ISSN 1815-3100 (Print)

2408-8625 (online)

JOURNAL OF DHAKA NATIONAL MEDICAL COLLEGE & HOSPITAL

j.Dhaka Natl. Med. Coll. Hosp. Volume-30, Number 1, March 2024

Journal of Dhaka National Medical College & Hospital
Volume - 30 No. 1 March, 2024

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Editorial

Vitamin D deficiency & Coronary Artery Disease

Coronary artery disease (CAD) is one of the most public health problems throughout the world. Now it is considered as the leading cause of mortality and morbidity worldwide.[1] Like other South Asians, Bangladeshi population are unduly prone to develop CAD, which is often premature in onset, rapidly progressive and angiographically more severe.[2] The underlying pathophysiology of CAD is poorly understood. The 'classic' risk factors like diabetes mellitus, hypertension, dyslipidemia, obesity, smoking and excessive alcohol consumption undoubtedly play important role. Poor dietary habits, excess intake of saturated and trans fat, high salt intake, and lack of physical activity also play important role.Beside conventional risk factors and genetic predisposition, some emerging new risk factors like hypovitaminosis D, arsenic contamination, particulate matter air pollution may play vital role.[3]

There is an unique role of vitamin D on calcium homeostasis and it has beneficial anti-inflammatory and antiatherosclerotic effects.Vitamin D is also involved in glycemic control, lipid metabolism, regulate insulin secretion and sensitivity.The antihypertensive properties of vitamin D include suppression of the renin-angiotensin-aldosterone system. It has renoprotective effects, having direct effects on endothelial cells, inhibit the growth of vascular smooth muscle cells, prevent secondary hyperparathyroidism and it has also beneficial effects on cardiovascular risk factors.[4]

The exact relationship between hypovitaminosis D and increased cardiovascular risk has not yet been established, multiple hypotheses have been postulated. Vitamin D receptors (VDRs) have been distributed widely throughout the cardiovascular system.[5] Vitamin D acts via this receptors and reduces cardiac ischemia-reperfusion injury and reactive oxygen species.It also shows favorable effects on inflammation and thrombosis.Atherosclerosis, chronic inflammation, endothelial dysfunction and arterial calcification occur due to hypovitaminosis D.Moreover, vitamin D insufficiency may activate the renin angiotensin system and increase insulin resistance, endothelial dysfunction, inflammation, platelet function, and blood pressure (BP) regulation.[6] An experimental trial revealed that vitamin D supplementation suppressed vascular inflammation by inhibiting the Nuclear Factor-κB (NF-κB) pathways and decreasing the process of atherosclerosis and hence subsequent Coronary artery disease (CAD).[7]

The association of vitamin D deficiency with coronary artery diseases (CADs) have been investigated in many studies. In a multicenter US cohort study evaluating patients admitted with acute coronary syndrome (ACS), about 95% of patients were found to have low vitamin D levels.[8] In a case-control study (n = 240), Roy et al. reported that severe vitamin D deficiency was associated with increased risk of acute myocardial infarction after adjusting for risk factors.[9]

A prospective nested case-control study was conducted between 1993 and 1999 of 18,225 US men (Health Professionals Follow-Up Study) and this study revealed that vitamin D deficiency was associated with a higher risk of myocardial infarction in comparison with sufficient 25(OH)D after multivariate adjustment.[10]

Vitamin D deficiency is an emerging risk factor for coronary artery disease, in addition to conventional and genetic risk factors. Estimation of serum vitamin D level, genotyping for vitamin D receptor variants, estimation of serum calcium and phosphates level and bone mineral density are mandatory to evaluate the patients with cardiovascular disease. Regular screening, monitoring and treating of vitamin D should be taken to reduce cardiovascular morbidity and mortality.

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Journal of Dhaka National Medical College & Hospital

JDNMCH Volume - 30 Number -1, March- 2024

TABLE OF CONTENTS

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Each of the following section should begin on separate page-

- Title page
- Abstract
- Text (Introduction, Materials and method, Results, Discussion). Insert tables and legends where they fit.
- Acknowledgement (if applicable).
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Abstract

May be structured with subheadings of Background Objective, Materials and Method, Results, Conclusion. Not mandatory for review articles and case reports.
Should not exceed 250 words.
Three to five keywords below the abstract may be used.

Text

Introduction

States the purpose of the article and summarizes the rational of the study.
Brief review of the subject.

Materials and method

Should be very clear mentioning study design, place and period.
The selection criteria of the study population including controls (if any).
The methods and the apparatus used in the research.
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Presented in sequence in the text, tables and illustrations.
Describe without comment.
Supplemented by concise texual description of the data presented in table and figures only where it is necessary.

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Tables should be simple, self explanatory and supplement, not duplicate the text.

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All illustrations must be numbered and cited in the text.

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Should reflect the authors' comment on the results and to relate them to those of other authors.

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 07-12

Original Article

Effectiveness of different tests in the diagnosis of Ocular Myasthenia gravis

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Abstract

Background: Myasthenia gravis (MG) is an autoimmune neuromuscular disease leading to fluctuating muscle weakness and fatigue. Diagnostic tests include serum acetylcholine receptor antibody levels, Single fiber electromyography (SFEMG), Repetitive Nerve Stimulation (RNS) test, Neostigmin test, the sleep test, the rest test and the Ice pack test.

Objectives: To evaluate the importance and effectiveness of Ice pack test, Neostigmin test and RNS(Repetitive nerve stimulation test) in diagnosis of Myasthenia Gravis.

Materials and Methods: A hospital basedprospective observational study was done in the Neuro-ophthalmology department in National Institute of Ophthalmology & Hospital, Dhaka(January 2014 to December 2014) among 30 patients who came with complaints of variable amount of ptosis and diplopia attending the neuro-ophthalmology department of NIO & H and who provided written informed consent were enrolled in the study. Those who came with any other ocular pathology or history of previous ocular surgery were not included in this study. The variable includes in this study were Gender, Age, Amount of ptosis, LPS function, Margin reflex distance, Ocular motility tests. We have performed the Ice pack test, then with proper arrangements Neostigmine test have been done in operation theater having emergency resuscitation and finally we refer all those patients to NINS & H (National Institute of Neuroscience & Hospital) for doing RNS (Repetitive nerve stimulation test), as our hospital does not have the facility for doing RNS test.

Results: Mean age was 31.72±6.46 years. Male preponderance was seen (56.67% of the cases). Most of the patients among them were within the age group of 11-20 years of age (40%). Ice pack tests was positive for 28 patients (93.33%) among 30 patients. Neostigmin test was also positive for 27 patients (90%) among of 30 patients. RNS test was positive only for 9 patients (32.1%). RNS test could not performed by 2 patients who were 5 & 6 years old respectively.

Conclusion: Most cases of clinically diagnosed Myasthenia gravis was positive by Ice pack tests (sensitivity 93.33%) and Neostigmin test (Sensitivity 90%).But RNS test was positive only those have systemic involvement or general Myasthenia Gravis (sensitivity 31.2%). So, it is not so effective test for diagnosis of ocular myasthenia gravis.

Key words: Ptosis, Diplopia, Myasthenia Gravis, Ice pack test, Neostigmintest, RNS (Repetitive nerve stimulation test).

Introduction

Myasthenia gravis (MG) is an autoimmune neuromuscular disease leading to fluctuating muscle weakness and fatigue. It is an autoimmune disorder, in which weakness is caused by circulating antibodies that block acetylcholine receptors at the postsynaptic neuromuscular junction.[1] inhibiting the excitatory effects of the neurotransmitter acetylcholine on nicotinic receptors throughout neuromuscular junctions. Ptosis, however, may be caused by a variety of disorders, so the distinction between myasthenic and nonmyasthenic ptosis is critical.[2] Myasthenia Gravis should be considered in every patient with ptosis and/or diplopia.[3]

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Received: 25.09.2023 **Accepted:** 13.12.2023

Patients in between the age group (15-50) years are affected by MG. Female are more affected than male in younger patients. But alternatively in elder patients male are more affected.[4]

Diagnostic tests include serum acetylcholine receptor antibody levels, Single fibre electromyography (SFEMG), Repetitive Nerve Stimulation (RNS) test, Neostigmin test, the sleep test, the rest test and the Ice pack test.

A quick bedside technique for diagnosing Myasthenia Gravis is the Ice Test.[2,5] Ice pack test is a simple diagnostic test that can be done in the clinic as an outpatient department procedure. It is highly sensitive and specific for Myasthenia Gravis. An ice pack is applied to the affected upper eyelid for 2 minutes. A positive test is the improvement of ptosis by > 2mm or more.The improvement of Myasthenia gravis with cooling probably occurs by lesser acetyl cholinesteraseactivityin temperature below 28°C, providing increasing amount of acetylcholine molecules in the synaptic cleft.[6]

This prospective observational study have done among 30 patients with for the period of one year (from January, 2014 to December 2014) in the department of Neuro-ophthalmology, National Institute of Ophthalmology and Hospital, NIO & H. It also includes demographic data of patients. With all ethical clearance, data have been collected with a preformed questionnaire. Data have been checked, cleaned and edited properly before analysis. Statistical analysis has been carried out by using v16.0 Windows statistical software. Descriptive statistics is used for the interpretation of the findings. There are few studies in world literature has been done on this subject.

Materials & Methods

A hospital based prospective observational study was done in the Neuro-ophthalmology department in National Institute of Ophthalmology & Hospital, Dhaka(January 2014 to December 2014) among 30 patients who came with complaints of variable amount of ptosis and diplopia attending the neuro-ophthalmology department of NIO & H and who provided written informed consent were enrolled in the study. Those who came with any other ocular pathology or history of previous ocular surgery were not included in this study. The variable includes in this study were Gender, Age, Amount of ptosis, LPSfunction, Margin reflex distance, Ocular motility tests.

All patients with ptosis and diplopia underwent for complete history and proper evaluation, general, systemic and ocular examinations. Emphasis was given on visual acuity, amount of ptosis, LPSfunction, margin reflex distance, Fatigabilitytest, Cogan lid twitch sign, Ocular motility test, Tonometry (IOP), cranial nerve examination requireinvestigations, Complete blood count, ESR, Blood sugar, Serum creatinine, VDRL, Fasting Lipid profile, Xray chest (P/A view), ECG was also done.

Ice in between (0 to 4°) centigrade is placed over the closed eyelids for 2 minutes.Before doing Ice pack test, MRD (margin reflex distance), LPS (Levator palpebrae superiosis) function. Palpebral fissure height (PFH) and amount of ptosis is measures and photograph is also taken for documentation. If ptosisimproves by 2 mm or more, then Ice test is considered as 'Positive'.

Before doing Neostigmine test, all the patients were evaluated properly for systemic diseases and patients were sent to Anaesthesia department. NIO & H for general anaesthesia fitness. Counselling was done to all patients about the procedure, side effects and results.

After doing general anaesthesia fitness from anaesthesia department, a written informed consent is taken and patient is sent to operation theatre with resuscitation facilities for the examination procedure.

Weights of the patients were measured and I.V cannula was inserted for emergency resuscitation. Neostigmine methyl Sulphate (0.03 mg/kg body weight) and Atropine Sulphate (0.01 mg/kg body weight) was taken in 5cc disposable syringe.The medicine was injected in gluteal muscle (intramuscularly).

Before doing Neostigmine test, MRD (margin reflex distance), LPS (Levator palpebrae superiosis) function. palpebral fissure height (PFH) and amount of ptosis were measures and photograph was also taken for documentation. After injection, the aforesaid parameters were remeasured with 10 minutes interval for upto one hour with photographs (for documentation). Improvement of ptosis 2 mm or more is considered 'Positive Neostigmine test'.

We referred all those patients to NINS & H (National Institute of Neuroscience & Hospital) for doing RNS (Repetitive nerve stimulation test), as NIO & H did not have the facility for doing RNS test at that time.

In RNS test, few muscles are usually examined, those are Trapezius, Biceps, Deltoid, EPB (Extensor pollicis brevis), Nasalis, Orbicularisoculi, ADM (Adductor digit minimi), APB (Abductor pollicis brevis). A train of 5 to 10 stimuli

is delivered at a rate of 2 to 3 Hz. A decrement greater than 10% is abnormal and suggesting neuromuscular junctional disorder like Myasthenia gravis.

Results

Thirty patients were enrolled in this study who came with the complaints of ptosis diplopia in the Neuro-ophthalmology department of National Institute of Ophthalmology & Hospital, Dhaka during the study period.

