 years (8%) and >50 years (4%) respectively. The median age of this study population is 27 years (Table I).

Table I: Distribution of the study patients (n=50)

Age (years)	Number	Percentage
11-20	16	32%
21-30	18	36%
31-40	10	20%
41-50	4	8%
≥50	2	4%

On this study predominant was male as shown in pie chart. Of the study population, 84% (n=42) were male and 16% (n=8) were female. Male-female ratio was 84:16 (Figure I).

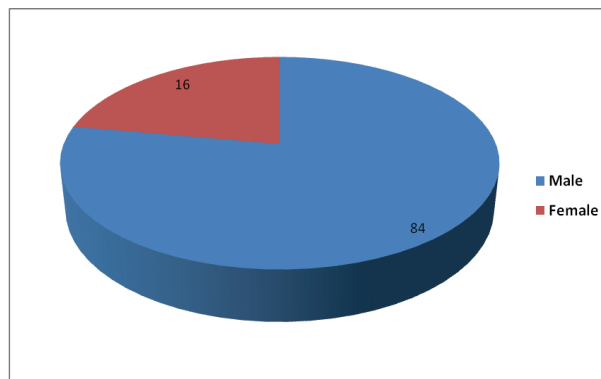


Figure I: Pie chart showing sex distribution of the population (n=50)

In this study, 62% (n=31) of patients underwent only laparoscopy and 38% of patients (n=19) underwent laparoscopy followed by laparotomy.

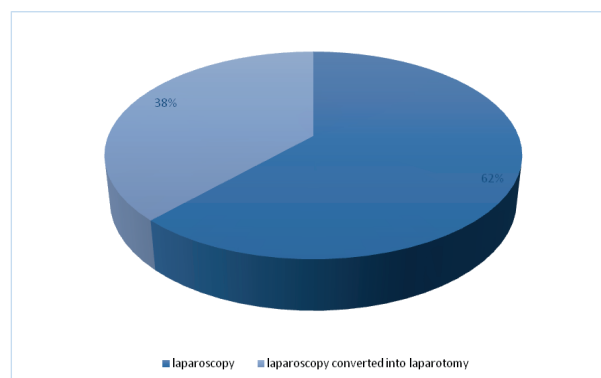


Figure II: Laparoscopy and laparoscopy converted into laparotomy (n=50)

Laparoscopy was classified as negative (6%) if there was no injury, as nontherapeutic (44%) if there was an injury but did not require a surgical intervention, therapeutic (12%) if injury was identified and repaired and positive (38%) if there was an injury that required conversion to open exploration for repair. Among positive (n=19 patients), 14 had small bowel injury, 2 had large bowel injury, 2 had duodenum injury and 1 had uncontrolled bleeding due to mesentery and omental tear (Table II).

Table II: Mode of management in study population (n=50)

Procedure	Number	Percentage
Negative Laparoscopy	3	6%
Non Therapeutic Laparoscopy	22	44%
Therapeutic Laparoscopy	6	12%
Laparoscopy converted into laparotomy	19	38%

Perforation of gas containing hollow viscus (94.73%) is responsible for conversion of laparoscopy into laparotomy in patients with blunt abdominal trauma.

Table III: Reasons for conversion of Laparoscopy into Laparotomy (n=19)

Causes of conversion	Number	Percentage
Perforation of gas Containing hollow Viscus	18	94.73%
Uncontrolled bleeding	1	5.36 %

Post operative complications were high in patients with blunt abdominal trauma with laparoscopy converted into laparotomy. Among 50 patients 14 patients (28%) developed post operative complications. Rate of wound infection was higher laparoscopy followed by laparotomy (n=11). One patient developed post operative collection following laparoscopy and it was managed by USG guided aspiration.

Table IV: Post operative complication following surgery (n=14)

Complication	Laparoscopy	Laparoscopy followed by Laparotomy
Wound infection	0	11
Respiratory complication	0	2
Post operative collection	1	0

In this study total 31 patients out of 50 were managed successfully by laparoscopy without laparotomy. There was no missed injury. Rest of the patients were also diagnosed laparoscopically but required conversion into laparotomy for further definitive management. The accuracy rate is 100% in laparoscopic evaluation of BTA in this study.

Table V: Diagnostic accuracy of laparoscopy in various organ injury.

Type of injury	Number of patients	Diagnosed by laparoscopy	Missed injury	Accuracy rate
Solid organ injury	22	22	0	100%
GIT	18	18	0	100%
Retro peritoneal hematoma	4	4	0	100%
Mesenteric tear	6	6	0	100%
Urinary bladder Injury & Hematoma	3	3	0	100%

Discussion:

The most common affected age group of this study is 21-30 years and median age group is 27 years. Similar finding was found in several studies. VD Gohil, HD Palekar and M Ghoghari¹² study showed the most common age group involved is 11-20 years and 21 -30 years age group respectively. The median age group of their study was 23 years. The median age group in YB Chol et al series¹³ was 40.9 years and in Timothy C Fabian et al series¹⁴ was 32 years. In our country, male are more work outside the home and involved in financial activities, so they are more frequently affected by physical trauma. In this study, maximum 84 % were male and 16% were female with male: female ratio of 84:16 which is a little bit different to sex distribution ratio in VD Gohil et al¹² series which was 76:24. Another study by Morsi Mohamed et al¹⁵ 76.19% were male and 23.81% were female. Another study result, conducted by Muhammad Rafiq Memon et al¹⁶

showed, out of 32 patients 29 were male and 3 were female. In present study, on laparoscopy, 19 (38%) patients had major injuries in whom laparoscopy was converted into exploratory laparotomy. According to the study of VD Gohil et al.¹² only 1 case (4%) was converted into laparotomy due to large single perforation in ileum with large mesenteric hematoma with moderate fecal contamination. In R. Stephen Smith et al.¹⁷ study, only 2 of 90 cases were performed with standard laparoscopy required conversion to laparotomy. Diagnostic accuracy of laparoscopy in this study is 100%, on the other hand in the study of VD Gohil et al.¹² diagnostic accuracy of laparoscopy is 93% and in Hamish Foster et al.¹⁸ it is 89%. In this study, post operative complications were found in 14 patients. Among them 13 patients were undergone laparoscopy converted into laparotomy. Wound infection occurred in 11 patients out of 13. Respiratory complication occurred in 2 patients. Only 1 patient had post operative collection following laparoscopy which was further managed by USG guided aspiration. But there was no complication found in VD Gohil et al.¹² series related to laparoscopic procedure. In YB Cholet al.¹⁴ the complications had occurred only in 3 cases which included wound infection in 1 case, paralytic ileus in 1 and atelectasis in 1 case. The rate of wound infection is more in our study due to excessive crowding in our hospital and lack of 100% aseptic procedures in all steps of patient management.

Conclusion:

Current trends in all areas of surgery are towards minimal invasive techniques. Data shows that laparoscopy is a useful modality for evaluating and managing hemodynamically stable blunt abdominal trauma patients. The ultimate outcome of laparoscopy is very much satisfactory and cost effective to the patient. As technology and expertise among the surgeons continue to improve, more standard therapeutic interventions may be done laparoscopically in future.

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Conflict of Interests:

None.

References:

1. Gazzaniga AB, Slanton WW, Bartlett RH. Laparoscopy in the diagnosis of blunt and penetrating injuries to abdomen. *Am J Surg*. 1996;131:315-8. [https://doi.org/10.1016/0002-9610\(76\)90124-0](https://doi.org/10.1016/0002-9610(76)90124-0) PMID:130806
2. American College of Surgeons. ATLS program for doctors Chicago: First Impressions 1997;193-211.
3. Schwartz's Textbook of principles of Surgery, Trauma. 2005; 8(6):160-78.
4. ANJ. *J Surg Abdominal Trauma: A disease in evaluation*. 2005;35:790-94. <https://doi.org/10.1111/j.1445-2197.2005.03524.x> PMID:16173994
5. Bender JS, Talamini MA. Diagnostic laparoscopy in critically ill intensive care patients. *Surg Endosc*.

- 1992;6:302-4.
<https://doi.org/10.1007/BF02498865>
PMid:1448751
6. Renz BM, Feliciano DV. The length of hospital stay after unnecessary laparotomy for trauma: a prospective study. *J trauma*. 1996; 40:187-190.
<https://doi.org/10.1097/00005373-199602000-00002>
PMid:8637063
7. Textbook of Laparoscopic and Thoracoscopic surgery by CT Frantzides. 1995; 155-71.
8. Lap liver resection Benefits and Controversies. *Surgclin N Am*. 2004; 84: 451-62.
<https://doi.org/10.1016/j.suc.2003.11.002>
PMid:15062655
9. Laparoscopy for abdominal emergencies. *Scan j gastroenterol*. 1995; 202:62-66.
<https://doi.org/10.3109/00365529509107764>
PMid:7777807
10. Diagnostic and therapeutic laparoscopy for trauma. A case report of suturing of intraperitoneal Bladder ruptures in BTA surgical laparoendosc. 2012; 12(3):195-98.
11. Textbook of operative laparoscopy and Thoracoscopy by BV Macfadyen; 1996.
12. VD Gohil et al. Diagnostic and therapeutic laparoscopy in blunt abdominal trauma. *World J of Laparoscopic surgery*. 2009;2(2):42-47.
<https://doi.org/10.5005/jp-journals-10007-1025>
13. YB Chol, et al. Therapeutic laparoscopy for abdominal trauma. *J of Surg Endo*. 2003;17(3):421-27.
<https://doi.org/10.1007/s00464-002-8808-8>
PMid:12457215
14. Timothy C, Fabian, et al: A prospective analysis of laparoscopy in trauma. *Annals of surgery*. 1993;217(5):557-65.
<https://doi.org/10.1097/00000658-199305010-00017>
PMid:8489319 PMCID:PMC1242845
15. http://www.laparoscopyhospital.com/laparotomy_ver-sus_diagnostic_laparoscopy_for_abdominal_trauma.html (viewed on April 2016)
16. Jason Smith, et al. Laparoscopy in pediatric blunt trauma abdomen. A case report, *surg. I endosc*. 2002; 16:358-63.
<https://doi.org/10.1007/s00464-001-4227-5>
PMid:11967698
17. Claudia E. Goettler, Michael R. Bard, Eric A. Toschlog. Laparoscopy in trauma. *Current Surgery*. 2004;61(6):554-59.
<https://doi.org/10.1016/j.cursur.2004.06.017>
PMid:15590019
18. Hamish Foster, Waters, David Ch M. Laparoscopy A useful technique for the general surgeon. *Aust N Z J Surg*. 1988 Jan;58(1):47-50.
<https://doi.org/10.1111/j.1445-2197.1988.tb00967.x>
PMid:2970838

Exploring the Incidence of Malignancy in Thyroid Swelling: A Cross-Sectional Perspective

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Abstract

Introduction: Thyroid malignancy is a global health problem. It is the most common among all endocrine malignancies. The incidence of thyroid cancer is increasing all over the world. Bangladesh is not exempted. The worldwide prevalence of goiter in the general population is estimated at 4-7%. The incidence of malignancy in goitrous thyroid is about 10%. An increased incidence of thyroid carcinoma has been noted in endemic goiter zones. Bangladesh also has some goitrous zones. The frequency of carcinoma is two times higher in solitary thyroid nodules than in multinodular goiter. Male patients with thyroid swelling showed a high incidence of malignancy. **Objective:** The study aims to find out the incidence of malignancy in thyroid swelling in a tertiary level hospital of Bangladesh. **Materials and Methods:** It is a cross-sectional observational study done in the department of ENT & HNS, Cumilla Medical College Hospital from January 2023 to December 2023 with 60 hospitalized patients of different thyroid swelling undergone surgery. **Results:** In this series of 60 patients of thyroid swelling the age of the patients ranged from 15 to 80, the mean age was 37.73. There were 53 females (88.33%) and 07 males (11.66%) with female to male ratio of 7.6:1. Among the non-neoplastic group (n=33;55%) nodular goitre had the highest incidence (n=20;33.33%) followed by multinodular goitre (n=11;18.33%). The incidence of papillary cell carcinoma was predominant. Among 60 patients with thyroid swelling, it was 28.33% (n=17) and among the malignant lesions (n=22) it was 77.27% (n=17). The incidence of malignancy (n=22;36.66%) is more than that of benign (n=5;8.33%). A high incidence of malignancy is observed in male sex. 05 male patients out of 07 were malignant bearing an incidence of 71.42%. In relation to the age of the malignant patients, the incidence is high in 31–40-year group (27.27%). The incidence of malignancy is high in extreme ages also noted. **Conclusion:** The incidence of thyroid malignancy in thyroid swelling is high. Females of middle age are in a risk group and papillary carcinoma is the commonest of all thyroid malignancies. Appropriate medical attention is warranted for early diagnosis and proper management to reduce morbidity and mortality.

Keywords: Thyroid swelling, papillary carcinoma, follicular carcinoma, medullary carcinoma, thyroid cancer.

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Introduction:

The exact incidence of thyroid cancer in Bangladesh is not known but an estimated 2.58% of the 2,629 patients attending the Institute of Post-graduate Medicine and Research (IPGMR, Currently BSMMU) from January 1994 to June 1995 were suffering from thyroid carcinoma¹. Moreover, the incidence of malignancy of solitary thyroid nodules is significantly higher in Bangladesh (18.65%) than in other countries.

Patients presenting to the surgical outpatient department with nodules of the thyroid gland are quite common. About 8% of the adult population has clinically palpable nodules of the Thyroid gland. With advances in imaging techniques, especially high-resolution ultrasonography, the rates of detection of clinically impalpable thyroid nodules have increased manifolds^{3,4,5}.

Thyroid cancer is the most common among all endocrine malignancies³. It accounts for 1% of all malignancy⁴. The worldwide prevalence of goiter in the general population is estimated at 4-7%. The incidence of malignancy in the goitrous thyroid is about 10%⁵. An increased incidence of thyroid carcinoma has been noted in endemic goiter zones^{6,7}. The frequency of carcinoma is two times higher in solitary thyroid nodules than in multinodular goiter. Male patients with solitary thyroid nodules showed a high incidence of malignancy⁸.

A Thyroid nodule can be defined as a palpable lesion or a lesion radiologically distinct from the surrounding normal parenchyma of the gland. Depending on the number, the nodules are classified as either solitary or multiple. The solitary nodule can either be single or can be a dominant nodule in a multinodular gland which cannot be palpated. Solitary nodules occur more frequently in females as compared to males, their prevalence going as far as up to 4 times in the female gender. The nodules can be either asymptomatic and detected on a routine clinical examination or the patient might give a history of a solitary swelling in the front of the neck either of a short duration or more commonly of a longer standing duration.

The exact cause of thyroid cancer is not known but there are a few predisposing factors which favor in genesis of thyroid malignancy, such as age, sex, geographic distribution, familial predisposition, radiation exposure, pre-existent thyroid disease⁹. Differentiated thyroid carcinoma e.g., papillary carcinoma and follicular carcinoma are more common. Both arise from thyroid follicular cell¹⁰. Papillary carcinoma is about 80% among all thyroid malignancies. It occurs in all age groups and is the only thyroid cancer in children¹¹. Follicular carcinoma commonly occurs in older age usually between 50-59 yrs. It accounts for 10-20% of all thyroid malignancies.

Medullary thyroid carcinoma is about 5% of all thyroid malignancies that arise from perifollicular cell (C cell). It may occur as a part of MEN syndrome, as familial NON-MEN disease or it may be sporadic. Anaplastic

carcinoma is common in the elderly. It is more aggressive and has highly metastatic potential¹². Primary thyroid lymphomas are uncommon. Usually, high-grade B cell lymphoma tends to occur in middle-aged and older patients.

Materials and Methods:

It is a cross-sectional prospective observational study done in the department of ENT & HNS, Cumilla Medical College Hospital, Bangladesh from January 2023 to December 2023. The study population are patients with thyroid swelling of different sizes undergone surgery. A total of 60 patients were included. Patients presenting with any thyroid swelling (multinodular or solitary nodule), and patients between 15 to 80 years of age, both male and female gender were included in this study. Cases of thyroiditis, patients with a previous history of head and neck irradiation, pregnant females, and patients unfit for surgery were excluded. Detailed history was taken regarding the presenting history of the swelling and history to trace the etiological causative factors of the swelling. Additionally, past history, history of any co-morbidities, family history of thyroid disease, drug history and other relevant histories were obtained and documented. A detailed general physical, systemic and thyroid swelling examination was done. Furthermore, baseline routine blood investigations as well as specific investigations like thyroid profile, fine needle aspiration cytology (FNAC), X-ray of the neck-anteroposterior and lateral views to look for retrosternal extension in larger swellings, high-resolution USG of the neck, chest X-ray and indirect laryngoscopy to ascertain the condition of the vocal cords was done. Patients who were either in a hypothyroid or hyperthyroid state were made euthyroid by medical therapy before undergoing surgery. All patients underwent surgery, and the histopathological reports were evaluated and correlated with clinical diagnosis by standard statistical methods [SPSS-IBM-version-28.0.0.0(190)]. Different types of surgery were done depending on the indication like total, Hemi, near-total or subtotal thyroidectomy. The study aimed to find out the incidence of malignancy in thyroid swelling irrespective of nodular or multinodular goiter depending on the histopathological report of the surgically removed thyroid tissue.

Results:

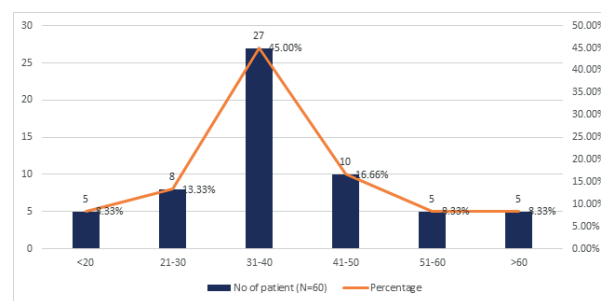


Figure 1: Age distribution among participants

The age of the patients ranged from 15 to 80 years with a mean age of 37.73 yrs.

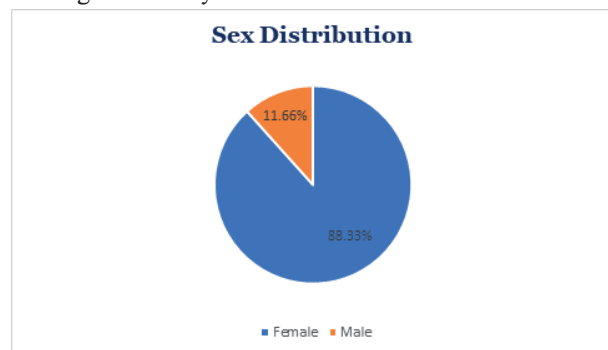


Figure 2: Sex distribution:

The thyroid malignancy is more common in females than males in a ratio of 7.6:1.