Table-I: Characteristics of patients enrolled into the study at baseline

Characteristics	Frequency	Percentage (%)	p-value
Gender[a]			
Male	17	56.67%	$\chi2$= 0.533
Female	13	43.33%	df=1
Total	30	100.0%	p = 0.465ns
Agegroup[a]			
01-10 years	04	13.33%	
11-20 years	12	40.00%	$\chi2$= 0.17.0
21-30 years	08	26.67%	df=5
31-40 years	01	3.33%	p = 0.003*
41-50 years	02	6.67%	
51 and above	03	10.00%	
Mean age (Mean±SD)	24.03± 13.50 (5-55)		

[a]p value reached from Pearson's chi-square goodness-of-fit test,

*=significant, ns= Not significant

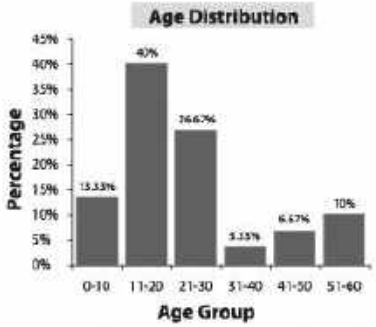

Figure-I: Age distribution of the study subjects.

Figure shows those highest percentage age groups were in between (11-20) years 40% and lowest were (31-40) years 3.33%.

Figure-II: Gender Distribution of study subject.

Figure shows that there were 17 male (56.67%) and 13 female (43.33%) were suffering from variable amount of ptosis and diplopia.

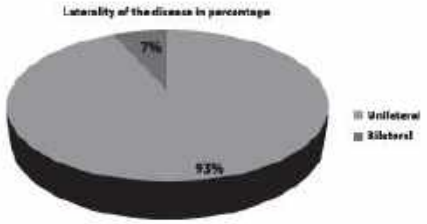

Figure-III: shows the comparison of involvement of eyes in different patients.

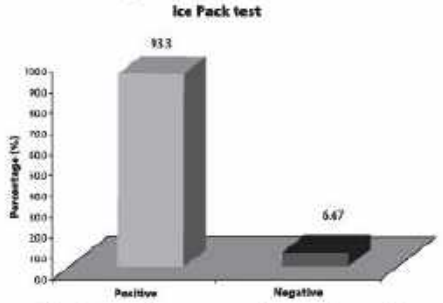

Figure-IV: shows the comparison of positive and negative results of Ice test.

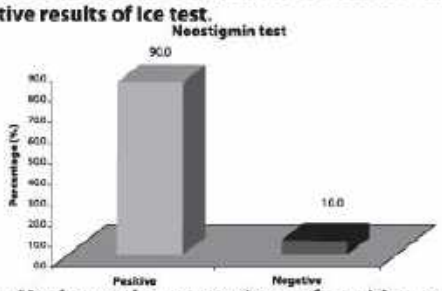

Figure-V: shows the comparison of positive and negative results of Neostigmin test.

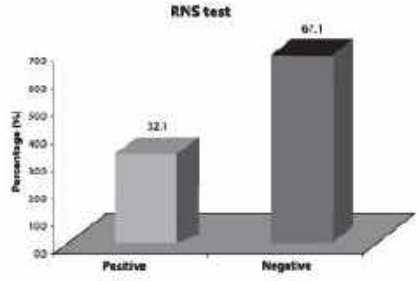

Figure-VI: shows the comparison of positive and negative results of RNS test.

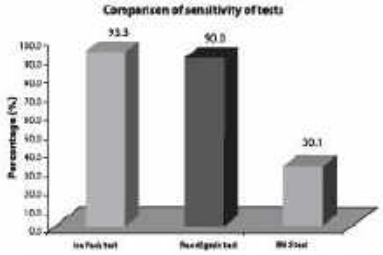

Figure-VII: Comparison of sensitivity of different tests.

The figure shows that among 30 patients, Ice test was positive in 28 patients (93.33%), Neostigmin test was positive in 27 patients (90%), and RNS test was positive for 09 patients (32.10%).

Table-II: Comparison of results of different tests.

No of patients	Positive		Negative		p-value
	No.	%	No.	%	
Ice Pack test	28	93.33%	02	6.67%	χ^2= 22.53 df=1 p<0.001*
Neostigmin test	27	90.0%	03	10.0%	χ^2= 19.20 df=1 p<0.001*
RNS test	09	32.1%	19	67.9%	χ^2= 3.57 df=1 p =0.06ns

p-value reached from Pearson's chi-square goodness-of-fit test, *=significant, ns=non significant.

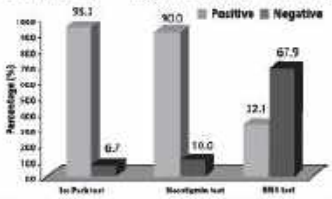

Figure-VIII: shows comparison of different test with their positive and negative results

Discussion

Myasthenia gravis may have systemic manifestations, ophthalmic manifestations or both. It may present with only ocular findings and then progress to generalized involvement. The differential diagnosis of ocular myasthenia includes ocular myopathy, muscular dystrophies, myotonic dystrophy, oculopharyngeal dystrophy, Lambert-Eaton myasthenic syndrome, botulism, Miller Fisher syndrome, intracranial lesions, mitochondrial myopathies including chronic progressive external ophthalmoplegia and Kearns-Sayre syndrome, thyroid eye diseases, drug-induced myasthenia, andtraumatic and aponeurotic ptosis.[7]

Diagnostic tests for MG include the sleep test, the rest test, the Tensilon test, the acetylcholine receptor antibody assay, muscle biopsy, RNS (Repetitive nerve stimulation) test, SFEMG (Single fiber electromyography) and the Ice pack test. Simpson first described the effects of temperature in MG in 1960.[8]

Bronestein and Desmedt showed that the local cooling improved myasthenic neuromuscular block, whereas warming had the opposite effect.[9] It is believed to affect the neuromuscular junction both by decreasing cholinesterase activity and by prompting efficacy of acetylcholine at eliciting depolarizations at the end plate. In our study we have shown that Ice test having some cooling effect, that means some change in temperature have some effect on improvement of ptosis in patients of MG. Ertaset al. in 1994 evaluated the ice test in 12 subjects with myasthenic ptosis and 15 control subjects. None of the control patients improved, whereas all patients (100%) with MG improved.[10]

Golink and coworkers confirmed previous findings regarding the ice test by showing improvement in ptosis of at least 2 mm in 16 of 20 patients with MG, with less than 0.5 mm of improvement in 20 control subjects, yielding a sensitivity of 80% and specificity of 100% if a positive test was defined as improvement of ptosis greater than or equal to 2 mm.[11]

Saavedra and coworkers in 1979 first described a cold test for MG used in evaluation of ptosis. They reported that myasthenic ptosis improved transiently in six patients after application of ice to the eye for 5 to 10 minutes. Two patients with nonmyasthenic ptosis did not improve.[12]

Sethi et al. in 1987 applied ice to a ptotic eyelid of 10 patients with MG and 7 without MG with the use of ice; 8 of the 10 subjects with MG had improvement in their ptosis. None of the subjects in the control group showed any improvement in their ptosis with the ice test.[13] In our study, it has been found that Ice pack kept over the closed ptotic eyelids for about 2 minutes and then evaluated and here among the 30 patients 28 patients have ptosis improvement after application of cold, non myasthenic ptosis did not improve. The result has similiarities with the previous study.

In our study the Ice test was positive for 28 patients among 30 patients. The sensitivity of the test was 93.33% and negative 6.67%. This result has similiarity with other studies[10-12] which have been done previously. Two patients were ice test negative, may be due to severe ptosis.

Tabassi et al, in 2005 showed that in their study, female were more affected by Myasthenia Gravis, 92 out of 156 patients (59%) and male 64 (41%)[14], whereas in our study we found an opposite scenario, male were more affected 17 out of 30 (56.67%) and female (43.33%) which was statistically insignificant (p=0.465). This difference may be due to female patients in our country deprived of proper treatment.

The mean age of the patients included in this study was 24.03 ± 13.50 years (range 05- 55 years) but in other study it was 29.32 years (range 3 to 75 years)[14]. The highest incidence (40%) was in between age group (11-20)years.The result was statistically significant (p= 0.003).

The sensitivity of Ice test in our study was statistically significant (p< 0.001), which corresponds with other studies.[14]

In case of Neostigmintest, it was positive in 90% case and negative 10%. The result is statistically significant (p< 0.001), The result corresponds with other study where it is positive in 91% case.[15]

In Repetitive nerve stimulation test, it was positive only 32.1% case and negative (67.9%) for rest of the case. The result was statistically insignificant (p= 0.06). The result also corresponds with other study where RNS was positive 76% for generalized MG and 48% for ocular MG.[15] Most of the patients in our studyhad unilateral involvement of ptosis (93%), in comparison to bilateral involvement (07%).

Conclusion

Most cases of Myasthenia gravis was positive (sensitivity 93.33%) by Ice pack test. So, Ice pack test is a very sensitivity, non-invasive, cost effective, bed side test for the diagnosis of Ocular Myasthenia Gravis. Most cases of clinically diagnosed Myasthenia gravis was positive by Neostigmintests (Sensitivity 90%). But there are some difficulties in performing the test as life support facilities, cardiac and systemic evaluations etc. Bradycardia, nausea, vomiting, abdominal cramping are common side effects of this test. But RNS (Repetitive nerve stimulation test) test was positive only those have systemic involvement or general Myasthenia Gravis (sensitivity 31.2%). So it is not so effective test for diagnosis of ocular myasthenia gravis.

Limitation:

A limitation of our study was small populations(30 patients).

Acknowledgments:

Authors of this study are thankful to the authority of the Department of Opthalmology and other Departments of Gazi Medical College & Hospital, Khulna for their nice cooperation during sample collection, laboratory procedure.

Conflict of interest: None

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 13-16

Original Article

Measurement of C-reactive protein in pulmonary tuberculosis patients without treatment and healthy individual

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Abstract

Objective: To assess the C-reactive protein level in pulmonary tuberculosis patients without treatment and healthy individual.

Methods: A descriptive, cross sectional study was conducted from January 2016 to June 2016 among 50 pulmonary tuberculosis patients attending at Respiratory Medicine Department of the Dhaka Medical College Hospital and 50 healthy individuals, after obtaining requisite consent from the patients. Data were collected through the interviewing of the patients. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the C-reactive protein level in pulmonary tuberculosis patients and healthy individuals. The study was approved by the institutional ethical committee.

Results: In a pool of 50 pulmonary tuberculosis patients without treatment and 50 healthy individuals, Serum CRP level (mg/l) were significantly higher ($p < 0.001$) in PTB than normal individuals.

Conclusion: Serum CRP level was significantly higher ($p < 0.001$) in pulmonary tuberculosis patients without treatment. So measurement of CRP level during pulmonary tuberculosis is an important diagnostic and prognostic tools.

Keywords: Tuberculosis patient, Serum CRP level.

Introduction

Tuberculosis (TB) is a major pubqd 350,000 Bangladeshi developed TB in 2013 and around 80,000 die from TB every year, which accounts for just under 9% of the deaths in Bangladesh every year. Hence, every hour, nine people die of TB in Bangladesh, despite an effective treatment being available.[1] Tuberculosis is caused by two organisms namely Mycobacterium tuberculosis and Mycobacterium bovis. It typically affects the lungs (pulmonary TB) but can affect other sites as well (extra pulmonary TB). It is characterized by persistent cough, difficulty in breathing, coughing up blood, general body weakness, loss of appetite, night sweats, fever, chills, unintentional weight loss etc. In 17th and 18th centuries, tuberculosis caused up to 25% of all deaths in Asia.[2] C-reactive protein is an inflammatory marker whose concentration increases with acute or chronic inflammation. It is produced by the liver in response to stimulation by cytokines such as interleukin-1 beta, interleukin-6, and tumor necrosis factor alpha. High-sensitivity measurement of CRP has been shown to add prognostic information at all levels of risk, but CRP has not been consistently shown to be an independent risk factor across all studies.[3] CRP is an acute-phase protein and nonspecific marker of systemic inflammation.[4]

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Received: 15.05.2023 **Accepted:** 18.01.2024

Materials & Methods

A cross sectional study was conducted in the Department of Biochemistry, Dhaka Medical College, Dhaka from January 2016 to December 2016.

According to selection criteria 100 subjects were selected with the age ranging from 20 to 60 years and equally divided into two groups. Group-A was newly diagnosed pulmonary tuberculosis patients before receiving treatment in the TB center of Department of Respiratory medicine, Dhaka medical college hospital and Group-B was apparently healthy volunteers. The study parameters are serum CRP level, BMI and blood pressure. Departmental screening committee of Department of Biochemistry, Dhaka Medical College Hospital, Dhaka provided approval before conducting the study. There are no violations of moral and ethical norms during preparation of this research. Purposive sampling was adopted for collecting data. The interviews were held directly in the corridor just outside the Outpatient Department. The relevant information was entered into the predesigned proforma. The collected data were entered into the computer and analyzed by using SPSS (version 20.1).

Result

Table-I shows that age (mean ± SD) and gender of PTB patients without treatment and healthy individuals. Study subjects were age & gender matched.

Table-I: Age and sex of study subjects in different groups (N = 100)

	Group		p-value
	Group-A (n=50)	Group-B (n=50)	
Age in years (Mean ± SD)	36.5 ± 9.28	37.2 ± 7.5	0.719 [a]
Gender			
Male n (%)	28 (56.0)	26 (52.0)	0.722 [b]
Female n (%)	22 (44.0)	24 (48.0)	

Group A: PTB patients without treatment
Group B: Healthy individuals
Level of significance $p < 0.05$
a = ANOVA test was done
b = Chi-square test was done

Table-II shows mean ± SD of systolic BP and diastolic BP, there was no significant difference of SBP and DBP in between groups.

Table-II: Blood pressure of study subjects in different groups (N= 100)

	Group		p-value
	Group-A (n=50)	Group-B (n=50)	
Systolic BP in mm of Hg (Mean ± SD)	121.8 ± 17.5	120.3 ± 16.7	0.885
Diastolic BP in mm of Hg (Mean ± SD)	79.5 ± 14.5	78.1 ± 12.3	0.798

Group A: PTB patients without treatment

Group B: Healthy individuals

Level of significance $p < 0.05$

ANOVA test was done

Table-III shows Mean ± SD of BMI was significantly lower in PTB patients without treatment and normal healthy individuals.

Table-III: BMI of the study subjects in different groups (N=100)

Parameter BMI in kg/m²	Group		p-value
	Group-A (n=50)	Group-B (n=50)	
Mean ± SD	18.5 ± 2.8	23.4 ± 3.5	< 0.05

Group A: PTB patients without treatment

Group B: Healthy individuals

Level of significance $p < 0.05$

ANOVA test was done

Table-IV shows serum CRP level in study subjects. Mean ± SD of serum CRP level was significantly higher in TB patients without treatment than healthy individuals.

Table-IV: Serum CRP level of the study subjects in different groups (n=100)

Parameter Serum CRP in mg/l	Group		p-value
	Group-A (n=50)	Group-B (n=50)	
Mean ± SD	22.3 ± 4.8	0.6 ± 0.05	< 0.001

Group A: PTB patients without treatment

Group B: Healthy individuals

Level of significance $p < 0.05$

ANOVA test was done

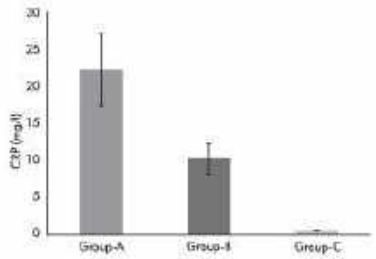

Figure-I: Bar diagram of CRP level in different groups of study subjects.

Group A: PTB patients without treatment, Group B: PTB patients with treatment, Group C: Healthy individuals

Discussion

This cross sectional study was done on pulmonary tuberculosis patients in the Department of Biochemistry, Dhaka Medical College, Dhaka during the period of January 2016 to December 2016. A total of 100 subjects were selected according to the selection criteria. Among them, 50 PTB patients without treatment were included in group A and 50 apparently healthy individuals were included in group B. Serum CRP in mg/l, BMI (kg/m²) and blood pressure (mm-Hg) was measured. According to this study, mean± SD value of BMI in group A and group B were 18.5 ± 2.8 and 23.4 ± 3.5 kg/m² respectively. Mean BMI was significantly lower in PTB patients without treatment than that of normal healthy individuals. This finding was consistent with the cohort study.[5] They included 1557 study subjects where the aim was to find out the association of body mass index with timing of death during tuberculosis treatment. They concluded that for tuberculosis patients, body mass index less than 18.5 kg/m² is an independent predictor for early mortality within the first 8 weeks of treatment.

A case-control study was done to assess the body mass index and nutritional status in pulmonary tuberculosis patients. In this study 60 patients with active pulmonary tuberculosis and 60 controls was selected for study subjects. They concluded that there is a significant degree of nutritional depletion and weight loss in PTB patients than in general population.[6] There are some other studies have been done regarding BMI and PTB patients.[6] For Example, a cross-sectional study was done on 319 PTB patients[7] and another retrospective cohort study which include 1090 TB patients.[8] In both studies BMI was found significantly low in PTB patients. All of these observations establish that there was a significant degree of nutritional depletion and weight loss occurred in PTB patients. BMI is considered to be a useful technique for assessment of nutritional state of PTB. According to this study, mean ± SD of serum CRP level was 22.3 ± 4.8 and 0.6 ± 0.05 mg/l respectively in group A and group B. Mean serum CRP level was significantly higher ($p < 0.001$) in group A than that of group B, similarly comparative study was done to evaluate the correlation of CRP with activity and severity of pulmonary tuberculosis. In this study 44 patients treated for pulmonary tuberculosis (31 patients with elevated CRP> 50 mg/l against 13 patients having a CRP <50 mg/l) was selected for study subjects. They found elevated CRP level in PTB patients and conclude that CRP can be used as a marker of the activity and severity of tuberculosis and can predict the course of the disease.[9] A descriptive study was done to evaluate the C-reactive protein (CRP) in patients with pulmonary tuberculosis. This study includes 127 PTB patients, of which 76 (60%) were males and 51 (40%) were females and CRP was raised in 86 (67.7%) patients of pulmonary TB. They found elevation of CRP in pulmonary tuberculosis and a high CRP is clearly associated with more severe disease.[10]

Conclusion

Assessment of serum C-reactive protein level helps to find out the severity and progress of tuberculosis. In our study, Serum CRP level was significantly higher ($p < 0.001$) in pulmonary tuberculosis patients than healthy individuals.

Acknowledgements

The authors are grateful to the entire staff of Respiratory medical outpatient department of the Dhaka Medical College Hospital for their cooperation and support during the study period.

Conflict of Interest

Authors declare no conflict of Interest.

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 17-22

Original Article

Determination of Necessity of Ureteral Stenting after Uncomplicated Ureteroscopic Lithotripsy for Distal Ureteral Calculi

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Abstract:

Objectives: To determine the necessity of ureteral stenting after uncomplicated ureteroscopic lithotripsy for distal ureteral calculi (≤15mm).

Materials & Methods: This prospective comparative study was conducted in the Department of Urology at Dhaka Medical College, Dhaka from July 2016 to June 2018. Study population included the patients aged 18 to 60 years whoattended in the outpatient Department of Urology, Dhaka Medical College Hospital, Dhaka with distal ureteric stone (≤15mm). After admission patients were studied clinically andwas selected for treatment and study purpose as per selection criteria. A total of 60 patients included with distal ureteric stone underwent uncomplicated ureteroscopic lithotripsy using a pneumatic device without ureteral dilatation.They were randomized equally into non-stented Group-A (n=30) and stented Group-B (n=30). All the cases were evaluated by history taken and relevant investigations were done. Each patient was followed up and evaluated at immediate(day1-3), after 2 weeks (1st visit) and after 90 days (2nd visit) postoperatively. Test statistics were used to analyze the data are Chi-square Test, Student "t" test (unpaired) and Fisher's exact probability test. P<0.05 was considered as significant.

Result: Considering age, gender and stone size there was no significant difference in between two groups. Stone clearance was 100% in both groups. Mean operative time was much higher in group B (stented) patients as compared to that of group A patients. It was statistically significant (P<0.05). Mean hospital stay was 1.42 (±36) days in group A and 2.38 (±54) days in group B (stented). It was statistically significant (p<0.05). Difference between group A and B in immediate postoperative evaluation was significant (p<0.05).That means group A was better than group B. Comparative evaluation after 2 weeks (1st visit) shows some differences (higher in Group-B). Irritative bladder symptoms were staggeringly less frequent in Group-A. In between two groups, medical revisit and urinary tract infection were not different statistically. Evaluation of study groups after 90 days (2nd visit) none of both groups had ureteral stricture or stone fragments residue. Other outcome variables included were also insignificant and commonly less in group A, statistically insignificant (p>0.05).

Conclusion: This present study revealed that non-stented uncomplicated ureteroscopy is a safe and effective procedure and also a better option for the management of distal ureteric stone (≤15mm) using rigid ureteroscope in terms of less complication, less operative time and cost effective.So, ureteral stenting following uncomplicated ureteroscopic lithotripsy for distal ureteral stone (≤15 mm) may be avoided or selectively used instead of routinely used.

Keywords: Ureteral Stenting, Ureteroscopy, Lithotripsy, Distal Ureteral Calculi.

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Received: 06.07.2023 **Accepted:** 04.12.2023

Introduction

Urolithiasis is a major clinical problem and creates an economic burden on our healthcare systems. It is a highly prevalent condition with a high rate of recurrence and a substantial impact on quality of life.[1] The incidence and prevalence of stone disease are increasing, most likely due to changes in nutritional and environmental factors.[2] The surgical management of

ureteric stones has been changed over the past few decades because of advances in instruments and techniques. Extracorporeal shock wave lithotripsy (ESWL) and ureteroscopy are currently the most treatment options in clinical practice.[3]

Treatment of ureteral stone depends on stone size, composition, location and degree of obstruction, pain, presence of infection, single kidney, abnormal ureteral anatomy.[4] For the convenience of selecting a modality of stone management, clinician divided ureter into proximal and distal part. Ureteral stone seated below the sacroiliac joint is referred to the distal and above the sacroiliac joint is proximal ureteric stone.[5] Distal ureteral stone size less than 5 mm usually passes spontaneously.[6] Stones that are more distal (closer to bladder) are more likely to pass than stones that are more proximal (closer to kidney). In the 1980s, proximal ureteral stone had been mostly treated with extra corporeal shock-wave lithotripsy, whereas distal ureteric stones had been treated with ureteroscopic lithotripsy.[7] Extracorporeal shock wave lithotripsy is not an easy procedure for distalureteric stone, because it is not easy to locate with certainty, bony part causes obstruction. Ureteroscopy has a higher stone free rate 90% to 97%.[8] In situ extra corporeal shock wave lithotripsy for treatment of larger (>1cm) ureteral stone has a stone free rate of 76%.[9] Pneumatic lithotripsy is a common procedure done in Bangladesh. Laser lithotripsy is one yet to be a common practice in Bangladesh. Rigid ureteroscope is primarily utilized in the distal ureter, whereas flexible ureteroscope is used in the proximal ureter.[9] It is a common practice in these patients to place a ureteral stent post operatively. Some untoward complications may occur after uretersoscopy including bleeding, infection, flank pain (from injury, oedema and ureteral obstructions) and late ureteric stricture formation. It was previously thought that ureteral stent use would minimize postoperative complications including flank pain secondary to ureteral edema and ureteral stricture development; and possibly aids the passage of small stone fragments. Stenting may promote ureteral healing.[10] However, the ureteral stent itself causes morbidity including bladder irritation, loin pain, haematuria, infection, pyelonephritis, stent migration, encrustation, breakage and even stent fragmentation requiring subsequent endoscopic or open surgical procedure. Stents need to be removed later on at the scheduled visit. These problems plus the additional cost of a stent have brought into question the necessity for stent placement after ureteroscopy for distal ureteral calculi.[11]

It was shown that routine placement of a ureteral stent following uncomplicated ureteroscopy for distal ureteral calculi was not mandatory.[12] Randomised prospective trials have found that routine stenting after uncomplicated ureteroscopy is not necessary because stenting might be associated with higher morbidity.[13] But in Bangladesh, most urologists are commonly practicing D-J stenting evenafter uncomplicated ureteroscopic lithotripsy (URS & ICPL, D-J stenting). Hence, the present study has been designed to compare the success rate and complicationsafter uncomplicated ureteroscopic lithotripsy for the management ofdistal ureteral calculi(<15 mm)with or without stent placement whether ureteral stenting is necessary or not.

Materials and Methods

This prospective comparative study was conducted in the Department of Urology at Dhaka Medical College, Dhaka from July 2016 to June 2018. Study population included the patients aged 18 to 60 years who attended in the outpatient Department of Urology, Dhaka Medical College Hospital, Dhaka with distal ureteric stone (<15mm). After admission patients were studied clinically and was selected for treatment and study purpose as per selection criteria. Out of 65 patients, finally a total of 60 patients (N=60) were randomized equally into non-stented Group-A (n=30) and stented Group-B (n=30). 5 patients were excluded due to dropout (2 cases), mucosal injury (1 case, stenting done) and nonengagement of ureteric orifice (2 cases, stented for passive dilatation requiring second ureteroscopic procedure after 4 weeks).A total of 60 patients with distal ureteric stone underwent uncomplicated ureteroscopic lithotripsy using a pneumatic device without ureteral dilatation. All the cases were evaluated by history taken and relevant investigations were done. Each patient was followed up and evaluated at immediate(day1-3), after 2 weeks (1st visit) and after 90 days (2nd visit) postoperatively.

In this procedure ureteroscopy followed by pneumatic lithotripsy was done to make uniformity.After spinal anesthesia patient with lithotomy position antiseptic wash and draping was done. Cystoscopy was done for identification of ureteric orifice and guide wire was passed within the ureteric orifice under visual and fluoroscopic monitoring.