Table I: Post-operative histopathology findings: Non-neoplastic.

Histopathology findings	Number of patients(N=60)	percentage
Multinodular goiter	11	18.33%
Nodular goiter	20	33.33%
Hashimoto thyroiditis	02	03.33%
Total	33	55.00%

Among the non-neoplastic lesion's nodular goiter (33.33%) is predominant followed by multinodular goiter (18.33%).

Table II: Post-operative histopathology findings: Neoplastic.

Histopathology findings	Number of patients(N=60)		percentage
	benign	malignant	
Follicular adenoma	03	--	05.00%
Hurthel cell tumor	02	--	03.33%
Follicular carcinoma	--	03	05.00%
Papillary carcinoma	--	17	28.33%
Medullary carcinoma	--	02	03.33%
Total	05	22	45.00%

Among the neoplastic lesions papillary cell carcinoma (28.33%) is predominant followed by follicular adenoma and follicular carcinoma each (05%).

Table III: Histological pattern of malignant lesion

Histological pattern	Number of patients(N=60)	percentage
Papillary carcinoma	17	28.33%
Follicular carcinoma	03	05.00%
Medullary carcinoma	02	03.33%
Total	22	36.66%

Table IV: Malignancy among different age groups

Age in year	Number of malignant patients	Percentage
<20	04	18.18%
21-30	04	18.18%
31-40	06	27.27%
41-50	03	13.63%
51-60	04	18.18%
>60	01	4.54%

Table V: P-value of different variables:

Serial Number	Variables	Group-1	Group-2	Z-value	P-value
1	Sex	Female 53(88.33%)	Male 07(11.67%)	3.56	<0.001
2	Age	<20 years 04(18.18%)	>20 years 56(81.82%)	3.18	<0.001
3	Types of Goiters	Non-neoplastic 33(55%)	Neoplastic 27(45%)	0.39	>0.05
4	Neoplastic	Benign 05(22%)	Malignant 22(78%)	2.93	<0.01
5	Malignant	Papillary Carcinoma 17(77.27%)	Other Carcinoma 05(22.73%)	2.56	<0.05

Discussion:

In this series highest number of patients were in the 31-40 years age group numbering 27 (45%) followed by 10 (16.66%) in the age group of 41-50 years age group with female predominant (**figure I**). This result corroborates with other studies^{13,14,15,16}. The youngest patient in our series was a girl of 15 years, suffering from papillary carcinoma, while the oldest one was a female of 80 years with the same disease. The extreme of ages shows more chance of being malignant^{23,24}. The youngest and oldest patient of our study has been suffering from malignant thyroid disease that corresponds to that study. Females were more predominant in this study than males with a ratio of 7.6:1 (**figure II**) which is a bit higher than other studies^{13,14,15,16}. Md. Iqbal Hossen et al¹³ and Dr. Shanta B et al¹⁷ found the same result of 5.25:1 while Lakshmi YA et al¹⁶ and M A Matin et al¹⁴ found the ratio 4:1 and 3.54:1 respectively. But Hossain MA et al¹⁸ reported the female to male ratio as 7:1 and Babu R et al²² as 8:1 that correspond to our study. Among the 60 patients of our study, 27 patients (45%) were detected neoplastic and 33 patients (55%) were non-neoplastic (**table I, II**). M A Matin et al¹⁴ found the as 66% non-neoplastic and 34% neoplastic in their 200 cases series while Dr. Shanta B et al¹⁷ found as 70% non-neoplastic and 30% of neoplastic in their 50 patients' series. Our result is almost near to their result. Regarding neoplastic lesions 05 (8.33%) patients were benign and 22 (36.66%) patients were malignant among 60 patients. The almost same result shown by M A Matin et al¹⁴ was 2.5% benign and 31.5% malignant. In the present series, papillary cell carcinoma was found to be the highest incidence at 28.33% (n=17) followed by follicular cell carcinoma at 05% (n=03) and medullary cell carcinoma at 3.33% (n=02) each. Papillary cell carcinoma has the highest findings in other series as 29.5%¹⁴, 15%¹⁹, 21.5%²⁰ and 18%²¹. The incidence of malignancy is higher in overall "thyroid swelling" than that of solitary nodules. Our and Matin et al¹⁴ studies show almost the same result as our patients were of "thyroid swelling" irrespective of multinodular or solitary nodular and other studies were on only "solitary nodule". showing low frequency. Among 22 malignant lesions 17 cases (77.27%) were papillary cell carcinoma, 03 cases (13.63%) were

follicular cell carcinoma and 2 cases (09 %) medullary cell carcinoma. More or less the same type of incidence was found in other studies^{13,14,18}. We didn't find any anaplastic carcinoma or lymphoma. Malignant lesion in relation to sex we found 05 male patients out of 07 were malignant bearing an incidence of 71.42%. Of them papillary cell carcinoma 02, follicular cell carcinoma 03 and medullary cell carcinoma 02. We observed incidence of malignancy is almost twice that of females, which is supported by other studies^{13,19,23}. We also observed the male preponderance of medullary carcinoma as our 60 patients' series have only 02 cases of medullary carcinoma and they are all male sex. Incidence of malignancy is higher in extreme ages also noted in our study. Both of our elder and oldest patients were diagnosed with papillary cell carcinoma, and they were both females.

Conclusion:

A remarkable portion of thyroid swelling (35%) underwent surgery was malignant. Females of middle age (31-40 years) were in risk group with papillary carcinoma (28.33%) as the most common pattern. Even if it is too small any thyroid swelling should not be ignored. Appropriate medical attention is warranted for early diagnosis and proper management to reduce morbidity and mortality.

Conflict of Interest: None.

References:

1. Mazumder, et. al. Management of Thyroid Cancer: A Brief Review of Selected Literature, Bangladesh J Otorhinolaryngol. July 2005;05(1): 33-37.
<https://doi.org/10.1383/medc.2005.33.11.35>
2. Huque et. al. Histopathological pattern of malignancy in solitary thyroid nodule. Bangladesh J Otorhinolaryngol. 2012; 18(1): 5-10.
<https://doi.org/10.3329/bjo.v18i1.10407>
3. Yeung MJ, Serpell JW. Management of the solitary thyroid nodule. Oncologist. 2008 Feb 1;13(2):105-12.
<https://doi.org/10.1634/theoncologist.2007-0212>
PMid:18305054
4. Hegedüs L. The thyroid nodule. New Eng J Med. 2004 Oct 21;351(17):1764-71.
<https://doi.org/10.1056/NEJMcp031436>
PMid:15496625
5. Tai JD, Yang JL, Wu SC, Wang BW, Chang CJ. Risk factors for malignancy in patients with solitary thyroid nodules and their impact on the management. J Cancer Res Therapeut. 2012;8(3):379-83.
<https://doi.org/10.4103/0973-1482.103516>
PMid:23174718
6. Unnikrishnan AG, Kalra S, Baruah M, Nair G, Nair V, Bantwal G, et al. Endocrine Society of India management guidelines for patients with thyroid nodules: a position statement. Indian J Endocrinol Metabolism. 2011 Jan;15(1):2.
<https://doi.org/10.4103/2230-8210.77566>
PMid:21584159 PMCID:PMC3079862
7. Usha VM, Sundaram KR, Unnikrishnan AG, Jayakumar RV, Nair V, Kumar H. High prevalence of undetected thyroid disorders in an iodine sufficient adult south Indian population. Journal of the Indian Med Assoc. 2009 Feb;107(2):72-7.
8. Davies L, Welch HG. Increasing incidence of thyroid cancer in the United States. 1973-2002. JAMA. 2006 May 10;295(18):2164-7.
<https://doi.org/10.1001/jama.295.18.2164>
PMid:16684987
9. Gupta M, Gupta S, Gupta VB. Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. J Thyroid Res. 2010; 2010:379051.
<https://doi.org/10.4061/2010/379051>
PMid:21048838 PMCID:PMC2956979
10. Iqbal M, Mehmood Z, Rasul S, Inamullah H, Shah SS, Bokhari I. Carcinoma thyroid in multi and in nodular goiter. J Coll Physicians Surg Pak. 2010; 20:310-2.
11. Anitha S, Ravimohan TR. A study of incidence of malignancy in solitary nodule of thyroid. J Contemp Med Res. 2016;3(4):993-5.
12. Veith FJ, Brooks JR, Grigsby WP, Selenkow HA. The nodular thyroid gland and cancer. A practical approach to the problem. N Engl J Med. 1964 Feb 27; 270:431-6
<https://doi.org/10.1056/NEJM196402272700901>
PMid:14163220
13. Md. Iqbal Hossen, Md. Milon Kazi, Fazle Elahi Jonaed, Kamrun Nahar Hurain, Md. Abdul Hafiz, Suraiya Sharmin Anjum. Pattern of Malignancy in Thyroid Swelling. Bangladesh J Otorhinolaryngol. 2022; 28(1): 78-73.
<https://doi.org/10.3329/bjo.v28i1.60828>
14. M A Matin, Mohammad Saiful Islam, Md. Abdur Razzak, Mohosana Khanam, Md. Abdullah Al Harun, Shahjahan Kabir, et al. Incidence of Thyroid Cancer in Thyroid Swelling, Study of 200 Cases. Bangladesh J Otorhinolaryngol. 2021; 27(1): 12-16.
<https://doi.org/10.3329/bjo.v27i1.53200>
15. Leghari S, Memon GA, Toor HK. Goitre; frequency of malignant diseases in goitre at tertiary care hospital. Professional Med J. 2019; 26(2):450-454.
<https://doi.org/10.29309/TPMJ/2019.26.03.3247>
16. Lakshmi YA, Reddy KVN. A clinicopathological evaluation of solitary nodule in thyroid; a retrospective observational hospital-based study. Int Surg J. 2020; 7:3951-4.
<https://doi.org/10.18203/2349-2902.isj20205366>
17. Dr. Shanta B. Patil and Dr. Deeksha S. Patil. A clinical study of incidence of malignancy in solitary thyroid nodule in a tertiary care hospital. Int. J. Adv. Res. 11(04): 976-981.
<https://doi.org/10.21474/IJAR01/16749>
18. Hossain MA, Sarkar MZ, Dutta UK, Karim MA, Alam MZ. Frequency of Malignancy in solitary Thyroid nodule and Multi-nodular Goitre. Bangladesh J Otorhinolaryngol. 2015

Feb 9;20(2):55-9.

<https://doi.org/10.3329/bjo.v20i2.22019>

19. Abdullah Al Mamun, Zahedul Alam, Mazharul Islam, Mashuque Mahamud, Mizanur Rahman, Mani Lal Aich: Study of Pathological Variations of Solitary Thyroid Nodule; Bangladesh J Otorhinolaryngol. 2018; 24(2): 105-114.

<https://doi.org/10.3329/bjo.v24i2.44154>

20. Hassan A Alzahrani, Malignancy in a Solitary Thyroid Nodule: A Retrospective Histopathological Evaluation: International Journal of General Medicine. 2024;17; 135-140.

<https://doi.org/10.2147/IJGM.S445734>

PMid:38249618 PMCID:PMC10799641

21. Palani V., Reshma S. Original Research Article A clinical study of incidence of malignancy in solitary thyroid nodule in a tertiary care hospital; International Surgery Journal Palani V et al. Int Surg J. 2019 Jan;6(1):293-295.

<https://doi.org/10.18203/2349-2902.isj20185490>

22. Babu R, Shyamala M, Reddy SK. Malignant incidence in solitary nodule thyroid - a clinical study. IJAR. 2015;5(2).

23. Rains AJH, Charles VM. Bailey and Love's short practice of surgery, twenty third ed. London, ELBS; 2004 :707-733.

24. Hard JD. The thyroid gland. Hardy's text book of surgery, First edition: JB Lippincott Company; 1983: 371-93.

Echocardiographic Findings of Patients of Chronic Kidney Disease

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Abstract

Introduction: Reduction in the glomerular filtration rate (GFR) can act as a risk factor for causing cardiovascular abnormalities. Various cardiac abnormalities can complicate chronic kidney disease which range from concentric left ventricular hypertrophy to dilated cardiomyopathy. **Aim:** To enlist the echocardiographic findings of chronic kidney disease patients. **Materials and Methods:** This observational cross-sectional study was conducted in the cardiology unit of Rangpur Medical College Hospital between August 2022 to August 2023. A total of 88 patients of CKD were included in the analysis. Two-dimensional transthoracic echocardiography was done in each patient for LV study. **Results:** The mean age of the patients was 43.32 ± 10.67 years. There was male dominance with male/female ratio 1.9. LV systolic dysfunction was diagnosed in 44%(39/88) of patients, LV diastolic dysfunction in 65.5%(55/88) patients, and concentric left ventricular hypertrophy (LVH) in 68%(60/88) of patients. Also DCM in 17% and IHD and pericardial effusion both in 15% of CKD patients. **Conclusion :** Concentric LVH is the most common structural defect in CKD patients followed by LV diastolic dysfunction, LV systolic dysfunction, Ischaemic heart disease, dilated cardiomyopathy and pericardial effusion.

Keywords: Chronic Kidney Disease.

Number of Tables: 03; Number of Figures: 02; Number of References: 15; Number of Correspondences: 03.

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mL/min/1.73 m² have a 38% higher risk of cardiovascular disease (CVD)¹. CVD in the form of Ischaemic heart disease (IHD) is the leading cause of deaths in CKD patients. Patients of CKD having CVD had three to thirty times higher risk of mortality as compared to the general population². Left ventricular hypertrophy (LVH) specially concentric LVH is one of the common structural cardiac defects in CKD patients³. LV dysfunction both systolic and diastolic dysfunction contributes to LVH. Diastolic dysfunction is more frequent causing increased volume of left atrium. Furthermore, cardiomyopathy may complicate the scenario which may occur due to reduction of coronary perfusion during diastole and chamber enlargement with significant reduction in ejection fraction⁴. Sudden cardiac death among these patients are due to increase excitability. Two dimensional echocardiography is a standard diagnostic tool for the assessment of chamber dimensions and LV systolic and diastolic function^{5,6}.

Materials and Methods:

This Cross-sectional study was conducted in the department of Cardiology, Rangpur Medical College Hospital, Rangpur from August 2022 to August 2023. Sample size was 88. Inclusion criteria were all patient of CKD diagnosed by nephrology department of Rangpur Medical College and Hospital, Rangpur and send for echocardiography in cardiology department were included in this study. Exclusion criteria were known case of Valvular heart disease, congenital heart disease, primary cardiomyopathy and known case of coronary artery disease prior to diagnosis of CKD. Method was all patients who met the inclusion criteria was enrolled in the study after obtaining written informed consent. Detailed physical examination

Introduction:

Chronic kidney disease (CKD) leads to reduction of renal blood flow and GFR which thereafter causes cardiac abnormalities. CKD patients with GFR ≤ 59

was performed in all cases. Transthoracic Echocardiography was done in all patient and all standard aqoustic window were observed. LV systolic function was measured by Ejection fraction using Teicholz method. LV diasolic function was measured by Mitral pulse wave Doppler and Tissue Doppler indices. Regional wall motion was assessed in standard views. Data was analyzed by SPSS software.

Result:

This table shows baseline data of study population . Mean age for the study group was 43.32 ± 10.67 year.

Table I: Baseline data of Study Population(n=88)

Variable	Mean $\pm$ SD
Age (year)	43.32 $\pm$ 10.67
Weight(kg)	68.7 $\pm$ 27.24
Serum creatinine(mg/dl)	4.8 $\pm$ 1.9
Hb(gm)	7.2 $\pm$ 1.4
Urban area(%)	52.3%%

Data was expressed as Mean $\pm$ SD

This Pie chart showing male predominance in study population. Among total 88 patient 58 patients were male (66%) and 30 patients were female (34%). Male and female ratio was 1.9.

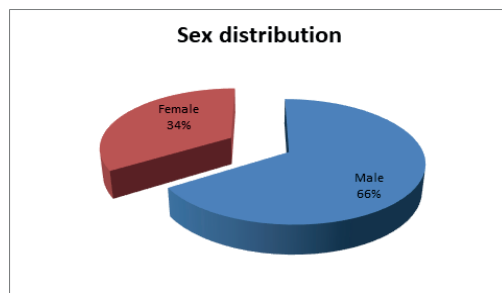


Fig 1: Sex distribution in study population

This table shows different clinical presentation of study population. Majority patients presented with Edema and respiratory distress. 62% patient were hypertensive and 71% were anaemic.

Table II: Distribution of clinical presentation in study population (n=88)

Clinical presentation	Percentage
Edema	80.5%
Respiratory distress	78.4%
Oliguria	53.2%
Hypertension	62.7%
Anaemia	71.6%
Chest pain	48.6%

Table III : Echocardiographic data(n=88)

Variable	Mean $\pm$ SD
IVSd(mm)	15.1 $\pm$ 9.3
LVPWd(mm)	15.9 $\pm$ 8.7
LVIDd(mm)	43.8 $\pm$ 13.6
EF(%)	52.1 $\pm$ 19.4
E/A ratio	0.9 $\pm$ 0.5
E/e'	10.4 $\pm$ 3.8

IVSd=Inter ventricular septum thickness in diastole,

LVPWd=Left ventricular posterior wall thickness in diastole, LVIDd= Left ventricular internal dimension in diastole, EF=ejection fraction

Mean EF was 52.1 ± 19.4 % and mean IVSd and LVPWd was increased.

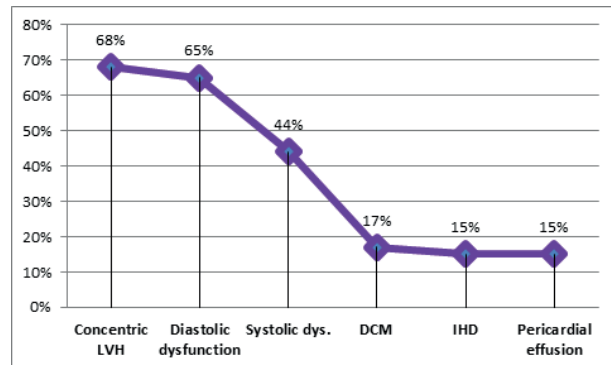


Fig-2: Echocardiographic findings in CKD patients

LV systolic dysfunction was diagnosed in 44%(39/88) of patients, LV diastolic dysfunction in 65.5%(55/88) patients, and concentric left ventricular hypertrophy (LVH) in 68%(60/88) of patients.

Discussion:

Anaemia and hypertension are two key factor for development of cardiac defect in CKD patients as they changes LV dimension and mass index along with LV volume as well as systolic and diastolic function^{7,8}. In this study 62% patient were hypertensive and 71% were anaemic. A study by Tsilonis et al. reported hypertension in 22% of patients of CKD patients on HD⁹. Most common structural defect was concentric left ventricular hypertrophy (LVH) in 68% followed by LV diastolic dysfunction in 65.5%, LV systolic dysfunction in 44%, DCM in 17%, IHD and pericardial effusion in 15%. A study conducted by Jameel F et al 2020 described LV dysfunction was diagnosed in 31% of patients, LV diastolic dysfunction in 47% patients, and left ventricular hypertrophy (LVH) in 55% of patients. There were 39% hypertensive and 62% anemic patients¹⁰. LV dysfunction is an initial precursor of CVD and leads to LVH in the follow-up period. Cardiomyopathy among CKD patients is due to the presence of coronary artery obstruction, reduction in coronary reserves, and left ventricular physiological-structural abnormalities secondary to volume and pressure overload¹⁰. Many other studies have observed similar findings. Some are listed below:

Shivendra et al.	LVH in 48% of patients, diastolic dysfunction in 51.42% patients, and systolic dysfunction in 28.57% patient ¹¹
Agarwal et al.	LV diastolic dysfunction in 53.2% patients and LV systolic dysfunction in 30% of patients ⁴
Laddha et al.	LVH in 74.3% patients, LV diastolic dysfunction in 61.4% patients, and systolic dysfunction in 24.3% patients ¹²
Ahmed et al.	LVH in 80% of patients, LV diastolic dysfunction in 53.3% patients, and LV systolic dysfunction in 36.3% patients ¹³

McIntyre CW et al and Siqueira TMA et al	LV systolic dysfunction in almost all patients but they used the positron emission tomography scan ^{14,15}
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Conclusion:

Concentric LVH is the most common structural defect in CKD patients followed by LV diastolic dysfunction, LV systolic dysfunction, Ischaemic heart disease, dilated cardiomyopathy and pericardial effusion

Reference:

1. Manjunath G, Tighiouart H, Ibrahim H, et al. Level of kidney function as a risk factor for atherosclerotic cardiovascular outcomes in the community. *J Am Coll Cardiol.* 2003;41:47-55.
[https://doi.org/10.1016/S0735-1097\(02\)02663-3](https://doi.org/10.1016/S0735-1097(02)02663-3)
PMid:12570944
2. Muntner P, Judd SE, Gao L, et al. Cardiovascular risk factors in CKD associate with both ESRD and mortality. *J Am Soc Nephrol.* 2013;24:1159-1165.
<https://doi.org/10.1681/ASN.2012070642>
PMid:23704285 PMCid:PMC3699822
3. Parfrey PS, Foley RN, Harnett JD, Kent GM, Murray DC, Barre PE. Outcome and risk factors for left ventricular disorders in chronic uraemia. *Nephrol Dial Transplant.* 1996;11:1277-1285.
<https://doi.org/10.1093/ndt/11.7.1277>
<https://doi.org/10.1093/ndt/11.7.1328>
PMid:8672023
4. Agarwal S, Dangri P, Kalra OP, Rajpal S. Echocardiographic assessment of cardiac dysfunction in patients of chronic renal failure. *J Indian Acad Clin Med.* 2003;4:296-303.
5. McAlister FA, Ezekowitz J, Tonelli M, Armstrong PW. Renal insufficiency and heart failure: prognostic and therapeutic implications from a prospective cohort study. *Circulation.* 2004;109:1004-1009.
<https://doi.org/10.1161/01.CIR.0000116764.53225.A9>
PMid:14769700
6. Gori M, Senni M, Gupta DK, et al. Association between renal function and cardiovascular structure and function in heart failure with preserved ejection fraction. *Eur Heart J.* 2014;35:3442-3451.
<https://doi.org/10.1093/eurheartj/ehu254>
PMid:24980489 PMCid:PMC4810804
7. El Arbagy AR, Koura MA, El Barbary HS, Abou El Nasr AE. Comparative study of the effect of high-flux versus low-flux dialysis membranes on metabolic abnormalities in

chronic hemodialysis patients. *Menoufia Med J.* 2014;27:677-682.

<https://doi.org/10.4103/1110-2098.149667>

8. Hayashi SY, Rohani M, Lindholm B, et al. Left ventricular function in patients with chronic kidney disease evaluated by colour tissue Doppler velocity imaging. *Nephrol Dial Transplant.* 2005;21:125-132.

<https://doi.org/10.1093/ndt/gfi075>

PMid:16221719

9. Tsilonis K, Sarafidis PA, Kamperidis V, et al. Echocardiographic parameters during long and short interdialytic intervals in hemodialysis patients. *Am J Kidney Dis.* 2016;68:772-781.

<https://doi.org/10.1053/j.ajkd.2016.06.017>

PMid:27545351

10. Jameel FA, Junejo AM, Khan QUA, Date S, Faraz A, Rizvi SHM, et al. Echocardiographic Changes in Chronic Kidney Disease Patients on Maintenance Hemodialysis. *Cureus.* 2020 Jul 2;12(7):e8969

<https://doi.org/10.7759/cureus.8969>

11. Shivendra S, Doley PK, Pragya P, Sivasankar M, Singh VP, Neelam S. Echocardiographic changes in patients with ESRD on maintenance hemodialysis-a single centre study. *J Cardiovasc Dis Diagn.* 2014;2:4.

<https://doi.org/10.4172/2329-9517.1000165>

12. Laddha M, Sachdeva V, Diggikar PM, Satpathy PK, Kakrani AL. Echocardiographic assessment of cardiac dysfunction in patients of end stage renal disease on haemodialysis. *J Assoc Physicians India.* 2014;62:28-32.

13. Ahmed HA, Yassein YS, Zaki SA, Al Qersh AM, Fahim FS. Study of echocardiographic changes among adult patients on maintenance hemodialysis. *Menoufia Med J.* 2016;29:44-51.

<https://doi.org/10.4103/1110-2098.178949>

14. McIntyre CW, Burton JO, Selby NM. Hemodialysis-induced cardiac dysfunction is associated with an acute reduction in global and segmental myocardial blood flow. *Clin J Am Soc Nephrol.* 2008;3:19-26.

<https://doi.org/10.2215/CJN.03170707>

PMid:18003765 PMCid:PMC2390980

15. Siqueira TMA, Ferreira PAM, Monteiro FDC Jr, et al. Echocardiographic parameters as cardiovascular event predictors in hemodialysis patients [Article in Spanish]. *Arq Bras Cardiol.* 2012;99:714-723.

<https://doi.org/10.1590/S0066-782X2012005000065>

PMid:22766916

Epidemiological Features of Chronic Low-Back Pain

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Abstract

Introduction: Chronic low back pain (LBP) is a major cause of abstinence from work in the world. **Objective:** The aim of the present study was to assess the epidemiological features of chronic low back pain patients in tertiary care teaching hospital. **Materials and Methods:** A descriptive cross sectional study was conducted from January 2018 to June 2018 among 70 patients attending at Physical Medicine and Rehabilitation outpatient department of the Shaheed Suhrawardy Medical College and Hospital after obtaining requisite consent from the patients. Data were collected through interviewing of the patients. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the epidemiological features of chronic low back pain patients. **Results:** In a pool of 70 patients, most of the patients (n=34, 48.5%) belong to 31-40 year age group. In a pool of 70 patients, Male patients (52.85%) were more than the female patients (47.14%) at the Shaheed Suhrawardy Medical College and Hospital. In occupational status, most of the patients were Housewife (n=19, 27.14%) followed by service-holder (n=17, 24.28%). In a pool of 70 patients, most of the patients BMI were normal (n=49, 70%). **Conclusion:** Epidemiological features were characterized by male patients, as from the 31-40 years of life and housewife. Physical functional profile was primarily characterized by patients with normal BMI and overweight.

Keywords: Epidemiological feature, Chronic low back pain.

Number of Tables: 03; **Number of Figure:** 01; **Number of References:** 10; **Number of Correspondences:** 03.

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Introduction

Low back pain (LBP) is a frequent cause of disability in population, with up to 80% sufferers describing at least one recurrence¹. Nonspecific or mechanical LBP is characterized by the absence of structural change; that is, there is no disc space reduction, nerve root compression, bone or joint injuries, marked scoliosis or lordosis that may lead to back pain. Only 10% of LBP has a specific cause due to a particular disease². The incidence of nonspecific LBP is higher in workers subjected to heavy physical exertion, such as weight lifting, repetitive movements, and frequent static postures³. Chronic low back pain persists for at least 3-6 months, and it may recur in intervals rather than maintaining a continuous presence and it might interrupt functioning, well-being, and quality of life⁴. Chronic LBP is an everyday experience for 4% to 7% of the population⁵. Low back pain usually is a self-limiting and benign disease that tends to improve spontaneously over time⁶.

Materials and Methods:

A descriptive cross sectional study was conducted from January 2018 to June 2018 among 70 patients attending at Physical Medicine and Rehabilitation outpatient department of the Shaheed Suhrawardy Medical College and Hospital after obtaining requisite consent from the patients. Data were collected through interviewing of the patients. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the epidemiological features of chronic low back pain patients. The study was approved by the institutional ethical committee. The interviews were held directly in the corridor just outside the Outpatient Department.

Results:

The table shows that the age structures of those patients have been categorized in years into three groups. Overall, 27 (38.5%) patients were in 18-30 years old while 34 (48.5%) patients were in 31-40 years old. 9 (12.8%) patients belong to above 40 years age group (Table I).

Table I: Age distribution of the study population (n=70)

Age in years	Number	Percentage
18-30 years	27	38.5%
31-40 years	34	48.5%
Above 40 years	9	12.8%

Total numbers of patients both male and female were 70. Male patients (52.85%) were more than the female patients (47.14%) at the Physical Medicine and Rehabilitation outpatient department (Figure 1).

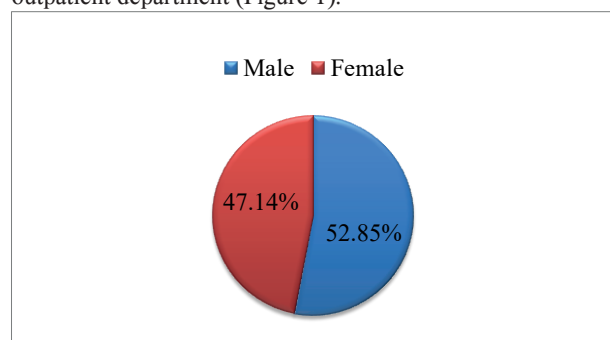


Figure 1: Pie Chart Showing Sex of the Patients

Out of 70 patients, 19 (27.14%) were housewife, 17 (24.28%) were service-holder followed by 6 (8.57%) were driver (Table II).

Table II: Occupational status of the study population (n=70)

Occupational status	Number	Percentage
Housewife	19	27.14%
Garment worker	5	7.14%
Teacher	2	2.85%
Driver	6	8.57%
Businessman	5	7.14%
Service holder	17	24.28%
Laborer	2	2.85%
Student	4	5.71%
Rickshaw puller	1	1.42%
Others	9	12.85%

Out of 70 patients, 6 (8.57%) patients were underweight, 49 (70%) patients were normal BMI, 13 (18.57%) patients were overweight, 2 (2.85%) patients were obese (Table III).

Table III: BMI status of the study population (n=70)

BMI status	Number	Percentage
Underweight (<18.5)	6	8.57%
Normal (18.5-24.9)	49	70%
Overweight (25.0-29.9)	13	18.57%
Obese (30.0- 34.9)	2	2.85%

Discussion:

All together a total of 70 prescriptions were collected during the study period. In our study most of the patients belonged to 31-40 years (48.5%). Near to similar results were obtained in the study conducted by bento et al. 2019 study⁷. In their study they stated most of the patients were 36-59 years (32.7%). This study showed male patients were more than the female patients which were 52.85% and 47.14% respectively. Dissimilar results were obtained in the study conducted by Galukande et al. 2005 study⁸. YiXiang Jet al⁹, demonstrated that females had higher prevalence of LBP across all age groups. In our study most of the patients were housewife (27.14%) followed by service-holder (24.28%). Dissimilar results were obtained in the study conducted by Santos et al. 2015 study¹⁰. In their study they stated most of the patients were industrial production worker (25.2%). In our study most of the patients were Normal BMI (52.5%) and overweight (28.75%). Dissimilar results were obtained in the study conducted by Santos et al. 2015 study. In their study they stated that most of the patients were overweight (57.1%)¹⁰.

Conclusion:

Epidemiological features were characterized by male patients, as from the 31-40 years of life and housewife. Physical functional profile was primarily characterized by patients with normal BMI and overweight. A larger study is needed to explore these hypotheses further.

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Conflict of Interests: None.

References:

- Airaksinen O, Brox JI, Cedrashi C, Hildebradt J, Klaber-Moffett J, Kovacs F, et al. Chapter 4. European guidelines for the management of chronic nonspecific low back pain. *Eur Spine J.* 2006;15:192-300.
<https://doi.org/10.1007/s00586-006-1072-1>
PMid:16550448 PMCID:PMC3454542
- Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *Jama.* 1992;268(6):760-765.

<https://doi.org/10.1001/jama.1992.03490060092030>

PMid:1386391

3. Andrade SC, Araújo AG, Vilar MJ. Escola de Coluna: revisão histórica e sua aplicação na lombalgia crônica. *Rev Bras Reumatol.* 2005;45(4):224-248.

<https://doi.org/10.1590/S0482-50042005000400006>

4. Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. *Spine J.* 2008;8(1):8-20.

<https://doi.org/10.1016/j.spinee.2007.10.005>

PMid:18164449

5. Von Korff M, Crane P, Lane M, Miglioretti DL, Simon G, Saunders K, et al. Chronic spinal pain and physical-mental comorbidity in the United States: results from the national comorbidity survey replication. *Pain.* 2005;113:331-9.

<https://doi.org/10.1016/j.pain.2004.11.010>

PMid:15661441

6. Waddell G. A new clinical model for the treatment of low back pain. *Spine.* 1987;12:632-44.

<https://doi.org/10.1097/00007632-198709000-00002>

PMid:2961080

7. Bento, T.P. et al. Low back pain and some associated factor: Is there any difference between gender. *Brazilian journal of physical therapy.* 2019; 24(1):79-87.

<https://doi.org/10.1016/j.bjpt.2019.01.012>

PMid:30782429 PMCID:PMC6994312

8. Galukande, M. et al. Aetiology of low back pain in mulago hospital, Uganada. *African health science.* 2005; 5(2): 164-167.

9. Yi Xiáng J. Wáng, and Zoltán Káplár. Increased low back pain prevalence in females than in males after menopause age: evidences based on synthetic literature review *Quant Imaging Med Surg.* 2016 Apr; 6(2): 199-206.

<https://doi.org/10.21037/qims.2016.04.06>

PMid:27190772 PMCID:PMC4858456

10. Santos, et al. Sociodemographic and physical function profile of low back pain patients assisted in manaus-AM. *Rev Dor. Sao Paulo.* 2015; 16(4):272-275.

<https://doi.org/10.5935/1806-0013.20150055>

Evaluation of Iatrogenic Genitourinary Fistula after Major Gynaecological Operation in Patient Group Admitted in BSMMU

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Abstract:

Introduction: Close proximity of urinary tract and genital systems in females poses potential risk of fistulas formation during surgical interventions. Gynaecological malignancy, bleeding, prolonged surgery, the presence of active infection during operation, endometriosis, large uterus, previous pelvic operation, pelvic adhesions and myoma uteri are major predisposing factors that may increase the risk of urological injuries & genitourinary fistulas. Genitourinary fistulas result in continuous or intermittent urinary incontinence and a significant public health issue with negative physical, emotional and social impacts on individuals. **Materials and Methods:** This cross sectional observational study was conducted in Department of Obstetrics & Gynaecology, Bangabandhu Sheikh Mujib Medical University, Dhaka, from 27th March 2017 to 26th September 2017. The sample was collected by purposive sampling technique. The study subjects were women with iatrogenic fistula (diagnosed after a clinical examination and investigations) attended in out-patients or in-patients department. **Result:** Mean age of patients was 32.5 ± 9.54 years. Vesicovaginal fistula was commonest cause for iatrogenic genitourinary fistula, present in 34 patients. Ureterovaginal fistula was 10 patients and 6 patients detected urethrovaginal. Aetiological factors revealed that, 46.0% occurred during vaginal hysterectomy, 18.0% due to abdominal hysterectomy, 20.0% due to laparotomy with salpingoophorectomy and 16.0% during laparotomy with cystectomy. **Conclusion:** The commonest urogenital fistula is the vesicovaginal fistula. Urinary leakage following gynaecological surgery is a dreaded complication due to the formation of urogenital fistula. Thorough evaluation, using all diagnostic tools for complete diagnosis, understanding the pathophysiology and choosing the best surgical procedure are mandatory to obtain good outcomes after the surgical procedures.

Key words: Genitourinary Fistula, Gynaecological Operation, Iatrogenic Genitourinary Fistula.

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Introduction:

An iatrogenic genitourinary fistula (IGUF) is an

abnormal communication between the urinary tract and the genital tract, resulting from a surgical procedure. Iatrogenic genitourinary fistulas are typically caused during cesarean section (CS), ruptured uterus repair, hysterectomy for ruptured uterus, and gynecological hysterectomy¹. The female genital and urinary tracts are anatomically closely related; therefore, the potential for injury to one must always be considered when operating on the other. The risk of damage increases when the normal anatomy is altered by primary pathologic factors or when it is insufficiently identified during intraoperative complications, such as severe bleeding or pelvic adhesions².

Ureterovaginal fistula predominantly occurs as a result of ureteral injury during gynaecological/obstetric surgery like abdominal/vaginal/radical hysterectomy, or anterior colporrhaphy and other pelvic surgical procedures like vascular surgery, urological surgery, including retropubic bladder neck

suspensions or colon surgery³. This fistula can also result from locally advanced malignant disease, radiation therapy, pelvic trauma or chronic inflammatory diseases like actinomycosis⁴. Laparoscopically-assisted vaginal hysterectomy⁵ and rarely transvaginal oocyte retrieval⁶ have also been considered in the etiology. In cases of iatrogenic post-operative ureterovaginal fistula, ureteral injury usually occurs in the form of laceration, trans-section, crushing, avulsion, suture ligation (partial/complete) or ischaemia due to the devitalisation of the ureteral blood supply.

Genito-urinary tract injuries due to obstetric and gynecologic surgery are normally divided into two categories: acute complications such as bladder laceration or ureter laceration that can be identified immediately during the operation, and chronic complications such as vesicovaginal fistula, ureterovaginal fistula, and urethrovaginal fistula, which can occur later on. Previous study noted that urinary tract injury complicates an estimated 0.2 to 1% of all gynecologic procedures and pelvic operations⁷. Another study noted 82.0% of ureter injuries occur during pelvic surgery⁸, and 75% of urinary tract injuries are due to gynecologic surgery⁹.