None of the cases had ureteral orifice or ureteral dilatation. The ureteroscope (8.5fr.) was advanced next to the guide wire. Some times a second guide wire was helpful. As soon as the stone was seen and assessed, the

stone fragmentation was started by pneumatic lithotripter. Meticulous care was taken to avoid injury of ureter and also an eye was kept on stone fragment migration, when any. After completion of ureteroscopic lithotripsy final checkup was done for complete stone clearance and any ureteral injury by direct ureteroscopy under fluoroscopic monitoring. In groupA patients, stenting was not done. In group B patients, D-J stents (6 Fr.) were placed under combined fluoroscopic and cystoscopic guidance. Operative time from cystoscopy to removal of endoscope was recorded for each case. Patients were released within 1-3 days of operation and recorded. Stents were retrieved from group B patients after 2 weeks.

During immediate postoperatively (day1-3), all patients were followed up properly and evaluated for all operative complications including haematuria, flank pain, lower abdominal pain and irritativebladder symptoms (dysuria, urgency).

All the cases were evaluated after 2 weeks (1st visit) of ureteroscopiclithotrypsy. Patients were followed up with history and investigations, urinalysis to detect presence of any urinary tract infection and haematuria, plain X-Ray of KUB region to see stone clearance, stent migration if any. All patients were evaluated for other operative variables including flank pain, lower abdominal pain and irritable bladder symptoms, and medical revisit alsoto see the differences in between two groups.

After 90 days (2ndvisit), urine examination (R/E and C/S) was done to detect presence of any urinary tract infection and haematuria, IVU was done to see ureteral stricture development and stone recurrence. Also other operative variables including flank pain, lower abdominal pain and irritable bladder symptoms (dysuria, urgency) were evaluated to see the differences in between two groups.

Informed consent was taken from each patient.Data was collected in a predesigned data collection sheet. Data was processed and analyzed using SPSS(Statistical Package for Social Sciences) software version-17. Test statistics were used to analyze the data are Chi-square Test, Student "t" test (unpaired) and Fisher's exact probability test. P<0.05 was considered as significant.

Results

Table-I shows the immediate postoperative evaluationof complication (day 1-3) of the study groups werehaematuria, 30% and 56.67%; flank pain, 20% and46.67%;lower abdominal pain, 10% and 36.67% andirritative voiding symptoms,6.67% and 63.33% in group A and group B respectively, which was statistically significant (p <0.05).

Table-I: Immediate postoperative evaluation of complication of the study groups (N=60)

Immediate postoperative evaluation (day 1-3)	Study group		Total	P-value
	Group-A (non-stented) (n=30)	Group-B (stented) (n=30)		
Haematuria	9(30%)	17(56.67%)	26	0.05
Flank pain	6(20%)	14(46.67%)	20	0.02
Lower abdominal pain	3(10%)	11(36.67%)	14	0.01
Irritativevoiding symptoms	2(6.67%)	19(63.33%)	21	<0.001

Chi-square test was used for statistical analysis. n=number of patients, * p<0.05=significant.

Table-II shows the postoperative evaluation of the study groups after 2 weekswerehaematuria, 20% and 43.33%; flank pain, 10% and 30%;lower abdominal pain, 3.33% and 26.7% andirritative voiding symptoms, 3.33% and 46.7% in group A and group B respectively, statistically significant (p<0.05).Stone clearance was same percent in both study groups and one had stent migration in group B.

Table-II: Postoperative evaluation ofstone clearance and complication of the study groups after 2 weeks (n=60)

Postoperative evaluation after 2 weeks	Study group		Total	P-value
	Group-A (non-stented) (n=30)	Group-B (stented) (n=30)		
Haematuria	6(20%)	13(43.33%)	19	0.05
Flank pain	3(10%)	9(30%)	12	0.05
Lower abdominal pain	1(3.33%)	8(26.7%)	09	0.02
Irritative bladder symptoms	1(3.33%)	14(46.7%)	15	<0.001
Stone clearance	30(100%)	30(100%)	60	1
Stent migration	0	1(3.33%)	1	

Chi-square test was used for statistical analysis. n=number of patients, * p<0.05=significant.

Table III shows the postoperative evaluations of the study groups after 90 days were haematuria, 6.7% and 23.33%;flank pain, 3.33% and 13.33%;lower abdominal pain, 3.33% and 10% andirritative voiding symptoms, 3.33% and 20% in group A and group B respectively, statistically insignificant (p>0.05). Stone clearance was same percent in both groups withno ureteral stricture or stone recurrence.

Table-III: Postoperative evaluation ofcomplication of the study groupsafter90 days (n=60)

Postoperative evaluation after 90 days	Study group		Total	P-value
	Group-A (non-stented) (n=30)	Group-B (stented) (n=30)		
Haematuria	2(6.7%)	7(23.33%)	9	0.07
Flank pain	1(3.33%)	4(13.33%)	5	0.35
Lower abdominal pain	1(3.33%)	3(10%)	4	0.61
Irritative voiding symptoms	1(3.33%)	6(20%)	7	0.1
Ureteric stricture	0	0	0	
Stone recurrence	0	0	0	

Chi-square test was used for statistical analysis. n=number of patients,* p<0.05=significant.

Discussion

The present study was designed to observe the treatment success rateand complications of uncomplicated ureteroscopic lithotripsy (URS & ICPL) without stent for the management of distal ureteric stone. In addition a group of cases was also observed and compared with added interest to evaluate the study observation more perfect by using stent after uncomplicated ureteroscopic lithotripsy (URS & ICPL, DJ Stenting) for distalureteric stone up to 15 mm.The findings derived from data analysis leave some scope for discussion to arrive at a conclusion. All the included baseline and operative variables of two groupsconsidering statistical rigors also are discussed chronologically.

At immediate post-operative evaluation, some immediate complications found in this present study. Haematuria, flank pain, lower abdominal pain and irritative bladder symptoms, considerably higher in Group B than these of Group A.In this present study, haematuria was observed in 9(30.0%) cases of Group A compared to 17(56.67%) cases in Group B which was statistically significant (p=0.03). Hence it might be concluded that stent was a cause of heamaturia in more cases.

In a study conducted by Jeong et al.[14] haematuria was observed in 23 (51.1%) cases in stented group and 15 (33.33%) cases in non-stented groupand author commented that it was more severe and prolonged in stented group and found statistically significant (p=0.001).

In the present study flank pain was observed in 6 (20%) patients of Group A and 14 (46.67%) patients of Group B and it was statistically significant (p=0.02).In a study conducted by Cheung et al.[15], a total of 58 patients with ureteral stones were randomized into stented or no stented group. Flank pain was 66% in stented group and 21% in non-stented group,which was similar to present study.

Another study among 58 patients randomized into non-stented (29) and stented (29) ureteroscopic lithotripsy, done by Denstedt et al.[10] showed that nonstented group had an improved early post-operative score with respect to flank pain compared to the stented group (mean score 1.7 versus 4.1; p = 0.001).

Lower abdominal pain in this study was in 3 (10%) patientsof Group-A (non-stented) and in 11 (36.67%) patients of Group-B (stented) which was statistically significant (p=0.001). In a study patients with stents had more postoperative lower abdominal pain, statistically significant (p<0.001) compared to the no stented group.[11] This study was conducted among 113 patients with distal ureteral calculi amenable to ureteroscopic lithotripsy.

Irritative bladder symptoms were present in this present study in 2(6.67%) patients of Group A (non-stented) and 19(63.33%) patients of Group B (stented), which was statistically significant (p<0.001).

Borborogluet al.[11] showed that patients with stents had statistically significantly more irritative bladder symptoms (p=0.002) compared to those without stents. This study was conducted among 113 patients with distal ureteral calculi amenable to ureteroscopic lithotripsy.Another study showed irritative bladder symptoms were significantly more in stented group than non-stented group, mean score was 5.1 versus 1; p=0.001.[10]

Inpresent study, it was observed and compared the outcomesand complications after 2 weeks of operation in between two groups. Irritative bladder symptoms were staggeringly less in the non-stented group than that of the stented group 1 versus 14 (p<0.001). Among rest of the Complications like haematuria, flank pain and lower abdominal pain werealso different, statistically significant (p<0.05)in between two groups, commonly less in group A. Stone clearance was 100% in both groups.4 patient (13.33%) in group A and 4 patients (13.33%) in group B developed urinary tract infection and were treated according to urine culture sensitivity.

1(3.33%) patient in non-stented group developed ureteral obstruction (radionuclide scan) in the post-operative period that necessitated stenting, and 1 patient in the stented group experienced stent migration necessitating removal. 6(20%) cases of group A(n=30) and 5(16.7%) cases of group B(n=30) needed medical revisit for pain, fever and or vomiting. With X-Ray KUB region done, none of both groups had stones.

Aghaways et al.[16] found at day 14 post-operative visit of their study similar to present study, flank pain for stenting group was significant (p=0.038). Dysuria (p=0.02), urgency (p=0.011) and haematuria (0.001) were higher in the stented group.

Stent migration is also a complication associated with indwelling ureteric stents. Faqihet al.[17] reported an incidence of stent migration of 3.7% cases. Richteret al.[18] in a study demonstrated that 8% of the stent migrated. Ringelet al.[19] showed in a study that stent migration was 8.2%. Although silicone stents have a lower risk of calcification, their smooth regular surface renders them susceptible to migration.

At 2nd follow-up visit after 90 days, evaluation of the subjects after 90 days of operation revealed that none of them in either group had stone or ureteral stricture (IVU) and significant complaints. Urinalysis showed 1(3.33%) patient of stented group had urinary tract infection and was treated accordingly. All the outcomes evaluated thus demonstrated that the non-stented group was still better than the stented group. This inference was also complianttо those done by Denstedtset al.[10] & Chen et al.[20]

Results of the study by Cheunget al.[15] showed that there was no significant difference in stricture formation rate with omission of a ureteral stent. In a study of 48 patients undergoing ureteroscopy for distal ureteric stone, Srivastava et al.[21] had done radiologic follow-up at the end of 90 days. None of the patients had evidence of ureteral stricture formation.

A prospective nonrandomized study by Raneet al.[22] followed 27 patients without stents after distal ureteroscopy for stones. Postoperative imaging was performed in 94% of their patients with no evidence of ureteral stricture. A second study was done by Wollinet al.[23] where 28 patients were randomized into stented and unstented groups after ureteroscopy for distal ureteral stones. They found that patients without stents had less bladder irritativesymptoms compared to those with stents. Although neither of these studies included patients undergoing intra-operative ureteral dilation, both demonstrated that leaving patients without stents after distal ureteroscopywas safe and often well tolerated.

Conclusion

This present study revealed that non-stented uncomplicated ureteroscopy is a safe and effective procedure and also a better option for the management of distal ureteric stone (≤15mm) using rigid ureteroscope.So, ureteral stenting following uncomplicated ureteroscopic lithotripsy for distal ureteral stone (≤15 mm) may be avoided or selectively used instead of routinely used.

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 23-28

Original Article

Prognostic correlation between electrocardiographic QRS duration and echocardiographic left vertricular systolic function in patients with NSTEMI.

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Abstract:

Background: Early risk stratification of patients with myocardial infarction is critical to determine optimum treatment strategies and enhance outcomes. The present study was therefore undertaken to determine the relationship between QRS duration (QRSd) on admission ECG and left ventricular ejection fraction (LVEF) as a measure of left ventricular function in non-ST elevated myocardial infarction (NSTEMI) patients.

Methods: This observational study was carried out from January to December 2020 with total of 120 patients with a history of NSTEMI. Based on the cut-off value of QRS duration 100 msec, the patients were divided into two groups-one group with QRS duration ≤ 100 msec (normal QRS) and another group with QRS duration> 100 msec (prolonged QRS). Left ventricular systolic function was considered preserved, if it was 252% and reduced if it was < 52%. The association and correlation between QRS duration and LVEF was then observed.

Results: The prevalence of reduced LVEF in patients with prolonged QRS duration (> 100 msec) was double (38%) than that of preserved (19.5%). The risk of having LV dysfunction in patients with prolonged QRS duration was 2.5 (95% CI=1.1-6.2) times higher than that in patients normal QRS duration (d" 100 msec) (p=0.039). The QRS duration and LVEF bear a significantly inverse relationship (r=-0.341, p<0.001). The sensitivity of prolonged QRS duration (> 100 msec) in correctly detecting LV dysfunction was inappreciably low (38%), although its specificity in excluding those who did not have LV dysfunction was optimum (80.5%) with overall diagnostic accuracy being 52.5%

Conclusion: Prolonged QRS duration on a standard 12-lead ECG is associated with reduced echocardiographic LVEF. However, QRS duration in predicting LV dysfunction is much less sensitive, although its specificity is optimum indicating that QRS duration is not a good predictor of LV dysfunction (reduced LVEF), but it can dependably predict those who do not have LV dysfunction (preserved LVEF).