Prolonged labor is another culprit in the formation of fistula. The main problem is hypoxia due to prolonged labor. In addition, the use of vacuum, forceps and episiotomy are considered risk factors. Vesicovaginal fistulas (VVF) developed in 10 patients after vaginal delivery and this was the most frequent (10/15) cause of fistulas¹⁰. The main presentation of fistula is urinary incontinence. The incontinence is usually constant developing 1 to 4 weeks after surgery¹¹. Pelvic adhesions due to previous surgery, repeated caesarean section, markedly enlarged uterus at the time of hysterectomy and massive bleeding obscuring the operative field could be considered as the main causes of iatrogenic genitourinary fistula⁴.

Materials and Methods:

This cross sectional observational study was conducted in the Department of Obstetrics & Gynaecology, Bangabandhu Sheikh Mujib Medical University. Diagnosis and evaluation of patients condition was made on the basis of patient's statement, clinical examination and available medical records.

A thorough clinical examination and relevant investigations were conducted. All the information was recorded in a structured questionnaire. Data was checked and rechecked for omissions, inconsistencies and improbabilities. Data analysis was performed by Statistical Package for Social Science (SPSS), version-22. Data was edited, coded and entered in to the computer. Statistical analyses were done and level of significance was measured by using appropriate hypothetical testing. Level of significance (p value) is set at 0.05 and confidence interval at 95%. Results were presented as

text, tables and diagram.

Result & Observation:

Table I shows the mean age of the study patient was 32.5 ± 9.54 years. Maximum patients (52.0%) belonged to the age group 31-40 years. In this study vesicovaginal fistula was commonest iatrogenic genitourinary fistula, present in 34 patients, followed by ureterovaginal fistula in 10 patients and 6 patients detected urethrovaginal fistula (Figure 1).

Total of 50 patients fulfilling inclusion/exclusion criteria were studied. Results and observations are given below:

Table I: Demographic characteristics of the respondents (n=50)

Age (years)	Frequency	Percentage (%)
21-30	14	28.0
31-40	26	52.0
>40	10	20.0
Mean $\pm$ SD	32.5 ± 9.54	

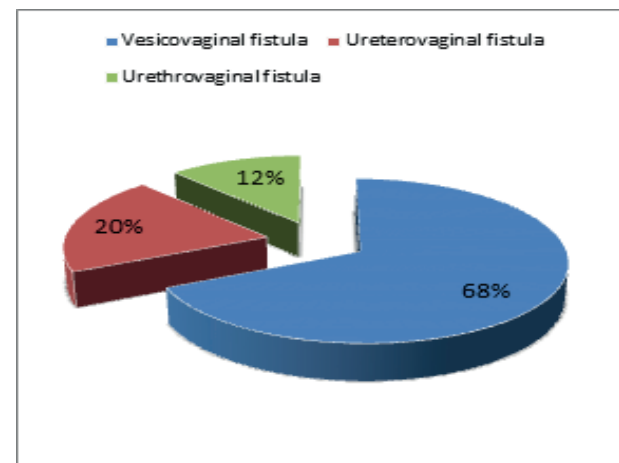


Figure 1: Types of iatrogenic fistula (n = 50)

Table II shows the aetiological factors for iatrogenic fistulas revealed that, 46.0% of women developed iatrogenic fistulas during vaginal hysterectomy, 18.0% during abdominal hysterectomy, 20.0% during laparotomy with salphingoophorectmy and 16.0% due to laparotomy with cystectomy.

Table II: Surgeries causing iatrogenic fistulas (n=50)

Aetiological factors	Frequency	Total
Vaginal hysterectomy	23	46.0
Abdominal hysterectomy	9	18.0
Laparotomy with salphingoophorectmy	10	20.0
Laparotomy with Cystectomy	8	16.0

Table- III: Risk factors profile of study subject (n=50)

Risk factors	Frequency	Percentage (%)
Obesity	38	76.0
Endometriosis	3	6.0
H/O pelvic malignancy	7	14.0
H/O pelvic surgery	43	86.0
History of PID/genital infection	18	36.0
History of abdominal surgery	13	26.0

The risk factors are shown on table. Among the risk factors obesity present in 76.0% cases; H/O pelvic surgery were 86.0% cases and History of PID/genital infection were 36.0 % cases.

Discussion:

In this study most of the patients belonged to the age group 31-40 years (52.0%). Mean age was 32.5 ± 9.54 years. Vesicovaginal fistula was commonest iatrogenic genitourinary fistula, present in 34 patients. Ureterovaginal fistulas were detected in 10 patient's and 6 patients detected urethrovaginal fistula. Aetiological factors for iatrogenic fistulas revealed that, 46.0% of women occurred due to vaginal hysterectomy, 18.0% during abdominal hysterectomy, 20.0% due to laparotomy with salpingoophorectomy and 16.0% during laparotomy with cystectomy.

Findings are consistent with result of other study. Mean age of patients was 34.2 ± 9.4 (23-65) years¹². In another study, age ranged from 22 - 70 years (mean 35.18 ± 13.907)³. A range of obstetric and gynecological procedures led to the development of IF, including CS (57.4 %), CS/hysterectomy (19.8 %), gynecological hysterectomy (19.6 %), ruptured uterus repair (3.1 %), and induced abortion (0.1 %). Other surgeries, such as destructive vaginal operations or symphysiotomy, also carry risks of accidental harm from the provider¹³. Retrospective analysis reported iatrogenic genitourinary fistula developed during gynecological procedures, most commonly hysterectomy. Vesico-[utero]/-cervico-vaginal fistulas were the most common (43.6 %), followed by ureteric injuries (33.9 %) and vault fistulas (22.5 %). One quarter of women with iatrogenic fistulas had previously undergone a laparotomy¹.

On evaluation of risk factors, present study shows that previous pelvic surgery, adhesion, previous PID, etc. were predisposing factors. In this study obesity present in 76.0% cases; H/O pelvic surgery were 86.0% cases and History of PID/genital infection were 36.0 % cases.

Previous study demonstrated that several factors are suspected to place a woman at risk of IF. These include prior uterine operation, endometriosis, cervical myoma, and prior pelvic radiation¹⁴⁻¹⁶. Scar tissue and adhesions from prior laparotomies can create challenges for providers performing obstetric and gynecological surgery. It is therefore reasonable to hypothesize that obstetric or gynecological surgery might carry a greater risk of iatrogenic injury for women who have

undergone a laparotomy in the past¹⁴.

Previous study reported that pelvic adhesions, radiotherapy, large uterus, gynecologic malignancies, endometriosis, anatomic anomalies are risk factors that may lead to genitourinary fistula^{17,18}. The most important factor determining prognosis in ureter injuries is time interval from diagnosis to treatment. Intraoperative diagnosis reduces morbidity and mortality but delayed diagnosis may manifest itself with serious clinical consequences¹⁹. Unfortunately, most of the ureter injuries are diagnosed at a late stage. To reduce rate of urinary tract injuries during gynecological and obstetrical operations, a profound knowledge of anatomy and use of correct surgical techniques are required. Complications secondary to urinary tract injuries may be eliminated by early diagnosis and treatment¹².

Conclusions:

Urinary leakage following gynaecological surgery is a dreaded complication due to the formation of urogenital fistula. It has significant morbidity, with social and psychological aspects aggravating the clinical situation. Bladder injury occurred very frequently as opposed to ureteral injury. The variety of injured states, difficulty of diagnosis, and time to complete cure were much greater among patients with ureteral injury. When a urologic complication develops, early diagnosis and early urologic intervention are necessary to prevent the occurrence of delayed urologic complications. Risk factors in our study include previous pelvic surgery, pelvic disease including malignancies and abdominal surgery. Pre-operative assessment of these risk factors, meticulous surgery, use of sharp dissection in order to mobilize the bladder from the operative field particularly when the plane has been altered by disease or scarring, may prevent the iatrogenic genitourinary fistula.

References:

1. Raassen T, Ngongo C & Mahendeka M. Iatrogenic genitourinary fistula: an 18-year retrospective review of 805 injuries. *Int Urogynecol J*. 2014.
<https://doi.org/10.1007/s00192-014-2445-3>
PMid:25062654 PMCID:PMC4234894
2. Lee J, Choe J, Lee H, Seo J. Urologic Complications Following Obstetric and Gynecologic Surgery. *Korean J Urol*. 2012;53:795-799.
<https://doi.org/10.4111/kju.2012.53.11.795>
PMid:23185673 PMCID:PMC3502740
3. Murtaza B, Mahmood A, Niaz W, Akmal M, Ahmad H, Saeed S. Ureterovaginal fistula - etiological factors and outcome. *J Pak Med Assoc*. 2012; 62: 999-1003.
4. Rovner ES. Urinary tract fistula. In: Wein JA. *Campbell-Walsh Urology*. 9th ed. Philadelphia: Saunders Elsevier. 2007; 2341-5.
5. Waihenya CG. Ureterovaginal fistula following laparoscopic assisted vaginal hysterectomy: case report. *East Afr Med J*. 2006; 83: 346-8.

<https://doi.org/10.4314/camj.v83i6.9444>

PMid:16989382

6. Von Eye Corleta H, Moretto M, D'Avila AM, Berger M. Immediate ureterovaginal fistula secondary to oocyte retrieval: a case report. *Fertil Steril*. 2008; 90: 2006.

<https://doi.org/10.1016/j.fertnstert.2008.03.005>

PMid:18440002

7. Gilmour DT, Dwyer PL, Carey MP. Lower urinary tract injury during gynecologic surgery and its detection by intraoperative cystoscopy. *Obstet Gynecol*. 1999;94(5 Pt 2):883-889.

[https://doi.org/10.1016/S0029-7844\(99\)00456-1](https://doi.org/10.1016/S0029-7844(99)00456-1)

PMid:10546778

8. Aronson MP, Bose TM. Urinary tract injury in pelvic surgery. *Clin Obstet Gynecol*. 2002;45:428-438.

<https://doi.org/10.1097/00003081-200206000-00015>

PMid:12048402

9. Thompson JD. Operative injuries to the ureter: prevention, recognition, and management. In: Rock JA, Thompson JD, editors. *TeLinde's operative gynecology*. 8th ed. Philadelphia: Lippincott Williams & Wilkins; 1997. pp. 1135-1174.

10. Başaranoglu S, Deregözü A, Hatırnaz Ş, Şahin C, Kadanali. Retrospective Analysis of Patients with Genitourinary Fistula. *Gynecol Obstet Reprod Med*. 2017;23:1-5.

<https://doi.org/10.21613/GORM.2016.637>

11. Mandal AK, Sharma SK, Vaidyanathan S, Goswami AK. Ureterovaginal fistula: Summary of 18 years experience. *Br J Urol*. 1990; 65: 453-6.

<https://doi.org/10.1111/j.1464-410X.1990.tb14785.x>

PMid:2354309

12. Basaranoglu S, Deregözü A, Köroğlu N, Kalkan M, Şahin C, Kadanali S. Early and Late Diagnosis of Iatrogenic Urinary Tract Injuries During Obstetric and Gynecological Operations. *Journal of Clinical and Experimental*

Investigations. 2016; 7(3): 245-249.

<https://doi.org/10.5799/jcei.328617>

13. Onsrud M, Sjoveian S, Mukwege D. Cesarean delivery-related fistulae in the Democratic Republic of Congo. *Int J Gynaecol Obstet*. 2011; 114:10-14.

<https://doi.org/10.1016/j.ijgo.2011.01.018>

PMid:21529808

14. Mathevet P, Valencia P, Cousin C, Mellier G, Dargent D. Operative injuries during vaginal hysterectomy. *Eur J Obstet Gynecol Reprod Biol*. 2001;97:71-75.

[https://doi.org/10.1016/S0301-2115\(00\)00484-X](https://doi.org/10.1016/S0301-2115(00)00484-X)

PMid:11435013

15. Mteta KA, Mbwapo J, Mvungi M. Iatrogenic ureteric and bladder injuries in obstetric and gynaecologic surgeries. *East Afr Med J*. 2006;83:79-83.

<https://doi.org/10.4314/camj.v83i2.9392>

PMid:16708878

16. Tancer ML. Observation on prevention and management of vesicovaginal fistula after total hysterectomy. *Surg Gynecol Obstet*. 1992;175:501-506.

17. Selzmann AA, Spirnale JP. Iatrogenic ureteral injuries: a 20 year experience in treating injuries. *J Urol*. 1996;155:87881.

[https://doi.org/10.1016/S0022-5347\(01\)66332-8](https://doi.org/10.1016/S0022-5347(01)66332-8)

PMid:8583597

18. Tijani KH, Onwuzurigbo KI, Ojewola RW, Afolabi BB, Akanmu NO. Iatrogenic ureteric injuries in a Nigerian teaching hospital: experience in the last decade. *East Afr Med J*. 2011; 8:304-9.

19. Hammad FT, Alqaiwani KM, Shirodkar SS. The role of urologists in the management of urological injuries during obstetric and gynaecologic surgery. *Int Urogynecol J Pelvic Floor Dysfunct*. 2010;21:1237-41.

<https://doi.org/10.1007/s00192-010-1173-6>

PMid:20458464

Association of Risk Factors of Acute Myocardial Infarction and Heart Blockage among Non-Diabetic Patients in A Tertiary Care Hospital– An Observational Study

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Abstract

Introduction: Cardiovascular diseases (CVDs) are a leading cause of death in the world. In 2015, an estimated 442.7 million prevalent cases of CVD were present worldwide. Cardiovascular diseases account for more than 17 million deaths globally each year. Previous studies identified diabetes mellitus, hypertension, hypercholesterolemia, smoking, alcohol consumption, obesity and sedentary lifestyle as risk factors. **Aim of the study:** The aim of this study was to determine the risk factors for acute myocardial infarction associated with heart blockage among non-diabetic patients. **Materials and Methods:** This was an observational study conducted in the Department of Cardiology of Jashore Medical College Sadar Hospital, Jashore, Bangladesh during the period from April, 2021 to March, 2022. In this study, we included 120 non-diabetic patients who were diagnosed with myocardial infarction. **Result:** Mean age was 53.03 ± 11.3 years & most of our patients were male. Among all patients, majority (65%) patients had > 60% blockage, followed by 30(25%) patients had 40%-60% artery blockage, and <40% blockage was found in 10% patients. Hypertension, dyslipidemia & dyslipidemia with hypertension, age ≥ 60 years, family history of CHD, smoking, diabetes & obesity were individual risk factors of CHD among non-diabetic patients. The most common risk factors for heart blockage were age >45 years, high blood pressure, high LDL, unhealthy diet, and stressful life. **Conclusion:** In our study, we found hypertension, history of CHD, dyslipidemia, dyslipidemia with hypertension, stress, age ≥ 60 years, and obesity were individual risk factors for CHD. These elements work as crucial risk factors for myocardial infarction in non-diabetic patients. Risk factors like age >45 years, high blood pressure, high LDL, unhealthy diet, and stressful life were responsible for the highest heart blockage in myocardial infarction patients.

Keywords: Myocardial infarction, Non-diabetic, Risk factor.

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Introduction:

Cardiovascular diseases (CVDs) are a leading cause of death in the world. In 2015, an estimated 442.7 million prevalent cases of CVD were present worldwide¹. Cardiovascular diseases account for more than 17 million deaths globally each year. This figure is expected to grow to 23.6 million by the year 2030. Ischemic heart disease alone caused 7 million deaths worldwide in 2010, an increase of 35% since 1990². CVD accounted for 27% of all deaths in South Asia in 2013. This has been a substantial rise since 1990 when CVD accounted for only 15% of deaths³. The prevalence of coronary artery disease (CAD) in Bangladesh

is about 4-6% and CVD is responsible for 17% of total deaths⁴. Coronary artery disease may manifest clinically as either chronic stable angina or acute coronary syndrome⁵. ACS encompasses unstable angina (UA), ST-segment elevation MI (STEMI), or acute non-ST-segment elevation MI (NSTEMI). ACS without myocardial necrosis is defined as UA, whereas myocardial necrosis is a necessary component of either STEMI or NSTEMI⁶. STEMI is a clinical syndrome defined by characteristic symptoms of myocardial ischemia in association with ST elevation in the ECG and release of biomarkers of myocardial necrosis⁷. At present, STEMI comprises approximately 25% to 40% of all MI presentations. Although subjects with STEMI or NSTEMI share the same cardiovascular risk factors, patients with STEMI have worse short-term mortality compared with patients with NSTEMI⁸. As there is considerable variability in short-term mortality risk, therefore, in patients with STEMI, early risk stratification is crucial for successful initial management⁹. The pathogenesis of coronary artery disease remains incompletely understood. Interplay between environmental and genetic factors likely to the pathophysiology of coronary artery disease. The classic risk factors such as hypertension, dyslipidemia, diabetes mellitus and smoking undoubtedly play a vital

role; in addition some emerging risk factors and as-yet-unrecognized factors may be important¹⁰. However, they do not entirely explain the variation in cardiovascular disease incidence and mortality between individuals and among population¹¹. Therefore, additional risk factors have been proposed to better identify patients potentially at risk for CAD¹². Many individual new biomarkers have been related to cardiovascular risk, including levels of CRP (C-reactive protein), B-type natriuretic peptide (BNP), fibrinogen, D-dimer and homocysteine. Among these new biomarker is microalbuminuria (MAU), which is gaining recognition as a marker of an atherogenesis, owing to its association with several atherosclerotic risk factors and early systemic vascular (endothelial) damage¹³. Microalbuminuria (MAU) as a biomarker now a day is also considered a risk marker for CHD in diabetics and non-diabetics¹⁴. The prevalence of coronary artery disease (CAD), a major contributor to CVD, is related to the increasing prevalence of modifiable risk factors¹⁵. Previous studies identified diabetes mellitus, hypertension, hypercholesterolemia, smoking, alcohol consumption, obesity and sedentary lifestyle as risk factors^{16,17}. Other risk factors identified were waist-to-hip ratio, dietary patterns, physical inactivity, blood apolipoproteins, psychosocial factors, loneliness and social isolation and C-reactive protein, uric acid and homocysteine levels¹⁸⁻²². Therefore, in this study we aimed to determine the risk factors for acute myocardial infarction associated with heart blockage among non-diabetic patients.

Materials and Methods:

This was an observational study and conducted in the Department of Cardiology of Jashore Medical College Sadar Hospital, Jashore, Bangladesh during the period from April, 2021 to March, 2022. In this study, we included 120 non-diabetic patients who were diagnosed with myocardial infarction. These are the following criteria to be eligible for the enrollment as our study participants: a) Patients aged above 20 years old; b) Patients with ST-elevation myocardial infarction; c) Patients with non ST-elevation myocardial infarction; d) Patients with acute myocardial infarction; e) Patients who were willing to participate were included in the study. And a) Patients with Diabetes mellitus; b) Patients with Coagulopathy; c) Patients with previous H/O of myocardial infarction; d) Patients with cardiomyopathy; e) Patients with any history acute illness (e.g., renal or pancreatic diseases etc.) were excluded from our study.

After admission of a patient with chest pain suggestive of acute coronary syndrome, a detailed history and physical examination was performed. Patients were asked about the major modifiable risk factors profile of coronary artery disease such as hypertension, diabetes mellitus, smoking status, dyslipidemia and family history of CVD. Previous medical records were also checked for these risk factors. A 12 lead resting ECG was done at a paper speed of 25 mm/s and 10 mm standardization at admission by placing the leads in proper position. Under aseptic precaution blood sample for highly sensitive troponin I was drawn on first

assessment (designated as 0 hour). sample was then sent to same standard laboratory for estimation of highly sensitive cardiac troponin-I level. Another sample was sent 3 to 6 hours after first sample. The diagnosis of acute STEMI was made with electrocardiographic (ECG) changes i.e. ST-segment elevation at the J point in 2 contiguous leads with the cut-point: 21 mm in all leads other than V2-V3 where the following cut-points apply. ≥ 2 mm in men ≥ 40 years, ≥ 2.5 mm in men < 40 years, or ≥ 1.5 mm in women regardless of age. Plus clinical evidence of acute myocardial ischemia and detection of a rise and /or fall of Tn I values with at least 1 value above the 99th percentile of upper reference limit.

Statistical Analysis:

All data were recorded systematically in preformed data collection form and quantitative data was expressed as mean and standard deviation and qualitative data was expressed as frequency distribution and percentage. Statistical analysis was performed by using SPSS (Statistical Package for Social Sciences) for windows version 10. Probability value < 0.05 was considered as level of significance. The study was approved by Ethical Review Committee of Jashore Medical College Sadar Hospital, Jashore, Bangladesh.

Results:

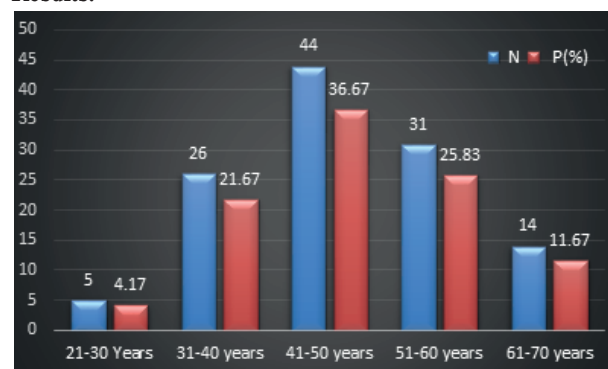


Figure 1: Age distribution of our study patients

Figure 1 shows that majority (36.67%) of participants belonged to the age group 41-50 years, followed by 25.83% of participants were 51-60 years and 21.67% belonged to the age group 31-40 years. Only 11.67% & 4.17% patients were found in 61-70 years & 21-30 years age group respectively.

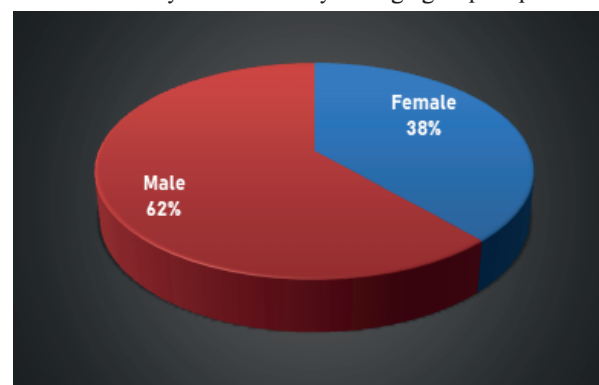


Figure 2: Gender distribution of our study patients

Figure 2 shows that most of the participants were male (62%) compared to female (38%).

Table I shows the baseline characteristics of our study participants. We found the mean age was 53.03 ± 11.3 years. Among all patients, 36.67% had family history of hypertension, 35.83% & 31.67% had history of CVD & dyslipidemia respectively. Among all patients, BMI was 28.97 ± 4.24 kg/m². Heart rate was 86 ± 17 per mins. Both systolic & diastolic bp were 135.24 ± 20.78 & 83.94 ± 10.69 respectively. Cholesterol was found 199.83 ± 42.16 mg/dL, and HDL & LDL were found 40.21 ± 9.05 & 122.35 ± 35.59 mg/dL respectively. Among all patients, majority (65%) patients had > 60% blockage, followed by 30(25%) patients had 40-60% artery blockage, and <40% blockage was found in 10% patients.

Table I: Baseline characteristics of our study subjects

Baseline characteristics	N	P(%)
Mean age (years)	53.03±11.3	
History of hypertension	44	36.67
Family History of CHD	43	35.83
History of dyslipidemia	38	31.67
BMI (kg/m ²)	28.97±4.24	
Heart Rate (per minute)	86 ± 17	
Systolic blood pressure (mm Hg)	135.24 ± 20.78	
Diastolic blood pressure (mm Hg)	83.94 ± 10.69	
Mean FBG (mg/dL)	119.45 ± 63.10	
Triglycerides (mg/dL)	187.85±55.04	
Total cholesterol (mg/dL)	199.83 ± 42.16	
HDL (mg/dL)	40.21 ± 9.05	
LDL (mg/dL)	122.35 ± 35.59	
CAG findings		
<40%	12	10.00
40% - 60%	30	25.00
>60%	78	65.00

CVD= cardiovascular disease, BMI = body mass index, FBS = fasting blood glucose, HDL=high-density lipoprotein, LDL=low-density lipoprotein

Table II shows the risk factors for myocardial infarction. Among 120 cases, majority (68.33%) patients had hypertension. We found dyslipidemia was 55.83%. Dyslipidemia with hypertension was found in 48.33% cases. Stress, age ≥ 60 years, family history of CHD, history of CHD, smoking, diabetes & obesity were also individual risk factors of CHD among non-diabetic patients.

Table II: Risk factors for myocardial infarction among non-diabetic patients

Risk Factors	N	P(%)	P-value
Dyslipidemia	67	55.83	0.02
Hypertension	82	68.33	0.04
Dyslipidemia with hypertension	58	48.33	0.03
Stress	26	23.33	0.01
Age ≥ 60 years	12	10.00	0.01
Family history of CHD	35	29.17	0.02
History of CHD	43	35.83	0.03
Smoking	49	40.83	0.01
Obesity	38	31.67	0.01

Table III shows the association of risk factors for heart blockage in myocardial infarction patients. The most common risk factors were age >45 years, high blood pressure, high LDL, unhealthy diet, and stressful life. There were some other individual risk factors that were found in our patients like smoking, being overweight, rheumatoid arthritis, and physical inactivity.

Table III: Association of risk factors for heart blockage in myocardial infarction patients

Risk Factors	N	P(%)	P-value
Age > 45 years	75	62.50	0.01
High blood pressure	82	68.33	0.01
High low-density lipoprotein (LDL) cholesterol	72	60.00	0.01
Overweight or obesity	28	23.33	0.01
Unhealthy diet	94	78.33	0.02
Smoking	43	35.83	0.01
Rheumatoid arthritis	27	22.50	0.04
Stressful life	89	74.17	0.01
Physical inactivity	45	37.50	0.02

Discussion:

In our study majority (36.67%) of participants belonged to the age group 41-50 years. A study conducted by Bahall et al found the majority of patients were in 60-69 years age group²³. In this study we found female were 38% and male were 62%. Bahall et al found male 55% & female 45% in their study similar to our study²³. We found the mean age was 53.03 ± 11.3 years. In the study by Haffner et al., with 7 years of follow-up, the mean age of the study population at baseline was less than 60 years,²⁴ whereas in many other studies the mean age of the study population was 60–65 years at baseline²⁵⁻²⁷. Bahall et al found the overall mean age of all patients was 59.9 ± 12.07 years²³. In our study, hypertension was the most common risk factor for AMI in non-diabetic patients. Dyslipidemia, dyslipidemia with hypertension, stress, age ≥ 60 years, family history of CHD, CAD, smoking, diabetes & obesity were also individual risk factors of CHD among non-diabetic patients. Traditional risk factors such as hypertension,

diabetes mellitus, history of IHD, family history of IHD, smoking and alcohol consumption, but not stress and hypercholesterolemia, were associated with AMI. These risk factors were also identified in the Framingham Heart study and the INTERHEART study^{28,29}. Stress and hypercholesterolemia have been identified as risk factors in other studies^{30,31}. This may have been related to the patients' unclear understanding and lack of uniformity among patients' understanding of hypercholesterolemia confirmation. The lack of an association, though, has also been noted in other studies²³. Quintana et al. found that hyperlipidemia was not associated with myocardial infarction-related fatality³². In a study conducted by Goldfeld et al., patients with cardiac symptoms without overt CAD showed similar depression and/or stress levels as postmyocardial infarction patients³³. Hypercholesterolemia is still a cause of concern since it is related to dietary patterns and type of food consumption³⁴. Clusters of risk factors for CAD have been identified in numerous studies in Trinidad²³. Thomas et al. revealed that diabetes mellitus, hypertension, hyperlipidemia and cigarette smoking were prevalent among patients presenting with AMI³⁵. Mungrue et al. identified smoking and BMI as predictors of AMI-related death or survival³⁶. Smoking was associated with a 1.6-times higher risk for AMI and BMI with a 1.3-times higher risk³⁶. Alfred et al. found the most common risks associated with AMI in Tobago to be dyslipidemia, hypertension and diabetes mellitus³⁷. Smoking, diabetes, hypertension and history of CAD were found to be the most common cardiovascular risk factors in Libya,³⁸ and smoking and a family history of CAD were the common ones in Pakistan³⁹. In a study on the epidemiology of myocardial infarction, associated risk factors for AMI mortality included age of > 84 years, female sex, educational level and smoking⁴⁰. In the Nurses' Health Study the excess risk of CHD mortality associated with prior CHD was higher than that associated with diabetes in all age groups studied (<55 years, 55–64 years and ≥65 years). This was, however, dependent on the duration of diabetes so that in women with a diabetes duration of more than 15 years the risk of CHD death was similar to that in women with prior CHD but no diabetes⁴¹. It is well-documented that diabetes raises the risk of CHD to a greater extent in women than in men^{42,43}. It is as yet unknown what generates this increased risk in diabetic women that already exists in the prediabetic stages as it is only partly explained by an excess of the classic risk factors^{44,45}. However, in the study by Mukamal et al. the results were sensitive to the duration of diabetes; when newly detected cases of diabetes were added to the analysis, CHD conferred a higher risk than diabetes⁴². Bahall et al found that diabetes, hypertension, smoking and alcohol consumption were significantly associated with AMI cases. However, stressful life, hypertension, hypercholesterolemia and smoking showed significant associations among controls²³. This is in contrast to the findings of

Kawano et al. who found that hypercholesterolemia is an independent risk factor for AMI in men but not in women⁴⁶.

Conclusion and recommendations

In our study, we found hypertension, history of CHD, family history of CHD, smoking is associated with CHD. Dyslipidemia, dyslipidemia with hypertension, stress, age ≥ 60 years, and obesity were also individual risk factors for CHD. These elements work as crucial risk factors for myocardial infarction in non-diabetic patients. Risk factors like age >45 years, high blood pressure, high LDL, unhealthy diet, and stressful life were responsible for the highest heart blockage in myocardial infarction patients. Early identification of modifiable risk factors is important to set the strategy for prevention. So further study with a prospective and longitudinal study design including a larger sample size needs to be done to identify more risk factors to prevent mortality among non-diabetic patients.

References:

1. Roth GA, Johnson C, Abajobir A, Abd-Allah F, Abera SF, Abyu G, et al. Global, regional, and national burden of cardiovascular diseases for 10 causes, 1990 to 2015. *Journal of the American college of cardiology*. 2017 Jul 4;70(1):1-25.
2. Wong ND. Epidemiological studies of CHD and the evolution of preventive cardiology. *Nature Reviews Cardiology*. 2014 May;11(5):276-89. <https://doi.org/10.1038/nrcardio.2014.26> PMID:24663092
3. Roth GA, Huffman MD, Moran AE, Feigin V, Mensah GA, Naghavi M, et al. Global and regional patterns in cardiovascular mortality from 1990 to 2013. *Circulation*. 2015 Oct 27;132(17):1667-78. <https://doi.org/10.1161/CIRCULATIONAHA.114.008720> PMID:26503749
4. Islam AM, Mohibullah AK, Paul T. Cardiovascular disease in Bangladesh: a review. *Bangladesh Heart Journal*. 2016;31(2):80-99. <https://doi.org/10.3329/bhj.v31i2.32379>
5. Giugliano RP, Braunwald E. Non-ST elevation acute coronary syndromes, In: Zipes DP, Libby P, Bonow RO, Mann DL, Tomaselli GF. *Braunwald's Heart Disease: A textbook of cardiovascular medicine*. 11th ed. Philadelphia, Elsevier. 2019;1:1181-208.
6. Baber U, Holmes D, Halperin J, Fuster V. Definitions of acute coronary syndromes. *Hurst's The Heart*. 2017; 1:946-95.
7. O'gara PT, Kushner FG, Ascheim DD, Casey DE, Chung MK, De Lemos JA, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Journal of the American college of cardiology*. 2013 Jan 29;61(4): e78-140.

8. Ishihara M, Fujino M, Ogawa H, Yasuda S, Noguchi T, Nakao K, et al. Clinical Presentation, Management and Outcome of Japanese Patients with Acute Myocardial Infarction in the Troponin Era-Japanese Registry of Acute Myocardial Infarction Diagnosed by Universal Definition (J-MINUET)-. *Circulation Journal*. 2015 May 25;79(6):1255-62.
<https://doi.org/10.1253/circj.CJ-15-0217>
PMid:25912696
9. Chung SR, Yang TH, Shin HC, Jin HY, Seo JS, Jang JS, et al. Initial total bilirubin and clinical outcome in patients with ST-segment elevation myocardial infarction undergoing primary percutaneous coronary intervention with drug-eluting stents. *Circulation Journal*. 2016 May 25;80(6):1437-44.
<https://doi.org/10.1253/circj.CJ-15-1397>
PMid:27151334
10. Islam AM, Majumder AA. Coronary artery disease in Bangladesh: A review. *Indian heart journal*. 2013 Jul 1;65(4):424-35.
<https://doi.org/10.1016/j.ihj.2013.06.004>
PMid:23993003 PMCID:PMC3861019
11. Kuulasmaa K, Tunstall-Pedoe H, Dobson A, Fortmann S, Sans S, Tolonen H, et al. Estimation of contribution of changes in classic risk factors to trends in coronary-event rates across the WHO MONICA Project populations. *The lancet*. 2000 Feb 26;355(9205):675-87.
[https://doi.org/10.1016/S0140-6736\(99\)11180-2](https://doi.org/10.1016/S0140-6736(99)11180-2)
PMid:10703799
12. Hoseini VN, Rasouli M. Microalbuminuria correlates with the prevalence and severity of coronary artery disease in non-diabetic patients. *Cardiology Journal*. 2009;16(2):142-5.
13. Sadaka M, Elhadedy A, Abdelhalim S, Elashmawy H. Albumin to creatinine ratio as a predictor to the severity of coronary artery disease. *Alexandria Journal of Medicine*. 2013 Dec 1;49(4):323-8.
<https://doi.org/10.1016/j.ajme.2013.01.005>
14. Memon AG, Kolachi M. Relationship of Microalbuminuria in Non-Diabetic and Non-Hypertensive Patients with Acute Myocardial Infarction. *J Clin Exp Cardiol*. 2015;6(9):403-9.
<https://doi.org/10.4172/2155-9880.1000403>
15. Kreatsoulas C, Anand SS. The impact of social determinants on cardiovascular disease. *Can J Cardiol*. 2010;26(Suppl C):8C-13C.
[https://doi.org/10.1016/S0828-282X\(10\)71075-8](https://doi.org/10.1016/S0828-282X(10)71075-8)
PMid:20847985
16. Mahmood SS, Levy D, Vasan RS, Wang TJ. The Framingham heart study and the epidemiology of cardiovascular diseases: a historical perspective. *Lancet*. 2014;383(9921):999-1008.
[https://doi.org/10.1016/S0140-6736\(13\)61752-3](https://doi.org/10.1016/S0140-6736(13)61752-3)
PMid:24084292
17. Ryoo JH, Cho SH, Kim SW. Prediction of risk factors for coronary heart disease using Framingham risk score in Korean men. *PLoS One*. 2012;7(9): e45030.
<https://doi.org/10.1371/journal.pone.0045030>
PMid:23028747 PMCID:PMC3446951
18. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): a case-control study. *Lancet*. 2004; 364(9438):937-52.
[https://doi.org/10.1016/S0140-6736\(04\)17018-9](https://doi.org/10.1016/S0140-6736(04)17018-9)
PMid:15364185
19. Valtorta NK, Kanaan M, Gilbody S, Ronzi S, Hanratty B. Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies. *Heart*. 2016; 102(13):1009-16.
<https://doi.org/10.1136/heartjnl-2015-308790>
PMid:27091846 PMCID:PMC4941172
20. Auer J, Berent R, Lassnig E, Eber B. C-reactive protein and coronary artery disease. *Jpn Heart J*. 2002;43(6):607-19.
<https://doi.org/10.1536/jhj.43.607>
PMid:12558125
21. Sinan Deveci O, Kabakci G, Okutucu S, Tulumen E, Aksoy H, Baris Kaya E, et al. The association between serum uric acid level and coronary artery disease. *Int J Clin Pract*. 2010;64(7):900-7.
<https://doi.org/10.1111/j.1742-1241.2009.02263.x>
PMid:20584223
22. Kazemi MB, Eshraghian K, Omrani GR, Lankarani KB, Hosseini E. Homocysteine level and coronary artery disease. *Angiology*. 2006;57(1):9-14
<https://doi.org/10.1177/000331970605700102>
PMid:16444451
23. Bahall M, Seemungal T, Legall G. Risk factors for first-time acute myocardial infarction patients in Trinidad. *BMC Public Health*. 2018 Jan 19;18(1):161.
<https://doi.org/10.1186/s12889-018-5080-y>
PMid:29351744 PMCID:PMC5775614
24. Haffner SM, Lehto S, Rönnemaa T, et al. Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. *N Engl J Med*. 1998; 339:229-234.
<https://doi.org/10.1056/NEJM199807233390404>
PMid:9673301
25. Lotufo PA, Gaziano JM, Chae CU, et al. Diabetes and all-cause and coronary heart disease mortality among US male physicians. *Arch Intern Med*. 2001; 161:242-247.
<https://doi.org/10.1001/archinte.161.2.242>
PMid:11176738
26. Mukamal KJ, Nesto RW, Cohen MC, et al. Impact of diabetes on long-term survival after acute myocardial infarction: comparability of risk with prior myocardial infarction. *Diabetes Care*. 2001; 24:1422-1427.
<https://doi.org/10.2337/diacare.24.8.1422>
PMid:11473080
27. Cho E, Rimm EB, Stampfer MJ, et al. The impact of

diabetes mellitus and prior myocardial infarction on mortality from all causes and from coronary heart disease in men. *J Am Coll Cardiol.* 2002; 40:954-960.