Key Words: Coronary artery disease, QRS Duration, non-ST elevated myocardial infarction, Left Ventricular Systolic Function.

Introduction

Cardiovascular diseases (CVDs) are known to be the leading causes of death worldwide. In 2015, nearly 20 million CVD deaths occurred (equivalent to one-third of total global deaths) and 423 million people had prevalent CVD (1 in 17 of the global population).[1]

In Bangladesh death due chronic diseases, especially the 'fatal four' i.e. Cardiovascular disease (CVD), cancer, chronic respiratory disease and diabetes is increasing at galloping pace.[2] Acute coronary syndromes appeared as the leading cause (3.7%) of death across 504 public hospitals in Bangladesh in 2012 as reported by the "Health Bulletin 2013".[3] Of them Non-ST segment elevation myocardial infarction (NSTEMI) is the

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Received: 05.11.2023 **Accepted:** 11.12.2023

commonest form of acute coronary syndrome (ACS) and is a leading global cause of premature morbidity and mortality. The electrocardiogram, due to its wide availability, low cost and simplicity, has emerged as an essential tool for diagnostic and prognostic stratification of NSTEMI, ST segment depression or transient ST segment elevation and T wave changes occur in up to 50% of patients with NSTEMI. New ST-segment deviation (20.1 mV) is a useful measure of ischemia and prognosis. Transient (i.e., <20 minutes) ST elevation, which occurs in approximately 10% of patients with UA/NSTEMI, portends a high risk of future cardiac events. T wave changes are sensitive but not specific for acute ischemia unless they are marked (>0.3 mV).[4-7]

Widening of the QRS complex is related to slower spread of ventricular depolarization, either due to disease of the His-Purkinje network and/or reliance on slower, muscle-to- muscle spread of depolarization. Shape of an abnormal QRS complex varies from almost normal to wide and bizarre and/or slurred and notched. Causes of a widened QRS complex include right or left BBB, pacemaker, hyperkalemia, ventricular pre-excitation as is seen in Wolf-Parkinson-White pattern, and a ventricular rhythm The QRS duration determined by electrocardiography (ECG) is related to ventricular dysfunction.. Prolonged QRS duration can lead to ventricular dysfunction in long-term and also it can be a direct result of ventricular dysfunction. Additionally, it was found that prolonged QRS duration was related to poor prognosis in anterior AMI. In previous studies, it was shown that prolonged QRS on admission was related to cardiac adverse events.[8-9] Many studies documented the prognostic value of ECG with LV systolic function by echocardiography, where prolonged QRS duration of acute STEMI patients demonstrated significant association with left ventricular systolic dysfunction.[10] Another study showed that patients with prolongation of QRS duration had increased ventricular volume, decreased left ventricular ejection fraction (EF), and higher incidence of sudden cardiac death.[11-12]

But there are limited studies to show the correlation between QRS duration on ECG and LV systolic function by echocardiography in patients with NSTEMI in Bangladesh. The present study was, therefore designed to see the relationship between QRS duration on surface ECG and left ventricular systolic function in patients with Non-ST elevated Myocardial Infarction.

Methods

This study was designed as an observational study at Department of Cardiology, Sir Salimullah Medical College & Mitford Hospital, Dhaka. This study was conducted from January 2020 to December 2020. A total number of 120 patients who fulfilled inclusion and exclusion criteria were selected for the study as the sample population. The samples were collected by purposive sampling method. Patients with Previous history of myocardial infarction, known non-ischemic causes which can cause prolonged QRS duration (WPW syndrome, drugs, electrolyte imbalance), LBBB or RBBB, Pacemaker rhythm, known valvular heart disease, congenital heart disease and cardiomyopathy, major non-coronary disorders which cause elevation of troponin-I such as CKD, myocarditis, acute pulmonary embolism were excluded from this study.

Informed written consent was taken from each patient before enrollment. Meticulous history was taken and detailed clinical examination was performed. Risk factors profile including smoking, hypertension, dyslipidemia and family history of myocardial infarction were noted. Necessary physical examinations were done including pulse, blood pressure, jugular venous pressure, basal crepitation, auscultation for any cardiac murmur. Some primary investigations were done including serum troponin value, random blood sugar, serum creatinine, serum electrolytes, lipid profile on the day of admission. Resting ECG of all patients was done at a paper speed of 25 mm/s and 10 mm standardization at admission using Fukuda ECG machine (Model: FX-2111) Denali Co Ltd Japan. QRS duration was manually measured and calculated from the beginning of the first. appearing Q or R wave to the end of the S wave. All measurements were taken from the precordial leads (V1 to V6). Average of measurements from all precordial leads was considered. Based on the cut-off value of QRS duration 100, the patients were divided into two groups-one group with QRS duration 100 msec (normal QRS, 82 patients) and another group with QRS duration > 100 msec (prolonged QRS, 38 patients). Trans thoracic echocardiography was done preferably within 24 hours of admission, left ventricular systolic function was measured in terms of left ventricular ejection fraction (LVEF). LVEF was measured with the help of modified Simpson's method. Accordingly, LV systolic function was considered normal, if left ventricular ejection fraction was 52%. ECHO done by GE Vivid E95 Machine. Collected data were processed and analyzed using SPSS (Statistical Package for Social Science), version 23.0

Results:

This observational analytical study aimed at finding the relationship between QRS duration and left ventricular systolic function in patients with NSTEMI. The exposure or the independent variable (QRS duration on admission ECG) was divided into ≤100 msec and > 100 msec, while the outcome or dependent variable, LVEF was divided into <52% (reduced, n=79) and ≥52% (normal, n=41). The association & correlation between QRS duration and LVEF was then observed. The findings obtained from data analyses are presented below:

Nearly half (49.2%) of the patients had family history of CAD, 44.2% were hypertensive, 30.8% diabetic, 38.3% smoker and 10% were dyslipidemia (Fig. I).

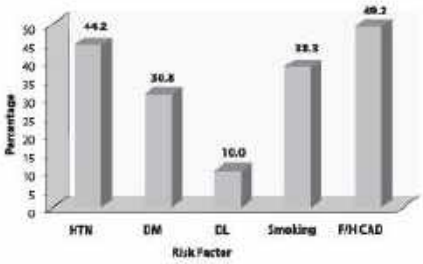

Fig.-I: Distribution of risk factors among the sampled population.

The mean age of the NSTEMI patients with prolonged QRSd was significantly lower than that of the patients with normal QRSd (p = 0.008). However, sex distribution was almost identical between the groups (p=0.497). BMI was no different between the groups (p=0.224). None of the conventional risk factors of coronary artery diseases were significantly different between the groups (p>0.05) (table I).

Table-I: Distribution of baseline characteristics between prolonged and normal QRS duration.

Baseline characteristics	QRSd (ms)		P-value
	Prolonged (n=38)	Normal (n=82)	
Sex			
Male	30(78.9%)	60(73.2%)	0.497
Female	8(21.1%)	22(26.8%)	
Age(yrs)	53.7 ± 9.2	58.9 ± 10.7	0.008
BMI(kg/m²)	27.9 ± 4.1	27.1 ± 3.3	0.224
Hypertension	15(39.5%)	33(46.3%)	0.481
Diabetes Mellitus	11(28.9%)	26(31.7%)	0.761
Dyslipidaemaia	5(13.2%)	7(8.5%)	0.647
Smoking habit	18(47.4%)	28(34.1%)	0.166
Family history CAD	21(55.3%)	38(46.3%)	0.363

Figures in the parentheses indicate corresponding %; Chi-squared Test was done to analyze the qualitative data. Quantitative data were analyzed using unpaired t-Test and were presented as mean ± SD.

None of the co-morbidities or factors (hypertension, diabetes mellitus, dyslipidemia, smoking habit and family history CAD) shown in table II was significantly associated with LV dysfunction (reduced LVEF). However, smoking habit was considerably higher in patients with reduced LVEF (p = 0.062).

Table-II: Association between co-morbidities or risk factors and LVEF

Risk factor	LVEF (%)		P-value
	<52 (n=79)	≥52 (n=41)	
Hypertension	33(41.8)	20(48.8)	0.463
Diabetes	22(27.8)	15(36.6)	0.326
Dyslipidaemaia	6(7.6)	6(14.6)	0.369
Smoking habit	35(44.3)	11(26.8)	0.062
Family history CAD	41(51.9)	18(43.9)	0.406

Figures in the parentheses indicate corresponding %; *Chi-squared Test was done to analyze the data.

The prevalence of reduced LVEF (< 52%) with prolonged QRS duration was double (38%) than that of preserved LVEF (252 %) (19.5%). The risk of having LV dysfunction in patients with prolonged QRS duration was 2.5 (95% CI = 1.1- 6.2) times higher than that in patients normal QRS duration (≤100 msec) (p=0.039)

Table-III: Association between prolonged QRS duration

QRS duration (ms)	LVEF (%)		Odds Ratio (95% CI of OR)	*P-value
	<52 (n=79)	≥52 (n=41)		
>100	30(38.0%)	8(19.5%)	2.5(1.1-6.2)	0.039
≤100	49(62.0%)	33(80.5%)		

Figures in the parentheses indicate corresponding %; *Chi-squared Test was done to analyzed the data.

Correlation between QRS duration and LVEF depicts that as QRS duration increases LVEF decreases. The two variables bear a significantly inverse relationship (r=-0.341, p<0.001) (Fig.2).

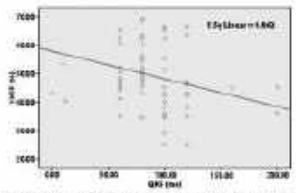

Fig-II: Correlation between QRS duration and LVEF.

Table-IV shows the accuracy of QRS duration as a non-invasive test in differentiating NSTEMI patients with LV dysfunction from normal LV function. The sensitivity of prolonged QRS duration (100 msec) in correctly detecting LV dysfunction from the normal ones was 30/79×100 =38%, while the specificity of the test in correctly excluding those who did not have LV dysfunction was 33/41x100= 80.5%. The positive and negative predictive values of the test were 30/38 x 100 = 78.9% and 33/82×100 = 40.2% respectively. The percentages of false positive and false negative as yielded by the test were 8/38x100= 21.1% and 49/82×100 = 59.8% respectively. The overall diagnostic accuracy of the test was (30 + 33)/ 100x100 = 52.5%.

Table-IV: Accuracy of QRS duration in detecting LV dysfunction.

QRS duration (ms)	LV Dysfunction		Total
	Yes (LVEF<52%)	NO (LVEF ≥52%)	
>100	30)	8	38
≥100	49	33	82
Total	**79**	**41**	**120**

Sensitivity 38%, Specificity = 80.5%, Positive predictive value of the test (PPV) 78.9%, = Negative predictive value of the test (NPV) =40.2%, Percentage of false positive = 21.1%, Percentage of false negative = 59.8%

Discussion:

Despite decreasing mortality trends of coronary artery disease (CAD) in many developed countries, increasing number is noticed in developing countries.[12] The ECG, due to its wide availability, low cost and simplicity, is an essential tool for the diagnosis and prognostic stratification of STEMI,[13] Whether, the same tool can be used in the prediction of left ventricular systolic dysfunction in patients with NSTEMI has been tested in the present study.

In this study prolonged QRS duration (> 100 msec) on a standard 12-lead ECG was associated with reduced LVEF, as determined by echo- cardiography. The high specificity of the 12-lead ECG for the prediction of abnormal LV systolic function suggests that in patients with QRS duration> 100 msec, the resting LVEF is more likely to be abnormal. The resting 12-lead ECG is readily available for all patients with suspected or proven cardiac disease. Although valuable. information to diagnose the rhythm and presence or absence of acute or remote myocardial infarction and left ventricular hypertrophy is evident in the resting ECG, the utility of the QRS duration as a predictor of LV systolic function has long been ignored. Previous studies indicated that a normal 12-lead resting ECG is associated with normal LV function in 92-95% of cases[14-17]

QRS scores incorporating several ECG variables have been devised by several investigators. Palmeri et al. used a 29-point system based on the duration of Q and R waves and on the ratios of R-to-Q amplitude and R-to-S amplitude. Palmeri showed certain QRS scores to be proportional to the severity of wall-motion abnormalities (determined by radionuclide gated blood pool scanning) and to have inverse correlations with measured LVEF[18] Roubin et al. using the same scoring system showed that a QRS score of 27 had a specificity of 97% and a sensitivity of 59% for predicting a reduced LVEF of 45%[19] However, the utility of such scoring systems has been questioned by other investigators. Fiorettiet al. showed that QRS score of Wagner et al. was of little use in estimating LVEF. [20-21]

Askenazi et al. demonstrated that the sum of the R-waves in leads aVL, aVF, and v1 to v6 correlated with the LVEF, and an R-wave sum of 4 mV was the best predictor of a decreased EF. Young et al. found that the correlation between the modified QRS score of Wagner et al. and LVEF to be only fair, and the sum of R-wave voltage criterion of Askenazi et al. to correlate poorly with LVEF[22-23] Although depressed LVEF is associated with a prolonged QRSd. It is also possible that prolonged QRS duration (even in the normal ranges) could directly contribute to worsen the prognosis by causing ventricular asynchrony, functional mitral regurgitation and left ventricular dysfunction[24]

In the present study, the correlation between QRS duration and resting LVEF was tested outright and QRS duration was found to be negatively correlated with resting LVEF, that is, left ventricular systolic function. However, as accuracy of prolonged QRS duration (> 100 msec) in predicting LV dysfunction was tested, its sensitivity was found to be inappreciably low (38%), although its specificity was optimum. indicating that QRS duration is not a good predictor of LV dysfunction (reduced LVEF) but it can dependably predict those who do not have LV dysfunction (preserved LVEF). Murkofsky et al. also found a prolonged QRS (>100 msec) to be highly specific, but relatively insensitive, for predicting LV dysfunction[25] Thus, although a QRS duration> 100 msec was highly associated with an abnormal resting LVEF, a normal QRS duration of d" 100

msec did not reliably rule out reduced LVEF. Furthermore, correlation between QRS duration and LVEF suggests that more the prolonged QRS duration the greater the worsening of LVEF (the severe the LV dysfunction). However, every scientific study might be associated with some inherent biases and limitations. Likewise, there were several limitations of the present study, which deserve mention.

Limitations

The main limitation of our study is the manually measurement of QRS duration. This might have reduced the accuracy. The present study did not use other described ECG scoring systems that had been proven useful in the determination of infarct size and estimation of LV function shortly after a myocardial infarction.

Conclusion

Prolonged QRS duration on a standard 12-lead ECG is associated with reduced echocardiographic LVEF. The QRS duration bears negative correlation with resting LVEF suggesting that as QRS duration increase LVEF decreases. However, QRS duration in predicting LV dysfunction is much less sensitive, although its specificity is optimum indicating that QRS duration is not a good predictor of LV dysfunction, but it can dependably predict those who do not have LV dysfunction.

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 29-34

Original Article

Assessment of Insulin Resistance in Polycystic Ovary Syndrome Patients

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Abstract:

Background: Polycystic Ovarian Syndrome (PCOS) is a common Gynecological condition marked by anovulation and hyperandrogenism, affecting 7-8% of reproductive-age women. It's a leading cause of treatable infertility. Many PCOS patients also show metabolic syndrome signs like insulin resistance, obesity, and dyslipidemia.

Objective: To assess the insulin resistance in polycystic ovary syndrome patients.

Methods: This was a case-control study that was conducted in the Department of Obstetrics & Gynecology, Dhaka Medical College Hospital, Dhaka, Bangladesh from January 2015 to December 2016. This study included 51 women aged 20-35 with polycystic ovary syndrome (PCOS). Data analysis was performed with MS Office tools and SPSS Version 23.0.

Results: Among the total participants, the mean s. testosterone was 1.8±0.9 ng/ml and D2 s. LH was 12.7±6.7 mIU/mL; the difference was statistically significant ($p<0.05$). PCOS patients with HOMA-IR >3.2 had higher testosterone, LH, and insulin levels compared to those with HOMA-IR <3.2. FSH levels did not differ significantly ($p>0.05$). Insulin resistance analysis revealed mean fasting insulin of 27.3 ± 10.7 µU/ml, fasting blood sugar of 5.1 ± 0.8 mmol/L, and HOMA-IR at 4.1 ± 1.3. These values were statistically significant ($p<0.05$). Conclusion: The probability of developing insulin resistance is significantly greater in women with Polycystic Ovary Syndrome (PCOS) compared to women without PCOS. PCOS patients with insulin resistance are at increased risk of long-term complications like type 2 diabetes mellitus, hypertension, dyslipidemia, CAD, and gestational diabetes mellitus.

Keywords: Insulin Resistance, Polycystic Ovary Syndrome, HOMA-IR.

Introduction

Polycystic ovary syndrome (PCOS) is recognized as one of the most common endocrine disorders affecting females. Its etiology is influenced by a combination of genetic and environmental factors, resulting in a complex interplay. PCOS patients can exhibit a range of symptoms, but the primary clinical features typically include irregular menstruation and/or oligo/anovulation, hyperandrogenism, and the presence of polycystic ovaries. The prevalence of PCOS varies across different populations, influenced by geographic location and ethnicity. Additionally, the utilization of various diagnostic criteria contributes to observed differences in prevalence among different demographic groups. The widely adopted Rotterdam criteria diagnose PCOS in approximately 8-13% of females.[1] In Western countries, polycystic ovarian syndrome (PCOS) exhibits a prevalence ranging from 4% to 12%, making it the most common endocrine disorder affecting women of reproductive age.[2] European countries report a prevalence of 6.5% to 8%.[3] Clinical manifestations of PCOS encompass menstrual irregularities, hirsutism, and frequently, issues related to infertility or subfertility. Menstrual irregularities commonly observed in PCOS patients include prolonged erratic menstrual bleeding, amenorrhea, and oligomenorrhea.[4] On the other hand, some females with PCOS may have normal menstrual cycles, either with or without anovulation.[5] Notably, the majority of females with oligomenorrhea and about half of those with amenorrhea will be diagnosed with PCOS upon presentation.[6] Additionally, most females displaying

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Received: 16.11.2023 **Accepted**: 04.01.2024

clinical features of androgen excess will ultimately receive a PCOS diagnosis.[7] Ramanand et al. conducted a study[8] in which 44.16% of women were clinically diagnosed with hirsutism. Interestingly, while a higher percentage of obese women presented with hirsutism, there was no significant correlation between hirsutism and obesity. Acne was observed in 20% of the patients, while baldness was less common at 6.66%. A significant 44.16% of patients exhibited acanthosis nigricans (AN), which serves as a surrogate marker for insulin resistance.[8] PCOS is associated with a range of other medical conditions. Often, fat accumulation leading to overweight and obesity precedes the clinical manifestations of PCOS. Research has shown that adopting a healthy lifestyle involving dietary modifications and exercise therapy can lead to weight reduction, improved insulin resistance, reduced abdominal fat, decreased testosterone levels, and improved features of hyperandrogenism in females with PCOS.[9] PCOS patients with insulin resistance have an increased risk of developing metabolic syndrome, reproductive dysfunction, and epilepsy.[10]

Materials & Methods

This case-control study was conducted in the Department of Obstetrics & Gynecology at Dhaka Medical College Hospital, Dhaka, Bangladesh, spanning from January 2015 to December 2016. The study participants included 51 women aged between 20-35 years with polycystic ovary syndrome (PCOS) in the case group. Other 51 women without PCOS were recruited in the control group for comparison. Sample selection was carried out using a purposive sampling technique. Ethical approval for the study was obtained from the hospital's ethical committee and informed written consent was collected from all participants before data collection. The inclusion criteria for this study encompassed patients with oligomenorrhea (menstrual cycle interval > 35 days), amenorrhea (absence of menstruation for six months or more), clinical and/or biochemical signs of hyperandrogenism, and the presence of polycystic ovaries as confirmed by ultrasound examination. Patients exhibiting at least two out of these three features were considered to have PCOS. Furthermore, the PCOS patients were categorized into subgroups based on their BMI, with divisions into two groups: 18.5-24.9 kg/m^2 and ≥25 kg/m^2. Conversely, the exclusion criteria for this study included patients with a known history of diabetes mellitus, hyperprolactinemia, hypothyroidism, hyperthyroidism, and patients with cardiac or renal dysfunction. The demographic and clinical information of all participants was recorded, and data analysis was conducted using MS Office and the SPSS version 23.0 program, as needed.

Results

In this study, as the age distribution of the study patients, it was observed that the mean age was found 25.0±32 years in the case group and 26.5±4.7 years in the control group (Table I). The difference was statistically not significant between the two groups. Regarding the distribution of BMI levels of the study patients, it was observed that the mean BMI was found 27.0±3.1 kg/m2 in the case group and 26.1±2.1 kg/m2 in the control group (Figure I). The difference was statistically not significant ($p>0.05$) between the two groups. Among participants with normal insulin resistance (Insulin resistance <0.2), the mean waist circumference was 82.4 cm (±6.7), the mean hip circumference was 99.4 cm (±4.6), and the mean W/H ratio was 0.80 (±0.38). In contrast, in participants with high insulin resistance (Insulin resistance >3.2), these measurements were notably higher. Specifically, the mean waist circumference was 86.6 cm (±3.9), the mean hip circumference was 101.4 cm (±5.6), and the mean W/H ratio was 0.83 ±0.18 (Table II). In PCOS patients, those with HOMA-IR >3.2 exhibited more severe symptoms of hirsutism, acanthosis nigricans, and oligomenorrhea compared to patients with HOMA-IR levels <3.2 (Table III). Among the control patients with insulin resistance, 3 out of 4 (75.0%) had acanthosis nigricans and hirsutism, while 2 out of 4 (50.0%) had acne. The mean serum testosterone was found 1.8±0.9 ng/ml in the case group and 0.9±0.2 ng/ml in the control group. The mean D2 serum FSH was found 5.7±2.0 IU/L in the case group and 5.1±1.3 IU/L in the control group. The mean D2 serum LH was found 12.7±6.7 mIU/mL in the case group and 5.9±1.4 mIU/mL in the control group (Table IV). Individuals with insulin resistance (HOMA-IR >3.2) had significantly higher serum testosterone levels (2.8 ± 0.8 ng/ml) compared to those with HOMA-IR <3.2 (2.2 ± 1.0 ng/ml) with a p-value of 0.021. D2 serum FSH levels showed no significant difference between the two groups ($p = 0.483$). However, D2 serum LH levels were notably higher in insulin-resistant patients (14.5 ± 5.0 mIU/mL) compared to those without (11.2 ± 3.3 mIU/mL), with a statistically significant difference ($p = 0.006$). Fasting insulin levels were also significantly elevated in

individuals with insulin resistance (32.8 ± 8.3 µU/ml) compared to those without (26.8 ± 12.1 µU/ml) with a p-value of 0.041 (Table V). The mean serum testosterone level and D2 serum LH level were statistically significant ($p<0.05$) between the two groups. The mean fasting insulin was found 27.3±10.7 µ U/ml in the case group and 14.3±6.0 µU/ml in the control group. Serum fasting blood sugar was found 5.1±0.8 (mmol/L) in the case group and 4.6±0.6 (mmol/L) in the control group. The mean HOMA IR was found 4.1±1.3 in the case group and 2.4±1.2 in the control group (Table VI). The mean fasting insulin, fasting blood sugar, and HOMA IR were statistically significant ($p<0.05$) between the two groups. In this study, when analyzing the serum LH/FSH ratio in the study participants, it was observed that the serum LH/FSH ratio was increased in 30 (58.8%) of the cases in the case group, while it was only seen in 4 (7.8%) of the control group (Table VII). The difference in LH/FSH ratio between the two groups was statistically significant ($p<0.05$). In the case group, the mean fasting insulin was notably higher at 27.3±10.7 µU/ml, compared to the control group with a mean of 14.3±6.0 µU/ml. Likewise, fasting blood sugar levels were significantly elevated in the case group, with a mean of 5.1±0.8 mmol/L, whereas the control group exhibited a lower mean fasting blood sugar of 4.6±0.6 mmol/L. Furthermore, when assessing insulin resistance using the Homeostatic Model Assessment of Insulin Resistance (HOMA IR), the case group displayed a considerably higher mean value of 4.1±1.3 compared to the control group, which had a mean HOMA IR of 2.4±1.2. These differences in mean fasting insulin, fasting blood sugar, and HOMA IR were all statistically significant ($p<0.05$) between the two groups. In the current study, when analyzing the fasting lipid profile of the study patients, it was observed that 54.90% had HDL levels less than 40, while 54.10% had HDL levels greater than 40. In terms of total cholesterol and triglycerides, 83.40% had levels below 200, and 17.60% had levels above 200. Moreover, the Scatter diagram showed a positive correlation ($r= -0.357$; $p=0.009$) between HOMA-IR level and serum testosterone (Figure II). On the other hand, another Scatter diagram showed a positive correlation ($r= -0.275$; $p=0.048$) between HOMA-IR level and serum LH (Figure III).