[https://doi.org/10.1016/S0735-1097\(02\)02044-2](https://doi.org/10.1016/S0735-1097(02)02044-2)

PMid:12225722

28. Mahmood SS, Levy D, Vasan RS, Wang TJ. The Framingham heart study and the epidemiology of cardiovascular diseases: a historical perspective. *Lancet.* 2014;383(9921):999-1008.

[https://doi.org/10.1016/S0140-6736\(13\)61752-3](https://doi.org/10.1016/S0140-6736(13)61752-3)

PMid:24084292

29. Anand SS, Islam S, Rosengren A, Franzosi G, Steyn K, Yusufali AH, et al. Risk factors for myocardial infarction in women and men: insights from the INTERHEART study. *Eur Heart J.* 2008;29:932-40.

<https://doi.org/10.1093/eurheartj/ehn018>

PMid:18334475

30. Vujcic I, Vlajinac H, Dubljanin E, Vasiljevic Z, Matanovic D, Maksimovic J, et al. Psychosocial stress and risk of myocardial infarction: a case-control study in Belgrade (Serbia). *Acta Cardiol Sin.* 2016; 32:281-9. 10.6515/ACS20150424K.

31. The Fukuoka Heart Study Group. Medication for hypercholesterolemia and the risk of nonfatal acute myocardial infarction: a case-control study in Japan. *Circ J.* 2002; 66:463-8.

<https://doi.org/10.1253/circj.66.463>

32. Quintana HK, Janszky I, Gigante B, Druid H, Ahlbom A, Hallqvist J, et al. Diabetes, hypertension, overweight and hyperlipidaemia and 7-day casefatality in first myocardial infarction. *IJC Metab Endocr.* 2016; 12:30-5. 10.

<https://doi.org/10.1016/j.ijeme.2016.05.009>

33. Goldfeld PRM, Soares LS, Manfro WC. Association of depression and stress in acute myocardial infarction: a case-control study. *Rev Fac Med.* 2015; 63(3):439-48.

<https://doi.org/10.15446/revfacmed.v63n3.50860>

34. Na L, Han T, Zhang W, Wu X, Na G, Du S, et al. A snack dietary pattern increases the risk of hypercholesterolemia in northern Chinese adults: a prospective cohort study. *PLoS One.* 2015;10(8): e0134294.

<https://doi.org/10.1371/journal.pone.0134294>

PMid:26244510 PMCID:PMC4526671

35. Thomas CN, Titus G, Williams D, Simeon D, Pitt-Miller P. Two-year mortality and its determinants following acute myocardial infarction in Trinidad and Tobago. *West Indian Med J.* 2000;49(2):112-4.

36. Mungrue K, Mootoosingh C, Ramsingh S. Epidemiology, risk analysis and clinical outcomes of acute myocardial infarction in Trinidad. *Anadolu Kardiyol Derg.* 2011;11(3):267-70.

<https://doi.org/10.5152/akd.2011.064>

PMid:21501994

37. Alfred R, Okeke O, Moronu C, Elliot V, Frankson A, Barton EN. Descriptive epidemiology of cases of acute myocardial infarction in Tobago. *West Indian Med J.*

2009;58(3):257-60.

38. Abduekkarem AR, El-Shareif HJ, Sharif SI. Evaluation of risk factors in acute myocardial infarction patients admitted to the coronary care unit, Tripoli Medical Centre. *Libya East Mediterr Health J.* 2012;18(4):332-6.

<https://doi.org/10.26719/2012.18.4.332>

PMid:22768694

39. Safdar MHK, Fazal I, Ejaz A, Awan ZI. Risk profile in young patients with acute myocardial infarction. *PAFMJ.* 2010;60(2):212-6.

40. Ahmadi A, Soori H, Mehrabi Y, Etemad K, Khaledifar A. Epidemiological pattern of myocardial infarction and modelling risk factors relevant to in-hospital mortality: the first results from the Iranian myocardial infarction registry. *Kardiol Pol.* 2015;73(6):451-7

<https://doi.org/10.5603/KP.a2014.0230>

PMid:25428813

41. Hu FB, Stampfer MJ, Solomon CG, et al. The impact of diabetes mellitus on mortality from all causes and coronary heart disease in women: 20 years of follow-up. *Arch Intern Med.* 2001; 161:1717-1723.

<https://doi.org/10.1001/archinte.161.14.1717>

PMid:11485504

42. Mukamal KJ, Nesto RW, Cohen MC, et al. Impact of diabetes on long-term survival after acute myocardial infarction: comparability of risk with prior myocardial infarction. *Diabetes Care.* 2001; 24:1422-1427.

<https://doi.org/10.2337/diacare.24.8.1422>

PMid:11473080

43. Becker A, Bos G, De Vegt F, et al. Cardiovascular events in type 2 diabetes: comparison with nondiabetic individuals without and with prior cardiovascular disease. 10-year followup of the Hoorn Study. *Eur Heart J.* 2003; 24:1406-1413.

[https://doi.org/10.1016/S0195-668X\(03\)00197-0](https://doi.org/10.1016/S0195-668X(03)00197-0)

PMid:12909069

44. The DECODE Study Group. Gender difference in all-cause and cardiovascular mortality related to hyperglycaemia and newly diagnosed diabetes. *Diabetologia.* 2003; 46:608-617.

<https://doi.org/10.1007/s00125-003-1096-6>

PMid:12750769

45. Hu FB, Stampfer MJ, Haffner SM, Solomon CG, Willett WC, Manson JE. (2002) Elevated risk of cardiovascular disease prior to clinical diagnosis of type 2 diabetes. *Diabetes Care.* 2002; 25:1129- 1134.

<https://doi.org/10.2337/diacare.25.7.1129>

PMid:12087009

46. Kawano H, Soejima H, Kojima S, Kitagawa A, Ogawa H. Japanese Acute Coronary Syndrome Study (JACSS) investigators. Sex differences of risk factors for acute myocardial infarction in Japanese patients. *Circ J.* 2006; 70(5):513-7.

<https://doi.org/10.1253/circj.70.513>

PMid:16636482

Serum Vitamin D Status in Patients with Asthma-COPD Overlap

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Abstract

Introduction: Asthma-COPD overlap shared its risk factors with asthma and COPD, including development in the later decades of life, airway hyper-responsiveness, often tobacco smoke exposure, and progressive loss of lung function. It has been shown that this group of patients might possess vitamin D deficiency. By assessing the level of vitamin D we can identify the deficiency earlier and can give appropriate supplements. **Objective:** This study was done to assess the serum vitamin D status in patients with Asthma-COPD overlap. **Materials and Methods:** This cross-sectional study was carried out in the Department of Physiology of Bangabandhu Sheikh Mujib Medical University, Dhaka, from January 2018 to July 2018. Total 47 men subjects age ranged between 40-70 years were involved in this study. Among them 23 (twenty three) men (40-70 years) were involved as study group (Group II) and 24 (twenty four) men (40-70 years) were taken as control group (Group I). **Results:** The results were expressed as mean with standard error (mean $\pm$ SEM). The data were statistically analyzed by Graphpad prism (Version 7) using independent sample 't' test. The mean ($\pm$ SEM) of serum vitamin D of Group I and Group II were 16.37 $\pm$ 0.78 kg/m² & 18.47 $\pm$ 1.01 ng/ml respectively. **Conclusion:** Vitamin D deficiency is present in both groups. By this study we recommended that routine estimation of this parameter is important for early detection and prevention of complication related to Asthma-COPD overlap for managing a healthy life.

Key words: Vitamin D, Asthma-COPD overlap, Vitamin D deficiency, Vitamin D insufficiency.

Number of Tables: 04; Number of References: 31; Number of Correspondences: 03.

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Introduction:

Chronic obstructive pulmonary disease (COPD) and bronchial asthma are common airway diseases. COPD is characterized by airway inflammation, increased airway resistance, fibrosis, mucus hypersecretion, parenchymal lesions with reduced elastic recoil and loss of alveolar attachments, leading to airflow limitation, which is not fully reversible with bronchodilator¹. Asthma is characterized by chronic airway inflammation with wheeze, shortness of breath, chest tightness, cough, but its airflow obstruction is fully reversible after treatment with bronchodilator². Global Initiative for Asthma (GINA) and Global Initiative for Chronic Obstructive Lung Disease (GOLD) describe Asthma-COPD overlap as persistent airflow limitation with several features associated with

asthma and several features associated with COPD³. In recent years, it has become evident that several phenotypes of COPD exist. Of them Asthma-COPD overlap (ACO) is a newer one^{4,5}. The prevalence rate of this new entity has been estimated 10 to 55% in Spain⁶, 15 to 16.3 % in China⁷ and 1.6 to 4.5% in Venezuela⁸. Though, all of airway diseases (ACO/ COPD/ Asthma) are preventable and treatable, once developed the disease along with its comorbidities cannot be cured. But their progression and exacerbation of morbidity can be reduced. Medicine treatment alone cannot do this. Now-a-days the interest of role of different non-pharmacological supplements on different lung diseases are outgoing. Vitamin D is well known for its classical role in bone mineralization and calcium homeostasis. The majority of this circulating steroid is derived from sun exposure with a limited dietary contribution. Provitamin D (7-dehydrocholesterol) is converted to previtamin D in the skin by exposure to Ultraviolet B (UVB) radiation. This previtamin D is then isomerized to vitamin D3 by body heat. Vitamin D3 is then transported by the blood to the liver, where it is hydroxylated to 25-hydroxyvitamin D [25(OH)D] and then to the kidneys, to form the active form of 1,25-dihydroxyvitamin D [1,25(OH)2D]. This activation is finely regulated by the parathyroid hormone (PTH)⁹. In addition, the serum level of this vitamin D is also affected by solar zenith angle (season and latitude affect UVB radiation), cloudy environment (attenuate UVB radiation), ozone (absorbs UVB radiation), surface reflection (snow reflect upto 95% of UVB radiation), altitude (affects UVB radiation), skin type (melanin decrease conversion of pro to previtamin D), outdoor staying from 10 am to 2 PM (time of highest UVB exposure), use of sunscreen (block UVB radiation), high body mass index (fat sequesters vitamin D), age (elderly has thinner skin) and environmental temperature (at cold population expose less skin area to UVB radiation)^{9,10,11,12,13,14&15}. Deficiency of this vitamin D might cause rickets, osteomalacia, osteoporosis etc.¹⁶. It has been noticed that non classical role of Vitamin D may possess health benefits, such as prevention of autoimmune disease¹⁷ cardiovascular disorders^{13,18}, hypertension¹⁹ and influenza²⁰. Moreover, higher serum vitamin D concentration [assessed by 25(OH)D] has been associated with better lung function as measured by FEV1 in a large cross-sectional study of the US population²¹. Recently, a group of researchers reported that a significant proportion of young COPD patients were with insufficient (20 to 29 ng/ml) serum 25(OH)D. They also found a statistically significant positive relationship between FEV1 and serum 25(OH)D in this group of patients²². Furthermore, it has been suggested that, lower vitamin D status in COPD might be due to diminished production of pre-vitamin D3 associated with skin aging caused by smoking and limited UVB radiation exposure^{13,23}. In addition, statistically significant association between vitamin D deficiency and asthma has been reported²⁴. Moreover, this vitamin's deficiency was also found to increase the risk of severe asthma exacerbation and need for emergency department evaluation or hospitalization²⁵. In a very recent study, Vitamin D supplementation was shown to reduce the rate of asthma exacerbations requiring treatment

with systemic corticosteroids²⁶. However, as far as it has been searched, association of vitamin D status with ACO has only been observed by Odler et al. (2015) along with other airway disorders (COPD and asthma). They reported 60% of ACO, 76% of COPD and 36% of asthmatic patients had vitamin D deficiency (Odler et al. 2015).

Materials and Methods:

This cross-sectional study was conducted from January 2018 to July 2018 in the Department of Physiology and Center for Advanced Biomedical Research, Bangabandhu Sheikh Mujib Medical University (BSMMU). The protocol of this study was approved by the institutional review board of BSMMU. For this study, 23 pulmonologist diagnosed male (age ≥ 40 years) patients of ACO (group II) enrolled by consecutive sampling from Out Patient Department (OPD) of the National Institute of the Diseases of Chest and Hospital (NIDCH). For comparison, 24 age, smoking status and BMI matched apparently healthy male (group I) were selected from community. A written informed consent was taken from all the participants after detailing of study procedure. With all aseptic precautions 5 ml venous blood was drawn from ante-cubital vein by a disposable plastic syringe for estimation of serum 25(OH)D. Vitamin D3 was measured by using automated analyzer: ARCHITECT Plus ci4100.

Results:

The results were expressed as mean with standard error (mean $\pm$ SEM) and percentage. The data were statistically analyzed by Graphpad prism (Version 7) using independent sample 't' test (to compare serum 25(OH)D between two groups) and Chi square test was done to observe association of vitamin D deficiency and insufficiency with ACO. In the interpretation of results, ≤ 0.05 level of probability (p) was accepted as significant.

Table I: Group of the subject

Group	Number of subjects (n)
Group-I (control group)	24 healthy subject
Group-II (study group)	23 Patients with ACO

General characteristics of the subjects are presented in Table II.

Table-II: General characteristics of participants (n=47)

Variables	Group I	Group II	p value
Age	54.08 $\pm$ 1.68 (40-70)	58.39 $\pm$ 1.79 (40-70)	0.09
Duration of smoking	17.35 $\pm$ 1.08 (4-30)	14.52 $\pm$ 1.20 (4-30)	0.09
BMI(Kg/m ²)	22.51 $\pm$ 0.99	22.41 $\pm$ 0.59	0.93

Data were expressed as mean $\pm$ SEM. Figures in parentheses indicate ranges. Pack year = (number of cigarettes smoked per day/20) X number of years smoked. BMI= Body mass index.

In the present study, the mean $\pm$ SEM of serum 25(OH)D were 16.37 $\pm$ 0.78 and 18.46 $\pm$ 1.01 ng/ml in control and study groups patients, respectively (Table III).

Table-III: Serum 25(OH)D level in two groups (n=47)

Parameter	Group I (n=24)	Group II (n=23)	p value
25(OH)D	16.37 $\pm$ 0.78	18.46 $\pm$ 1.01	0.11
ng/ml mean $\pm$ SEM	(9.5-24.2)	(8.9-27.2)	

Statistical analysis was done by Independent sample 't' test. 25(OH)D = Serum 25- Hydroxycholecalciferol

However, the association of vitamin D deficiency and insufficiency was not found with ACO by chi square test (Table IV).

Table-IV: Association of vitamin D deficiency and insufficiency with ACO

Serum vitamin D status			Total
Group	Deficient[25(OH)D<20ng/ml]	Insufficient[25(OH)D:20-29ng/ml]	
Group I	20(83%)	4(17%)	24
Group II	15(65%)	8(35%)	23
Total	35	12	47

Discussion:

The present study was carried out to observe serum vitamin D status in patients with Asthma-COPD overlap. For this, 23 male stable patients with ACO were studied and their serum 25 (OH)D level were assessed. For comparison, 24 age, smoking status and anthropometric status matched apparently healthy male subjects were also assessed for the above-mentioned variable. In this study, all subjects (both healthy control & ACO patients) had serum 25(OH)D deficiency (<30 ng/ml) (vitamin D council 2017). Similar deficiency was also indicated in apparently healthy population of Bangladesh^{27,28} and other countries²⁹ as well as in ACO patients (Odler et al. 2015). The exact reason of this finding cannot be explained directly from this study. However, indoor staying from 10 AM to 2PM (time of highest UVB radiation)³⁰ and darker skin type (type V with high melanin content)^{30,31} of our study subjects might be obstacle for conversion of 7-dehydrocholesterol to pre vitamin D3 in the skin and could be responsible for this vitamin deficiency. In addition, as both of our healthy as well as ACO patients were smoker and the smoking habit individually has a deleterious influence on serum 25(OH)D²⁹, so this life style could be a causative factor for our findings. In addition, no significant difference was found in the mean serum 25(OH)D level between our control and ACO patients. Similar finding (statistically non-significant) was reported by Odler et al. (2015) in Hungarian ACO population¹.

Conclusion:

From the results of the present study, it may be concluded that, both Bangladeshi healthy population as well as ACO patients might have D3 deficiency. As sunlight is the major natural source of vitamin D we may advice to increase outdoor staying in order to increase duration of sun exposure. We may recommend adequate dietary intake of vitamin D rich food such as milk, cheese, egg yolk, fish etc. Different forms of Vitamin D3 supplementation are also available.

Conflict of Interest: None.

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References:

1. Odler B, Ivancso I, Somogyi V, Benke K, Tamasi L, Gabriella G, et al. Vitamin D deficiency is associated with

impaired disease control in asthma COPD overlap syndrome patients. *Int J Chron Obstruct Pulmon Dis.* 2015;10:2017-2025.

<https://doi.org/10.2147/COPD.S91654>

PMid:26451099 PMCID:PMC4590340

2. Berge M, Aalbers R. The asthma - COPD overlap syndrome: how is it defined and what are its clinical implications? *J Asthma Allergy.* 2016;9:27-35.

<https://doi.org/10.2147/JAA.S78900>

PMid:26929652 PMCID:PMC4755465

3. Global Initiative for Asthma (GINA) and Global Initiative for Chronic Obstructive Lung Disease (GOLD). Diagnosis and initial treatment of asthma, COPD and asthma COPD overlap 2017; [Internet] [Cited 2018 April 2019]. 2019. Available from: <http://ginasthma.org/>

4. Menezes A, Oca M, Padilla R, Nadeau G, Wehrmeister F, Varela M, et al. Increased Risk of Exacerbation and Hospitalization in Subjects with an Overlap Phenotype COPD-Asthma. *Chest.* 2014;145(2): 1-8.

<https://doi.org/10.1378/chest.13-0622>

PMid:24114498

5. Miravittles M, Alcazar B, Alvarez FJ, Bazus T, Calle M, Casanova C, et al. What pulmonologists think about the asthma-COPD overlap syndrome. *Int J Chron Obstruct Pulmon Dis.* 2015;10:1321-30.

<https://doi.org/10.2147/COPD.S88667>

PMid:26270415 PMCID:PMC4507793

6. Muller V, Galffy G, Orosz M, Kovats Z, Odler B, Selroos O, et al. Characteristics of reversible and nonreversible COPD and asthma and COPD overlap syndrome patients: an analysis of salbutamol Easyhaler data. *Int J Chron Obstruct Pulmon Dis.* 2016;11: 93-101.