Table-I: Age distribution of study participants. (N=10)

Age (Years)	Case (n=51)		Control (n=51)	
	n	%	n	%
20-25	29	56.9%	24	47.1%
26-30	18	35.3%	17	33.3%
31-35	4	7.8%	8	15.7%
36-40	0	0.0%	2	3.9%

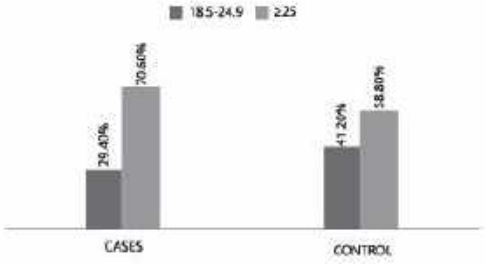

Figure-I: BMI status of the study participants

Table-II: Comparing waist circumference, hip circumference, and W/H ratio to insulin resistance in participants. (n=51)

Age (Years)	Insulin resistance	
	<.2(normal) (n=23)	>3.2(high) (n=28)
	Mean +SD	Mean +SD
WC (cm)	82.4+6.7	86.6+3.9
Hip circumference	99.4+4.6	101.4+5.6
W/H Ratio	0.80+0.38	0.83+0.18

Table-III: Comparison between clinical parameters of PCOS patients with IR and non-IR. (n=51)

Clinical parameters	HOMA-IR level				P-value
	<3.2 (n=23)		>3.2 (n=28)		
	n	%	n	%	
Case group					
Hirsutism	11	47.8	22	78.6	0.022
Acne	4	17.4	6	21.4	0.051
Acanthosis nigricans	10	43.5	20	71.4	0.043
Oligomenorrhoea	14	60.9	24	85.7	0.042
Amenorrhea	5	21.7	8	28.6	0.577
Hypertension	4	17.4	6	21.4	0.5
Control Group					
Hirsutism			3	75	0.076
Acne			2	50	0.538
Acanthosis Nigricans			3	75	0.033

Table-IV: Laboratory findings in study participants. (N=102)

Parameter	Cass (n=51)		Control (n=51)		P-value
	n	%	n	%	
Serum testosterone (ng/ml)					
0.5-1.2 (normal)	29	56.90%	47	92.20%	
>1.2	22	43.10%	4	7.80%	
Mean ±SD	1.8±0.9		0.9±0.2		0.001[S]
D2 Serum FSH (IU/L)					
2.8-8.6 (normal)	43	84.30%	46	90.20%	
>8.6	8	15.7	5	9.80%	
Mean ±SD	5.7±2.0		5.1±1.3		0.075[NS]
Serum LH (mIU/mL)					
2.8-13.7	22	43.10%	46	90.20%	
> 13.7	29	56.90%	5	9.80%	
Means ±SD	12.7±6.7		5.9±1.4		0.001[S]

Table-V: Hormone profile variation in patients with insulin resistance. (n=51)

Variables	<3.2 (n=23)	>3.2 (n=28)	P-value
	Mean ±SD	Mean ±SD	
Serum testosterone (ng/ml)	2.2±1.0	2.3±0.8	0.021
D2 serum FSH (IU/L)	4.8±1.9	5.2±2.1	0.483
D2 serum LH (mIU/mL)	11.2±3.3	14.5±5.0	0.006
Fasting insulin (µU/ml)	26.8±12.1	32.8±8.3	0.041

Table-VI: Distribution of the study participants by insulin resistance. (N=102)

Variables	Cass (n=51)		Control (n=51)		P-value
	n	%	n	%	
Fasting insulin ((µU/ml)	21	41.20%	47	92.20%	
>25	30	58.80%	4	7.80%	
Mean ±SD	27.3+10.7		14.3+6.0		0.001[S]
Serum fasting blood sugar (mmol/L)					
3.6-6.1 (Normal)	29	56.90%	46	90.20%	
6.1-6.9	22	43.20%	5	9.80%	
Mean ±SD	5.1+0.8		4.6+0.6		0.005[S]
HOMA IR					
<3.2	23	45.10%	47	92.20%	
>3.2	28	54.90%	4	7.80%	
Mean ±SD	4.1+1.3		2.4+1.2		0.001[S]

Table-VII: Serum LH/FSH ratio in study participants. (N=102)

LH/FSH ratio	Cass (n=51)		Control (n=51)		P-value
	n	%	n	%	
<2	21	41.2	47	92.2	0.001
>2	30	58.8	4	7.8	

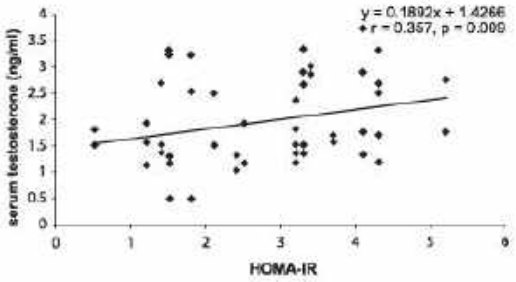

Figure-II: Scatter diagram showed positive correlation (r= -0.357; p=0.009) between HOMA-IR level and serum testosterone

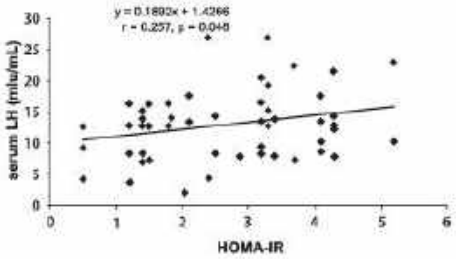

Figure-III: Scatter diagram showing positive correlation (r= -0.275; p=0.048) between HOMA-IR level and serum LH

Discussion

This study aimed to assess the insulin resistance in patients with polycystic ovary syndrome. In this study, regarding the age distribution of the study participants, the mean age was determined to be 25.0±32 years in the case group and 26.5±4.7 years in the control group. The observed difference between the two groups was statistically nonsignificant. These findings are consistent with the results of Amisi et al.[11] who reported similar age distributions in PCOS cases and the control group. The majority of study participants in this research belonged to the 20-30 year's age group, highlighting the higher prevalence of PCOS in younger women. Additionally, concerning the distribution of BMI levels among the study participants, the mean BMI was determined to be 27.0±3.1 kg/m^2 in the case group and 26.1±2.1 kg/m^2 in the control group. The observed difference between the two groups was statistically nonsignificant (p>0.05). These results align with the findings of Yildir et al.[12] who reported comparable BMI values in the case and control groups. In terms of waist, hip circumference, and the W/H ratio related to insulin

resistance, 23 cases had measurements within the normal range, including a mean waist circumference of 82.4 ± 6.7 cm, hip circumference of 99.4 ± 4.6 cm, and a W/H ratio of 0.80 ± 0.38. However, 28 cases showed higher values, with a mean waist circumference of 86.6 ± 3.9 cm, hip circumference of 101.4 ± 5.6 cm, and a W/H ratio of 0.83 ± 0.18, indicating insulin resistance. A study by Cakir et al.[13] found a mean W/H ratio of 0.84 ± 0.5 in the case group and 0.81 ± 0.06 in the control group, consistent with these findings. Among the total women in the study, the mean serum testosterone was 1.8±0.9 ng/ml in the case group and 0.9±0.2 ng/ml in the control group. The mean D2 serum FSH was 5.7±2.0 IU/L in the case group and 5.1±1.3 IU/L in the control group. The mean D2 serum LH was 12.7±6.7 mIU/mL in the case group and 5.9±1.4 mIU/mL in the control group. Both the mean serum testosterone level and D2 serum LH level were statistically significant ($p<0.05$) between the two groups. Dipankar et al.[14] reported that PCOS patients with fasting hyperinsulinemia had high serum testosterone levels and an elevated LH: FSH ratio. Their study found a mean insulin level of 30.18 ± 13.47 mIU/ml, serum testosterone at 1.91 ± 0.21 ng/ml, and LH: FSH ratio >2.5, which aligns with the findings of this study. In this study, the distribution of the participants by insulin resistance revealed several notable findings. The mean fasting insulin was 27.3±10.7 µU/ml in the case group and 14.3±6.0 µU/ml in the control group. Serum fasting blood sugar was 5.1±0.8 mmol/L in the case group and 4.6±0.6 mmol/L in the control group. The mean HOMA IR was 4.1±1.3 in the case group and 2.4±1.2 in the control group. All three parameters, fasting insulin, fasting blood sugar, and HOMA IR, were statistically significant ($p<0.05$) between the two groups. These findings align with another research. Lunger et al. reported that 43.5% of PCOS patients exhibited elevated fasting insulin levels. Sun et al.[15] observed higher fasting insulin levels in PCOS patients compared to the control group, with values of 16.4 ± 9.15 µU/ml in the case group and 7.63 ± 3.42 µU/ml in the control group. Similarly, Begum[16] found that the mean fasting serum insulin level was 32.15 ± 12.13 µU/ml in some cases and 11.32 ± 10.02 µU/ml in the control group. Dipankar et al.[14] conducted a study on PCOS patients and found high insulin levels in 38.6% of cases. In this study, PCOS patients with HOMA-IR >3.2 exhibited more severe symptoms of hirsutism (78.60%), acanthosis nigricans (71.40%), and oligomenorrhea (85.70%) compared to those with HOMA-IR <3.2, where hirsutism (47.80%), acanthosis nigricans (43.50%), and oligomenorrhea (60.90%) were less severe. Patients with insulin resistance (IR) in PCOS had more severe symptoms of hirsutism, acanthosis nigricans, and oligomenorrhea than those without IR. Haq et al.[17] found that PCOS patients with impaired glucose tolerance had more severe symptoms of oligomenorrhea, hirsutism, and acanthosis nigricans, similar to the results of this study. In the current study, fasting lipid profile results showed that 54.90% had HDL levels below 40, while 45.10% had HDL levels above 40. For total cholesterol, 83.40% had levels below 200, and 17.60% had levels above 200. Various studies have demonstrated increased insulin resistance (IR) in PCOS women using HOMA-IR. Cakir et al.[13] reported IR in 45.5% of PCOS patients, Yildir et al.[12] found IR in 64.7%, and Begum16 identified IR in 42.3% in the case group and 12.0% in the control group. However, Enzevaie et al.[18] reported relatively less IR, found in 22.7% of 75 PCOS patients based on HOMA-IR. Amisi et al.[11] also detected IR in 39.3% of PCOS women using HOMA-IR.

Conclusion

In the context of Polycystic Ovary Syndrome (PCOS), women affected by this condition face a notably elevated risk of developing insulin resistance in comparison to their counterparts without PCOS. Importantly, PCOS patients who grapple with insulin resistance confront a heightened susceptibility to long-term complications that encompass type 2 diabetes mellitus, hypertension, dyslipidemia, coronary artery disease (CAD), and gestational diabetes mellitus. These findings underscore the critical importance of recognizing and addressing insulin resistance in PCOS patients, as it represents a pivotal factor in the increased risk of various significant health issues and underscores the need for proactive management and monitoring in this patient population.

Conflict of interest: None

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 35-37

Original Article

Comparison of Radiological Findings of Chest X-Ray with Echocardiography in Determination of Heart Size

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Abstract:

Objective: The aim of the present study was to compare the findings of CXR and echocardiography in determination of the heart size.

Methods: A cross sectional study was conducted from January 2019 to June 2019 among 100 patients attending at Cardiology Department, Cumilla Medical College Hospital, Cumilla after obtaining requisite consent from the patients. Data were collected through the assessment of patients in the Cardiology Department. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to compare the findings of CXR and echocardiography in determination of the heart size. The study was approved by the institutional ethical committee.

Results: In 100 patients's, majority 68% was between 30-50 years and 32% was between 50-90years. Among 100 patients, 64% was female and 36% was male. 36% patients were suffering from hypertension while 12% patients were suffering from Diabetes mellitus and 2% patients suffering from Dyslipidemia. Edema was present in 14% patients. 46% patients had cardiomegaly according to the findings of Chest x-ray. 26 % patients Right Ventricular end diastolic dimension in Echo was 25-45mm which was considered as a cardiomegaly. 36% patients Left Ventricular end diastolic dimension in Echo was 55-60mm which was considered as a cardiomegaly. 12% patient's left ventricular ejection fraction was 37-50%.

Conclusion: Echocardiography is superior to chest radiography for providing a better assessment of cardiomegaly.

Keywords: Echocardiography, Cardiomegaly.