<https://doi.org/10.2147/COPD.S92331>

PMid:26834466 PMCID:PMC4716721

7. Bai JW, Mao B, Yang WL, Liang S, Lu HW, Xu JF. Asthma-COPD overlap syndrome showed more exacerbations however lower mortality than COPD. *QJM.* 2017;110(7): 431-436.

<https://doi.org/10.1093/qjmed/hcx005>

PMid:28100824

8. Oca MM, Varela MVL, Contreras MEL, Casas A, Schiavi E, Mora JC. Asthma-COPD overlap syndrome (ACOS) in primary care of four Latin America countries: the PUMA study. *BMC Pulm Med.* 2017; 17: 69.

<https://doi.org/10.1186/s12890-017-0414-6>

PMid:28431499 PMCID:PMC5401386

9. Engelsen O. The Relationship between Ultraviolet Radiation Exposure and Vitamin D Status. *Nutrients.* 2010; 2: 482-495.

<https://doi.org/10.3390/nu2050482>

PMid:22254036 PMCID:PMC3257661

10. Blumthaler M, Ambach W. Solar UVB-Albedo of various surfaces. *Photochem Photobiol.* 1988;48: 85-88.

<https://doi.org/10.1111/j.1751-1097.1988.tb02790.x>

PMid:3217444

11. Reilly JJ, Silverman EK, Shapiro SD. Chronic obstructive pulmonary disease. In: Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL (Eds.). *Harrison's*

principles of internal medicine (16th edition). McGraw-Hill Professional: 2004. 1547-1560.

12. Parisi AV, Wilson CA. Pre-vitamin D effective ultraviolet transmission through clothing during simulated wear. *Photodermatol. Photoimmunol Photomed.* 2005;21:303-310.

<https://doi.org/10.1111/j.1600-0781.2005.00180.x>
PMid:16313241

13. Holick MF. Vitamin D deficiency. *N Engl J Med.* 2007 Jul 19;357(3):266-81.

<https://doi.org/10.1056/NEJMra070553>
PMid:17634462

14. Sabburg J, Calbo J. Five years of cloud enhanced surface UV radiation measurements at two sites (in the Northern and Southern Hemispheres). *Atm Res.* 2009;93:902-912.

<https://doi.org/10.1016/j.atmosres.2009.05.003>

15. Harinarayan CV, Holick MF, Prasad UV, Vani PS, Himabindu G. Vitamin D status and sun exposure in India. *Dermatoendocrinol.* 2013; 5(1): 130-141.

<https://doi.org/10.4161/derm.23873>
PMid:24494046 PMCID:PMC3897581

16. Mahmood S, Rahman M, Biswas SK, Saqueeb SN, Zaman S, Manirujjaman M, et al. Vitamin D and Parathyroid Hormone Status in Female Garment Workers: A Case-Control Study in Bangladesh. *Biomed Res Int.* 2017;4105375.

<https://doi.org/10.1155/2017/4105375>

PMid:28473985 PMCID:PMC5394353

17. Ponsonby AL, Lucas RM, Van Der Mei IA. UVR, Vitamin D and three autoimmune diseases--multiple sclerosis, type 1 diabetes, rheumatoid arthritis. *Photochem Photobiol.* 2005 Nov-Dec;81(6):1267-75.

<https://doi.org/10.1562/2005-02-15-IR-441>
PMid:15971932

18. Holick MF, Chen TC. Vitamin D deficiency: a worldwide problem with health consequences. *Am J Clin Nutr.* 2008 Apr;87(4):1080S-6S.

<https://doi.org/10.1093/ajcn/87.4.1080S>
PMid:18400738

19. Pilz S, Tomaschitz A, Ritz E, Pieber TR. Vitamin D status and arterial hypertension: a systematic review. *Nat Rev Cardiol.* 2009 Oct;6(10):621-30.

<https://doi.org/10.1038/nrcardio.2009.135>
PMid:19687790

20. Yamshchikov AV, Desai NS, Blumberg HM, Ziegler TR, Tangpricha V. Vitamin D for treatment and prevention of infectious diseases: a systematic review of randomized controlled trials. *Endocr Pract.* 2009 Jul-Aug;15(5):438-49.

<https://doi.org/10.4158/EP09101.0RR>
PMid:19491064 PMCID:PMC2855046

21. Black PN, Scragg R. Relationship between serum 25-hydroxyvitamin d and pulmonary function in the third national health and nutrition examination survey. *Chest.* 2005 Dec;128(6):3792-8.

<https://doi.org/10.1378/chest.128.6.3792>

PMid:16354847

22. Heidari B, Javadian Y, Monadi M, Dankob Y, Firouzjahi A. Vitamin D status and distribution in patients with chronic obstructive pulmonary disease versus healthy controls. *Caspian J Intern Med.* 2015 Spring;6(2):93-7.

23. Janssens W, Bouillon R, Claes B, Carremans C, Lehouck A, Buysschaert I, et al. Vitamin D deficiency is highly prevalent in COPD and correlates with variants in the vitamin D-binding gene. *Thorax.* 2010; 65: 215-220.

<https://doi.org/10.1136/thx.2009.120659>
PMid:19996341

24. Ginde AA, Mansbach JM, Camargo CA Jr. Vitamin D, respiratory infections, and asthma. *Curr Allergy Asthma Rep.* 2009;. 9(1):81-7.

<https://doi.org/10.1007/s11882-009-0012-7>

PMid:19063829

25. Brehm JM. Vitamin D and Asthma - Life After VIDA? *Curr Allergy Asthma Rep.* 2014; 14(9): 461.

<https://doi.org/10.1007/s11882-014-0461-5>
PMid:25086579 PMCID:PMC4148823

26. Jolliffe DA, Greenberg L, Hooper RL, Griffiths CJ, Camargo CA Jr, Kerley CP, et al. Vitamin D supplementation to prevent asthma exacerbations: a systematic review and meta-analysis of individual participant data. *Lancet Respir Med.* 2007; 5(11): 881-890.

[https://doi.org/10.1016/S2213-2600\(17\)30306-5](https://doi.org/10.1016/S2213-2600(17)30306-5)
PMid:28986128

27. Zaman S, Hawlader M D H, Biswas A, Hasan M, Jahan M, Ahsan G U. High Prevalence of Vitamin D Deficiency among Bangladeshi Children: An Emerging Public Health Problem. *Health.* 2017;9(12): 1680-1688.

<https://doi.org/10.4236/health.2017.912123>

28. Hossain H A, Islam Q A, Khandaker M A K, Ahasan H N. Study of Serum Vitamin D Level in Different Socio-Demographic Population- A Pilot Study. *J Medicine.* 2018;19: 22-29.

<https://doi.org/10.3329/jom.v19i1.34836>

29. Kassi EN, Stavropoulos S, Kokkoris P, Galanos A, Moutsatsou P, Dimas C, et al. Smoking is a significant determinant of low serum vitamin D in young and middle-aged healthy males. *Hormones (Athens).* 2015 Apr-Jun;14(2):245-50.

<https://doi.org/10.14310/horm.2002.1521>
PMid:25402376

30. Engelsen O. The relationship between ultraviolet radiation exposure and vitamin D status. *Nutrients.* 2010 May;2(5): 482-95.

<https://doi.org/10.3390/nu2050482>

PMid:22254036 PMCID:PMC3257661

31. Webb AR, Engelsen O. Calculated ultraviolet exposure levels for a healthy vitamin D status. *Photochem Photobiol.* 2006 Nov-Dec;82(6):1 697-703.

<https://doi.org/10.1562/2006-09-01-RA-670>
PMid:16958558

Evaluation of Sociodemographic Characteristics and Effects of Sensory Stimulation for Management of Acute Stroke Syndrome in Children

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Abstract:

Introduction with Objective: In this study our main goal is to assess the sociodemographic characteristics of acute stroke syndrome in children and effect of sensory stimulation for management of acute stroke. **Materials and Methods:** This randomized control trial study conducted at Magura Medical College Hospital, Magura from January 2021 to December 2023. During experiment, in study group was 43 patients & 42 patients in control group. Children in study group were given sensory stimulation therapy while those in control group received no sensory stimulation. **Result:** during the study, highest number of the patients in study and control group belong to 2 months to 1 year's age group, (n=24) and (n=27). 57% patients from urban and 43% from rural. 76% patients had ischemic stroke and 24% had hemorrhagic stroke. Also, GCS score improved significantly after two weeks of sensory stimulation in study group. **Conclusion:** From our study we can conclude that, early sensory stimulation has been shown to have significant effects, both beneficial and detrimental, on stroke size and functional outcome. Further study is needed for better outcome.

Keyword: Acute ischemic stroke, sensory stimulation, GCS score.

Number of Tables: 03; Number of Figure: 03; Number of Reference: 07; Number of Correspondences: 03.

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Introduction:

Acute ischemic stroke (AIS) is a common disorder with almost 700 000 new or recurrent events per year in the United States. The risk of AIS varies by region, with the highest incidence occurring in the so-called stroke belt in the southern part of the country^{1,2}. The risk of AIS varies among African Americans, Latinos, and Caucasians, with the highest risk in African Americans. The risk of AIS increases with age, and the ageing of the US population portends an increase in AIS incidence and prevalence over the next several decades, despite increasingly effective efforts to treat stroke risk factors and the use of other preventive strategies. The incidence of AIS is also increasing in many other countries, largely related to potentially modifiable risk factors, especially in the developing world. The incidence of AIS is also greater among women beginning with an increased risk in the perimenopausal period and continuing into older age groups³. The role of sensory stimulation during the acute phase of ischemic stroke is fundamentally different from its putative role for long-term recovery. The latter evokes a complex process of neuroplasticity and finally aims to improve functional recovery but not primarily to protect brain tissue from ischemia. In contrast, sensory stimulation within the time window for acute stroke therapy

might change critical parameters for stroke size and neuronal survival including regional cerebral blood flow or regional oxygen demand^{4,5}. In this study our main goal is to evaluate the sociodemographic characteristics of acute stroke syndrome in children and effect of sensory stimulation for management of stroke.

Objective

General objective are to assess the sociodemographic characteristics of acute stroke syndrome in children and effect of sensory stimulation for management of stroke. Specific objective are to detect clinical characteristics of the patients and to identify GCS trend in Acute stroke syndrome.

Materials and Methods:

This randomized control trial study conducted at Magura Medical College Hospital, Magura from January 2021 to December 2023. Study population was a total 85 (eighty-five) children aged 02 months to 12 years having coma due to acute stroke syndrome was selected randomly and Sampling technique was purposive. Following inclusion criteria, 85 (eighty-five) comatose children were enrolled by purposive sampling technique. Then selected patients were randomized into study and control group by simple random sampling. The study group received standard care plus sensory stimulation & control group received no stimulation. In study group was 43 patients & 42 patients in control group. Children in study group were given sensory stimulation therapy while those in control group received no sensory stimulation. Tactile, Visual, auditory stimulation were given by specific coma kits.

Statistical Analysis: First data were edited to the validity and consistency of the data. After proper verification data were coded and entered into computer by using SPSS software programs. Descriptive analysis was done by percentage, mean and standard deviation. Association was observed by appropriate statistical test at 95% confidence interval e.g., odds ratio, Chi-square, t-test.

Result:

In figure-1 shows gender distribution of the patients where for both control and study group male patients were higher than female. The following figure is given below in detail:

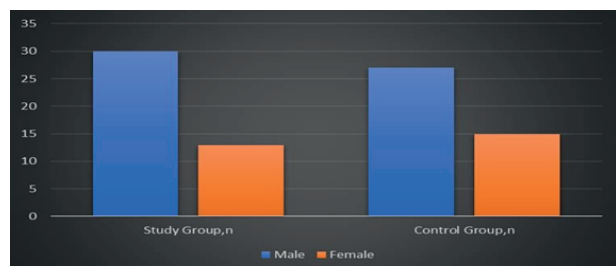


Figure-1: Gender distribution of the patients.

In table-I shows age distribution of the patients where most of the patients in study and control group belong to 2 months to 1 year's age group, (n=24) and (n=27). The following table is given below in detail:

Age group	Study group	Control group
2 months to 1 years	24	27
1 to 5 years	12	9
5 to 12 years	7	6

Table- I: Distribution of baseline characteristics of both study & control groups (N=85).

In figure-2 shows distribution of the patients according to residential area where in study & control group, 57% patients from urban and 43% from rural. The following figure is given below in detail:

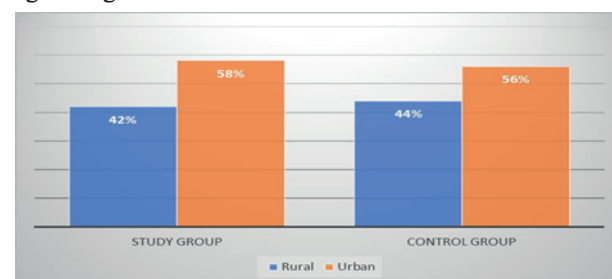


Figure-2: Distribution of the patients according to residential area.

In table-II shows distribution of the patients according to sociodemographic factors where only 25% parents were completed their graduation and most of them belong to poor economic condition. The following table is given below in detail:

Table-II: Distribution of the patients according to sociodemographic factors

Variable	Both Study & Control Group (%)
Economic condition of parents (taka):	
• Poor	60%
• Middle class	25%
• Upper class	15%
Occupation of patient's parents:	
• Housewife	25%
• Teacher	25%
• Service holder.	10%
• Businessman	35%
• others	5%
Education of patient's parents:	
• Illiterate	2%
• Primary	9%
• Secondary	23%
• Higher-secondary	41%
• Graduation or more	25%

In table-III shows clinical characteristics of the patients where

56% patients had ischemic stroke and 44% had hemorrhagic stroke. The following table is given below in detail:

Table-III: Clinical characteristics of the patients

Clinical characteristics	Both Study & Control Group (%)
Symptom:	
Seizures	32%
Sudden headaches	22%
Difficulty speaking	10%
Hemiparesis	20%
Sudden loss of vision	10%
Trouble walking	6%
Types of strokes: Ischemic stroke	76%
Hemorrhagic stroke	24%

In figure-3 shows GCS trend in Acute stroke syndrome where GCS score improved significantly after two weeks of sensory stimulation in acute stroke syndrome Cases. The following figure is given below in detail:

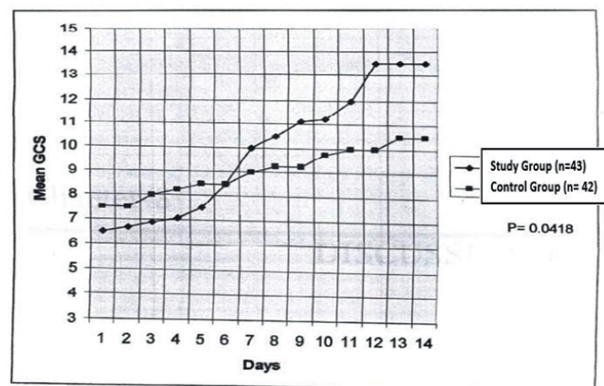


Figure-3: The GCS trend in Acute stroke syndrome.

Discussion:

The beneficial effects of cortical activation for functional recovery after ischemic stroke have been well described. However, little is known about the role of early sensory stimulation, i.e., stimulation during first 6 h after stroke onset even during acute treatment. In recent years, various preclinical studies reported significant effects of acute sensory stimulation that range from entire neuroprotection to increased infarct volumes by 30-50%. Systematic knowledge about the effect of acute sensory stimulation on stroke outcome is highly relevant as stroke patients are subject to uncontrolled sensory stimulation during transport, acute treatment, and critical care. One study reported that when they collected the clinical history, the physician should consider risk factors for pediatric stroke, investigating ethnic origin, familial history and in particular a positive family history for coagulopathies, and cerebrovascular, metabolic or immunologic diseases. Particular attention should be given in

the personal history to the presence of sickle cell disease or congenital heart disease, to a history of head or neck trauma, to unexplained fever and recent infections (especially chickenpox), vasculitis, drug ingestion and blood disorders. Another study reported that, the current treatment options for acute ischemic stroke are substantial but still limited. Thrombolysis therapy and more recently thrombectomy have demonstrated their potential to improve stroke outcome via early revascularization of occluded artery segments⁷.

Conclusions:

From our study we can say that, early sensory stimulation has been shown to have significant effects, both beneficial and detrimental, on stroke size and functional outcome. Further study is needed for better outcome.

References:

1. Dimyan MA and Cohen LG. Neuroplasticity in the context of motor rehabilitation after stroke. *Nat Rev Neurol*. 2011; 7: 76-85.
<https://doi.org/10.1038/nrneurol.2010.200>
PMid:21243015 PMCID:PMC4886719
2. Von Bornsta dt D, Houben T, Seidel JL, et al. Supply-demand mismatch transients in susceptible peri-infarct zones explain the origins of spreading injury depolarizations. *Neuron*. 2015; 85: 1117-1131.
<https://doi.org/10.1016/j.neuron.2015.02.007>
PMid:25741731 PMCID:PMC4351476
3. Frostig RD, Lay CC and Davis MF. A rat's whiskers point the way toward a novel stimulus-dependent, protective stroke therapy. *Neuroscientist*. 2013; 19: 313-328.
<https://doi.org/10.1177/1073858412462607>
PMid:23047156 PMCID:PMC3710106
4. Iadecola C. Neurovascular regulation in the normal brain and in Alzheimer's disease. *Nat Rev Neurosci*. 2004; 5:347-360.
<https://doi.org/10.1038/nrn1387>
PMid:15100718
5. Chen-Bee CH, Agoncillo T, Xiong Y, et al. The triphasic intrinsic signal: implications for functional imaging. *J Neurosci*. 2007; 27: 4572-4586.
<https://doi.org/10.1523/JNEUROSCI.0326-07.2007>
PMid:17460070 PMCID:PMC6673004
6. Baker WB, Sun Z, Hiraki T, et al. Neurovascular coupling varies with level of global cerebral ischemia in a rat model. *J Cereb Blood Flow Metab*. 2013; 33: 97-105.
<https://doi.org/10.1038/jcbfm.2012.137>
PMid:23032485 PMCID:PMC3597370
7. Heiss WD, Hayakawa T and Waltz AG. Cortical neuronal function during ischemia. Effects of occlusion of one middle cerebral artery on single-unit activity in cats. *Arch Neurol*. 1976; 33: 813-820.
<https://doi.org/10.1001/archneur.1976.00500120017003>
PMid:999544

Association of Chronic Stress with Cardiovascular Diseases: A Single Centre Experience

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Abstract:

Introduction: Cardiovascular diseases (CVD) pose a growing global health threat, with a 42.4% increase in deaths between 1990 and 2015 despite a 27.3% decline in age-standardized CVD mortality rates. Risk factors like smoking, inactivity, high blood pressure, obesity, hyperinsulinemia, hypercholesterolemia, and psychological stress contribute to CVD. **Aim of the study:** The study aims to assess the prevalence of stress and its association with cardiovascular diseases (CVD). **Materials and Methods:** This prospective study at Jessore Medical College and Hospital, Bangladesh, involved 110 patients aged 25-64 with cardiovascular diseases (CVDs) and chronic stress. The study duration was one year from January 2022 to December 2022. **Result:** The majority (54.55%) were aged 31-40, with females constituting 57.00% of the total sample. Work experience distribution revealed 50.91% with 1-10 years, 21.82% with 11-20 years, and 27.27% with over 20 years. Stress intensity analysis showed no mild stress, 71.82% with "Average to acute stress," 25.45% with "Average stress," and 2.73% with acute stress. Cardiovascular risk factors included 19.00% lacking sleep, 15.00% with low physical activity, and 12.00% each for smoking, hypercholesterolemia, and arterial hypertension. **Conclusion:** Research indicates that individuals experiencing stress face significant cardiovascular risk factors. However, the connections between stress and these risk factors appear complex and must be more apparent. This underscores the necessity for additional investigation into the relationship between stress and other cardiovascular risk factors while considering factors such as age, gender, and socio-economic characteristics within the population.

Keywords: Association, chronic stress, cardiovascular risk factors and cardiovascular diseases.

Number of Tables: 04; Number of Figure: 01; Number of References: 23; Number of Correspondences: 03.

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Introduction:

Cardiovascular diseases are one of the emerging global health concerns, and public health professionals now view them as a primary concern. Despite a drop of 27.3% in age-standardized CVD mortality rates during the past few decades, the number of deaths rose by 42.4% between 1990 and 2015¹. In industrialized

nations, cardiovascular illnesses account for almost 50% of all deaths². The existence of certain risk factors, such as smoking, inactivity, high blood pressure, obesity, hyperinsulinemia, and hypercholesterolemia, is strongly linked to the occurrence of cardiovascular diseases². It is becoming more well understood that psychological stress plays a significant role in cardiovascular disease and may be a modifiable risk factor³. Stress has an impact on cardiovascular health at various phases of the disease process, including the development of atherosclerosis and subclinical coronary heart disease (CHD) over time, the acute induction of cardiac events in patients with advanced CHD, and exposure to cardiovascular risk factors (such as the reduction in physical activity caused by stress). Furthermore, stress can deteriorate recovery and have a long-term negative impact on quality of life in those who have survived an acute coronary syndrome or stroke^{4,5}. The INTERHEART study, which involved a diverse sample of 24,767 individuals from 52 countries, revealed that experiencing stress increases the likelihood of acute myocardial infarction by twofold⁶. In a UK-based study, 134 South Asian men and women encountered higher levels of chronic stress, characterized by financial difficulties, crowded living conditions, family discord, social deprivation, and discrimination, compared to their European counterparts. Despite having larger social networks, South Asians experienced lower social support along with increased levels of depression and hostility. Consequently, the notable psychosocial challenges faced by the South Asian group, in contrast to Europeans, align with the observed heightened susceptibility to coronary artery disease (CAD) in this population⁷. An additional prospective investigation examining the impact of cumulative stress on cardiovascular risk reveals connections with factors such as age, ethnicity, marital status, along with habits like smoking and conditions like obesity, diabetes, depression, and anxiety⁸. While stress management is advised by certain recommendations for patients who are at high risk of cardiovascular disease (CVD), it is not yet recognized as a key preventive measure for the general public^{9,10}. Since chronic stress and stress-related disorders are becoming more common in modern society, it is vital to address the public health problems of identifying stress as an independent risk factor for CVD and developing innovative preventative methods¹¹. Nevertheless, until recently, there was not many research looking at the effects of stress on cardiovascular diseases, and the available data has long been insufficient. The study aims to assess the prevalence of stress and its association with cardiovascular diseases (CVD).

Materials and Methods:

This prospective study was conducted at the Department of Cardiology in Jessore Medical College and Hospital, Jessore, Bangladesh. A total of 110 patients were enrolled and analyzed in this study from January 2022 to December 2022. The questionnaire survey provided

information on socio-demographic characteristics (sex, age, education, marital status, employment), stress, behavioral habits (alcohol, smoking, lack of sleep, and low physical activity), history of CVD (arterial hypertension, coronary artery disease (CAD), cerebrovascular accident, diabetes mellitus), economic conditions (financial wealth), quality of life. Prior to inclusion in the study, written informed consent was obtained from all participants.

Inclusion criteria were patients aged from 25 to 64 years, both male and female patients, participants with a documented history of cardiovascular diseases, such as coronary artery disease, heart failure, stroke, or peripheral vascular disease and individuals experience chronic stress for six months or more and participants are willing to provide informed consent to participate in the study. **Exclusion criteria** were individuals experiencing acute stress without a history of chronic stress, participants with severe mental health disorders, such as schizophrenia or bipolar disorder, might confound the association between chronic stress and cardiovascular diseases, pregnant individuals, as pregnancy itself, can influence stress levels and cardiovascular parameters and individuals who decline or are unwilling to participate in the study despite meeting other inclusion criteria. The analysis of stress prevalence depending on the socio-demographic characteristics of the sample, presence of cardiovascular diseases, and CVR factors was carried out using Pearson's Chi-square test. Significant differences in stress prevalence depending on socio-demographic characteristics may affect the association of stress with CVDs and SSR factors. Logistic regression analysis was used to eliminate the modifying effect of socio-demographic characteristics. At the same time, the associations studied were adjusted for the impact of gender, age, employment, level of education, marital status, urban/rural residence, and financial well-being.

Result:

In this prospective study, a total of 110 patients were enrolled and studied. Table I presents the age distribution of the study population. The majority of 60(54.55%) individuals fell within the age range of 31 to 40 years, constituting the total sample. In contrast, the 20-30 age range accounted for 14.55% and 23(20.91%) were aged 4, respectively. Figure 1 illustrates the gender distribution within the study population. The data reveals a slightly higher representation of females, constituting 57.00% of the total sample, while males accounted for 43.00%. Table II provides a comprehensive overview of the distribution of work experience. The largest segment is represented by individuals with 1-10 years of work experience, constituting 56(50.91%) of the total sample. The second category, comprising those with 11-20 years of work experience, accounts for 21.82% of the study population, and the third category, individuals with over 20 years of work experience, represents 27.27% of the participants.

Table III outlines the distribution of stress intensity. Interestingly, none of the participants reported experiencing mild stress. The most prevalent category is "Average to acute stress," with a frequency of 79(71.82%) participants. The "Average stress" category represents 25.45% of participants, with 28 individuals falling into this group. A smaller percentage, 2.73%, reported experiencing acute stress. Table IV presents the distribution of cardiovascular risk factors. Notable findings include a prevalence of 19.00% for lack of sleep, 15.00% for low physical activity, and 12.00% for smoking, hypercholesterolemia, and arterial hypertension.

Table 1: Age distribution of the study population (N=110).

Age	Frequency (n)	Percentage (%)
20-30	16	14.55
31-40	60	54.55
41-50	23	20.91
51-60	11	10.00

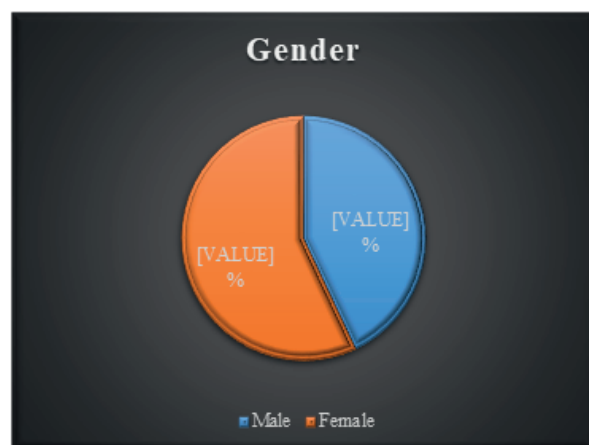


Figure 1: Gender distribution of the study population (N=110).

Table II: Distribution work experience of the study population (N=110).

Work experience	Frequency (n)	Percentage (%)
1-10	56	50.91
11-20	24	21.82
> 20	30	27.27

Table III: Patients stress intensity of the study population (N=110).

Stress intensity	Frequency (n)	Percentage (%)
Mild stress	0	0.00
Average stress	28	25.45
Average to acute stress	79	71.82
Acute stress	3	2.73

Table IV: Cardiovascular risk factors of the study populations.

Risk factors	Frequency (n)	Percentage (%)
Lack of sleep		
Yes	20	19.00
No	90	81.00
Low physical activity		
Yes	16	15.00
No	94	85.00
Smoking		
Yes	13	12.00
No	97	88.00
Alcohol		
Yes	10	9.00
No	100	91.00
Hypercholesterolemia		
Yes	13	12.00
No	97	88.00
Hyperglycemia		
Yes	4	4.00
No	106	96.00
Arterial hypertension		
Yes	10	9.00
No	100	91.00
Coronary artery disease		
Yes	6	6.00
No	104	94.00
Stroke		
Yes	2	2.00
No	108	98.00
Obesity		
Yes	8	8.00
No	102	92.00
Diabetes mellitus		
Yes	2	2.00
No	108	98.00

Discussion:

The research aimed to explore the association between stress and cardiovascular risk factors, mainly focusing on occupational stress. A notable prevalence of occupational stress was identified within the study group with a working tenure of 1-10 years. In a prior investigation, 68% of participants were classified in a medium-to-high-stress category¹². In the present study, 71.82% reported experiencing average and acute stress, yet no statistically significant variations were detected in cardiovascular disease risk factors. Potential reasons for this lack of significance include the study's brief duration, insufficient

consideration of stress effects over an extended period, and the relatively young age of participants. Contrary findings reported no significant correlation between cardiovascular disease risk factors and work stress; this study revealed a positive but non-significant association between smoking and occupational stress¹³. These findings also align with previous studies¹⁴. While Belkic et al. (2004) established a significant link between cardiovascular disease risk factors and work stress¹⁵, Demiral et al.'s results in 2006 did not confirm these findings¹⁶. Another noteworthy discovery was a significant relationship and robust correlation between work stress and blood glucose levels. Golmohammadi reported a similar association in diabetic patients¹⁷. However, a direct comparison between their results and ours is challenging due to the differing assessment tools employed in the studies. No significant correlation was observed between occupational stress and changes in blood lipid profiles, and the positive correlation detected was weak. Our study findings show similarity with various studies, where there is no significant link between stress and blood cholesterol^{18,19}. Similarly, Kobayashi (2005) and Yadegarfar et al. (2010) reported no significant association between occupational stress and blood triglycerides^{20,21}. Despite discrepancies with Kobayashi's study, which did find a significant relationship between blood cholesterol and stress²¹, variations may stem from differences in methodology and study group composition. Although participants reported a high rate of diastolic blood pressure, no significant associations were identified between diastolic blood pressure and occupational stress. Another study found no correlation between occupational stress and cardiovascular disease risk factors despite their study participants' high-stress prevalence²². The study revealed that drivers worked an average of 13.62±3.64 hours per day, potentially contributing to elevated occupational stress. This finding is comparable with a previous study, indicating a link between occupational stress and extended working hours²³.

Conclusion and Recommendations:

This study investigated the association between chronic stress and cardiovascular diseases (CVD) among 110 patients in Jessore, Bangladesh. Despite a high prevalence of average to acute stress, no statistically significant variations in cardiovascular risk factors were observed, possibly due to the study's brief duration and the relatively young age of participants. Noteworthy was the positive but non-significant association between smoking and occupational stress, aligning with prior research. A significant relationship between work stress and blood glucose levels was identified, echoing previous findings. However, no significant correlations were found for blood lipid profiles or diastolic blood pressure. The study emphasizes the complexity of stress-CVD relationships and calls for further exploration. Given the growing

significance of chronic stress in modern society, further longitudinal studies with diverse populations are crucial to understanding its nuanced impact on cardiovascular health.

Conflict of Interest: None.

References:

1. Low Wang CC, Hess CN, Hiatt WR, Goldfine AB. Clinical update: cardiovascular disease in diabetes mellitus: atherosclerotic cardiovascular disease and heart failure in type 2 diabetes mellitus-mechanisms, management, and clinical considerations. *Circulation*. 2016 Jun 14;133(24):2459-502.
<https://doi.org/10.1161/CIRCULATIONAHA.116.022194>
PMid:27297342 PMCID:PMC4910510
2. Pagliaro BR, Cannata F, Stefanini GG, Bolognese L. Myocardial ischemia and coronary disease in heart failure. *Heart Failure Reviews*. 2020 Jan;25(1):53-65.
<https://doi.org/10.1007/s10741-019-09831-z>
PMid:31332663
3. Shah MS, Brownlee M. Molecular and cellular mechanisms of cardiovascular disorders in diabetes. *Circulation research*. 2016 May 27;118(11):1808-29.
<https://doi.org/10.1161/CIRCRESAHA.116.306923>
PMid:27230643 PMCID:PMC4888901
4. Chan JC, Malik V, Jia W, Kadowaki T, Yajnik CS, Yoon KH, et al. Diabetes in Asia: epidemiology, risk factors, and pathophysiology. *Jama*. 2009 May 27;301(20):2129-40.
<https://doi.org/10.1001/jama.2009.726>
PMid:19470990
5. Hotta N, Nakamura J, Iwamoto Y, Ohno Y, Kasuga M, Kikkawa R, Toyota T. Causes of death in Japanese diabetics: a questionnaire survey of 18,385 diabetics over a 10-year period. *Journal of diabetes investigation*. 2010 Feb;1(1-2):66-76.
<https://doi.org/10.1111/j.2040-1124.2010.00019.x>
PMid:24843411 PMCID:PMC4020680
6. Agarwal A, Gossain VV. Diabetes in the Elderly. *Drugs in Diabetes*. 2021 May 31:183.
7. McAloon CJ, Osman F, Glennon P, Lim PB, Hayat SA. Global epidemiology and incidence of cardiovascular disease. In *Cardiovascular Diseases*. Academic Press. 2016 Jan 1 (pp. 57-96).
<https://doi.org/10.1016/B978-0-12-803312-8.00004-5>
8. Kannel WB, McGee DL. Diabetes and cardiovascular disease: the Framingham study. *Jama*. 1979 May 11;241(19):2035-8.
<https://doi.org/10.1001/jama.241.19.2035>
PMid:430798
9. Grundy SM, Benjamin IJ, Burke GL, Chait A, Eckel RH, Howard BV, et al. Diabetes and cardiovascular

disease: a statement for healthcare professionals from the American Heart Association. *Circulation*. 1999 Sep 7;100(10):1134-46.

<https://doi.org/10.1161/01.CIR.100.10.1134>

PMid:10477542

10. Kim JA, Koh KK, Quon MJ. The union of vascular and metabolic actions of insulin in sickness and in health. Arteriosclerosis, thrombosis, and vascular biology. 2005 May 1;25(5):889-91.

<https://doi.org/10.1161/01.ATV.0000164044.42910.6b>

PMid:15863720

11. Kaur J, Singh P, Sowers JR. Diabetes and cardiovascular diseases. *American Journal of therapeutics*. 2002 Nov 1;9(6):510-5.

<https://doi.org/10.1097/00045391-200211000-00009>

PMid:12424509

12. Rahmani A, Farjami A, Mahmudkhani S, Gharagozlo F, Ahmadnezhad I, Karchani M, et al. Determination of job stresses and their consequences in drivers in Ilam. *Electron Physician*. 2013;5(1):594-8.

13. Pelfrene E, De Backer G, Mak R, De Smet P, Kornitzer M. Job stress and cardiovascular risk factors. *Arch Public Health*. 2002;60:245-68.

14. Kouvonen A, Kivimäki M, Virtanen M, Pentti J, Vahtera J. Work stress, smoking status, and smoking intensity: An observational study of 46190 employees. *J Epidemiol Community Health*. 2005;59(1):63-9.

<https://doi.org/10.1136/jech.2004.019752>

PMid:15598729 PMCID:PMC1763376

15. Belkic K, Landsbergis PA, Schnall PL, Baker D. Is job strain a major source of cardiovascular disease risk? *Scand J Work Environ Health*. 2004;85-128.

<https://doi.org/10.5271/sjweh.769>

PMid:15127782

16. Demiral Y, Soysal A, Can Bilgin A, Kiliç B, Unal B, Uçku R, et al. The association of job strain with coronary heart disease and metabolic syndrome in municipal workers in Turkey. *J Occup Health*. 2006;48(5):332-8.

<https://doi.org/10.1539/joh.48.332>

PMid:17053299

17. Golmohammadi R, Abdulrahman B. Relationship between occupational stress and non-insulin-dependent diabetes in different occupation in Hamadan (West of Iran). *J Med Sci*. 2006;6(2):241-4.

<https://doi.org/10.3923/jms.2006.241.244>

18. Su C-T. Association between job strain status and cardiovascular risk in a population of Taiwanese white-collar workers. *Circ J*. 2001;65(6):509-13.

<https://doi.org/10.1253/cj.65.509>

PMid:11407732

19. Netterstrøm B, Kristensen TS, Damsgaard MT, Olsen O, Sjørl A. Job strain and cardiovascular risk factors: A cross sectional study of employed Danish men and women. *Br J Ind Med*. 1991;48(10):684-9.

<https://doi.org/10.1136/oem.48.10.684>

PMid:1931727 PMCID:PMC1012061

20. Kobayashi Y, Hirose T, Tada Y, Tsutsumi A, Kawakami N. Relationship between two job stress models and coronary risk factors among Japanese part-time female employees of a retail company. *J Occup Health*. 2005;47(3):201-10.

<https://doi.org/10.1539/joh.47.201>

PMid:15953841

21. Yadegarfar G, Alinia T, Gharaaghaji Asl R, Allahyari T, Sheikhabgloo R. [Assessing the relationship between occupational stress and risk factors of cardiovascular in the Urmia petrochemical company employees]. *J Isfahan Med Sch. Persian*. 2010;28(112):645-60.

22. Franke WD, Kohut ML, Russell DW, Yoo HL, Ekkekakis P, Ramey SP. Is job-related stress the link between cardiovascular disease and the law enforcement profession? *J Occup Environ Med*. 2010;52(5):561-5.

<https://doi.org/10.1097/JOM.0b013e3181dd086b>

PMid:20431405

23. Uehata T. Long working hours and occupational stress related cardiovascular attacks among middle-aged workers in Japan. *J Hum Ergol*. 1991;20(2):147-53.

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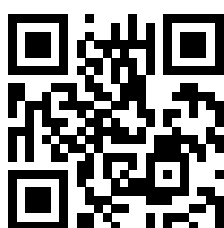
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