Introduction

Cardiomegaly, including ventricular enlargement, is one of the manifestations of the cardiovascular disease. The distribution of the disease is worldwide and is common amongst those having cardiomyopathy, valvular and congenital heart disease, heart failure, cor pulmonale, pulmonary hypertension, high cardiac output States and chronic pressure overload.[1] It is commonly observed in our routine clinical practice that a significant number of echocardiograms are requested in hospitalized patients based on the sole interpretation of admission chest radiography as having cardiomegaly without making any detailed appropriate measurement. It is very important to adequately evaluate cardiac dimensions in the clinical setting. Therefore, assessing heart size by measuring the cardiothoracic ratio (CTR) still remains as a useful diagnostic tool in chest radiography evaluation.[2] It has long been accepted that a cardiothoracic ratio (CTR) greater than 50% on a posterior-anterior (PA) chest radiograph (CXR) is representative of cardiomegaly.[3] However, there is a large variation in the subjective judgment of cardiac enlargement (cardiomegaly).[4] However, the diagnosis of cardiomegaly can be made more accurately by other more expensive techniques like cardiac echocardiography, magnetic resonance imaging (MRI), and computed tomography (CT). The echocardiography is commonly superior to other low-technological methods that are used to determine the size of the heart and its chambers.[5] Although

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Received: 20.09.2023 **Accepted**: 20.12.2023

echocardiography is considered as gold standard for the diagnosis of cardiomegaly, it is costly and needs trained personnel for performing and interpreting the results of this diagnostic procedure.[6]

Materials & Methods

A cross sectional study was conducted from January 2019 to June 2019 among 100 patients attending at Cardiology Department, Cumilla Medical College Hospital, Cumilla after obtaining requisite consent from the patients. Every patients had undergone echocardiography and PA CXR maximum within two days. If cardiothoracic ratio >0.5 on a postero-anterior radiograph then it's considered as a cardiomegaly. RVEDD and LVEDD were used to measure the echocardiographic size of the heart. Normal RVEDD and LVEDD was less than 25 mm and 55 mm respectively. More than or equals 25mm and 55mm respectively considered as cardiomegaly. The study was approved by the institutional ethical committee. The relevant information was entered into the predesigned proforma to compare the findings of CXR and echocardiography in determination of the heart size. The collected data were entered into the computer and analyzed by using SPSS (version 20.1).

Result

In 100 patients's, majority 68% was between 30-50 years and 32% was between 50-90years. 36% patients were suffering from hypertension while 12% patients were suffering from Diabetes mellitus and 2% patients suffering from Dyslipidemia. Edema was present in 14% patients **(Table-I)**

Table-I: Distribution of the respondents by socio-demographic characteristics and clinical feature (n=100)

Sex	Frequency	Percent
Male	36	36.0
Female	64	64.0
Age		
30-50 years	68	68.0
50-90 years	32	32.0
Smoking habit		
smoker	22	22.0
Non smoker	78	78.0
Hypertension		
present	36	36.0
absent	64	64.0
DM		
present	12	12.0
absent	88	88.0
Dyslipidemia		
present	2	2.0
absent	98	98.0
Odema		
Present	14	14.0
Absent	86	86.0

Among 100 patients, 64% was female and 36% was male. (Figure-I)

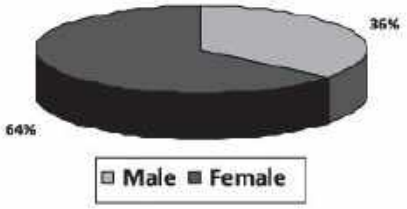

Figure-I: Pie chart showing sex distribution of the population

Among the 100 participants, 46% patients had cardiomegaly according to the findings of Chest x-ray. 26 % patients Right Ventricular end diastolic diamension in Echo was 25-45mm which was considered as a cardiomegaly. 36% patients Left Ventricular end diastolic diamension in Echo was 55-60mm which was considered as a cardiomegaly. 12% patients left ventricular ejection fraction was 37-50%. (Table-II)

Table-II: Distribution of the respondents by chest x-ray and echocardiography findings

Clinical finding	Frequency	Percent
Cardiothoracic ratio in chest x-ray		
< 0.5 on a PA film	54	54.0
> 0.5 on a PA film (cardiomegaly)	46	46.0
Right Ventricular end diastolic diamension in Echo		
20-24 mm	74	74.0
25-45 mm (cardiomegaly)	26	26.0
Left Ventricular end diastolic diamension in Echo		
29-54 mm	64	64.0
55-60 mm (Cardiomegaly)	36	36.0
Left ventricular ejection fraction		
37-50%	12	12.0
51-74%	88	88.0

Discussion

All together a total of 100 patients were examined during the study period. In 100 patient's, majority 68% was between 30-50 years and 32% was between 50-90years. Near to similar results were obtained in the study conducted by Alghamdi et al (2020). In their study titled "Study of cardiomegaly using chest xray" stated that majority of the patients were between 48-58 years.[7] In our study majority of the participants were female 64%. Dissimilar results were obtained in the study conducted by Chana et al. (2015). In their study majority of the participants were male 56.2%.[8] In our study, 46% patients had cardiomegaly according to the findings of Chest x-ray. 26 % patients Right Ventricular end diastolic dimension in Echo was 25-45mm which was considered as a cardiomegaly and 36% patients Left Ventricular end diastolic dimension in Echo was 55-60mm which was considered as a cardiomegaly. Dis-similar results were obtained in the study conducted by Biharas Monfared et al. In their study they stated that according to CXR and Echocardiography, 24.9% and 50.8% patients had cardiomegaly respectively.

Conclusion

Echocardiography is superior to chest radiography for providing a better assessment of cardiomegaly. Therefore we should be reminded that when we see an enlarged cardiothoracic ratio on chest radiograph it may not cardiomegaly. The echocardiography will give accurate measurement of heart.

Acknowledgements

The authors are grateful to the entire staff of the Cardiology Department of Cumilla Medical Hospital, Cumilla for their cooperation and support during the study period.

Conflict of interests: None

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 38-41

Original Article

Comparison on the efficacy of analgesia using Transversus Abdominis Plane (TAP) block and Intravenous Diclofenac after caesarean delivery under spinal anaesthesia

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Abstract:

Background: The Transversus Abdominis Plane(TAP) block is a regional field block that provides effective analgesia after lower abdominal surgeries as postoperative analgesia is a major component of perioperative care.

Objective: To evaluate the effectiveness of intravenous Diclofenac and Ttransversus Abdominis Plane (TAP) block analgesia following caesarean delivery (LUCS) under spinal anesthesia (SAB).

Methods: In this prospective, observational study, 40 healthy participants who underwent LUCS under SAB were included. Group A (n = 20) received a bilateral TAP block with Bupivacaine 0.5% (1.5 mg/kg), while Group B (n = 20) were given intravenous diclofenac sodium. Adverse consequences, the overall length of postoperative analgesia, pain rating scale scores, and patient satisfaction levels were also documented. P value less than 0.05 was considered to be significant.

Results: In comparison to Group B (8.20±0.90 h), Group A's total analgesic duration was longer (16.30±1.16 h) it was statistically highly significant. The total amount of analgesics needed in the first 24 hours after surgery was lower in Group A (104.19±28.3 mg) than that of Group B (165.14±32.6 mg) which was statistically significant. Mean pain rating scale scores in Group A were significantly lower than those of Group B at 6, 12 and 24 post-operative hours. Patients in Group A also reported higher levels of satisfaction than those of Group B, the difference was statistically highly significant.

Conclusion: Compared to intravenous diclofenac sodium, bilateral TAP block Bupivacaine following LUCS under SAB offers superior post-operative analgesia and better patient satisfaction.

Keywords: Transversus Abdominis Plane (TAP) block, Caesarean Delivery (LUCS), Spinal Anesthesia (SAB), Intravenous Diclofenac Sodium.

Introduction

The procedure of a Caesarean birth (LUCS), which is frequently carried out under spinal anesthesia (SAB), is often followed by moderate to severe postoperative pain. Lack of sufficient analgesia can result in an extended hospital stay, an inefficient recovery, more consumption of medications and overall patient discontentment. In order to permit early rehabilitation and the mother's mobilization to be able early nursing & preventing thromboembolic event, effective management of pain is extremely important.[1] After caesarean delivery (LUCS), a number of peripheral nerve blocks can be employed to relieve pain. The transversus abdominis plane (TAP) block is one of the most popular methods for regional analgesia. For many abdominal surgeries, it is a crucial part of the multimodal approach to post-operative analgesia.[2] An NSAID, diclofenac sodium possesses analgesic and anti-inflammatory characteristics. Since it works by preventing tissue prostaglandin synthesis in reaction to cellular damage and uterine contraction, it is beneficial for treating post-caesarean section pain.[3]

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Received: 05.11.2023 **Accepted**: 19.02.2024

This study compared the analgesic efficacy of transversus abdominis plane block with injectable diclofenac sodium as part of a multimodal analgesia regimen in caesarean section under spinal anaesthesia. Determining the mean length of postoperative analgesic period was our primary objective. Secondary goals included determining the total amount of analgesics given during the first 24 hours for post-operative analgesia, the amount of pain alleviation experienced at rest and when moving from a supine to a sitting position, patient satisfaction levels, and the observation of any adverse effects.

Materials and Methods

After receiving approval from the Institutional Ethical Review Committee, this prospective, randomized study was carried out in the Department of Anesthesiology at the Dhaka National Medical College Hospital in Bangladesh from June 2021 to May 2022.

For the study, 40 female patients between the ages of 18 and 40 who were scheduled for both elective and urgent caesarean sections under spinal anesthesia were included. Patients with body weights<40kg or >90 kg, a history of drug allergies to study drugs (diclofenac sodium, Bupivacaine, metoclopramide), contraindications to regional anesthesia (bleeding diathesis, infection at the site of block, and peripheral neuropathy), severe medical conditions like severe pre-eclampsia and eclampsia, and patients with intraoperative complications like postpartum hemorrhage and severe fetal distress were excluded from the study.

Patients were randomly assigned into two groups, with 20 patients each in Group A (TAP block) and Group B (intravenous diclofenac sodium), following the receipt of informed written consent. Computer-generated random number sequences in a 1:1 ratio were used for the randomization process. Before the procedure, a comprehensive preoperative assessment was conducted. Prior to surgery, all patients received a detailed explanation of the numerical rating scale (NRS) score and were given instructions on how to use it to assess post-operative pain. Esomeprazole 40 mg intravenously (IV) and Metoclopramide 10 mg intravenously (IV) were administered as aspiration prophylaxis to all patients undergoing Caesarean Delivery (LUCS) while they were kept nil by mouth (NPO) for 6 hours.

After receiving the patients in the operating room, the electrocardiography (ECG) leads, non-invasive blood pressure (NIBP) cuff, and pulse oximeter probe (SPO2) were attached, and the baseline values were noted. Spinal anesthesia (SAB) was carried out at the L3-L4 intervertebral space using hyperbaric Bupivacaine (0.5%) 1.8-2.0 ml with 25 mg fentanyl after taking proper aseptic measures. According to the randomized group assignment determined at the start of the study, postoperative analgesia was given following the surgery. Patients assigned to Group B received 75 g of intravenous diclofenac sodium after the delivery of the baby.

Patients in Group A in supine position a blunt needle is inserted perpendicular to the skin just cranial to the iliac crest and just anterior to the edge of the latissimus dorsi muscle. A resistance is felt as the external oblique aponeurosis is encountered, followed by a "give" as it is pierced and a second "give" as the needle passes through the internal oblique aponeurosis. After aspiration, 20 ml solution of 0.5% Bupivacaine is injected.

After 30 minutes of observation, the patients were sent to the post-operative care unit. Every 2, 4, 6, 12 and 24 hours, a research assistant who was blind to the allocation graded the intensity of the pain of the patients, while at rest and while moving. Numerical pain rating scale (NRS) score was used to measure pain (0=having no pain and 10 = having the worst amount of agony). Rescue analgesia in the form of injectable diclofenac 1 mg/kg was administered to patients upon request or when their NRS was more than 4. The quantity of analgesic drugs needed 48 hours after surgery was also noted.

A 4-point ordinal scale was used to assess the level of sedation in patients: (1 = for being fully awake and attentive, 2 = for being awake but drowsy and reacting to verbal cues, 3 = for being arousal and responding to physical stimuli, and 4 = for not being arousal and not responding to physical stimuli). Using a 4-point scale, post-operative nausea and vomiting was graded as follows: (0 = none, 1 = nausea, 2 = retching/dry vomiting, and 3 = vomiting). On a scale of 1 to 4, patients were asked to rate their level of satisfaction with postoperative pain management (1 = being highly satisfied, 2 = being satisfied, 3 = being unhappy, and 4 = being extremely dissatisfied). Additionally, associated side effects were noticed. All patients had their postoperative hemodynamic conditions monitored regularly and the readings were recorded.

The mean and standard deviation (SD) of the data were computed after they had been gathered, tabulated, and analyzed using Statistical Package for the Social Sciences (SPSS) version 20. The Student's t-test was used for comparing demographic data. The unpaired Student's t-test was utilized for investigating additional measurements such as analgesia duration, the overall amount of rescue analgesics needed, NRS score, and hemodynamic indicators. P value < 0.05 considered as significant.

Results

A total of 40 participants were involved in the study. Among them, 20 patients were randomly assigned to get a TAP block during the study, and the remaining 20 received intravenous diclofenac sodium. The group getting TAP block is more satisfied and efficacy of analgesia is higher than the group getting IV diclofenac sodium.

Table-I: Demographic variables in both groups revealed no significant differences between two groups.

Characteristics	Mean± SD		p-value
	Group-A	Group-B	
Age (years)	22.16±3.11	21.98±2.73	0.846
BMI (kg/m2)	20.49±2.86	20.14±2.59	0.687
Duration of surgery (mins)	45.63±4.26	46.85±3.78	0.344

BMI=Body mass index; SD=Standard deviation

Table-II: Post-operative pain score (Numerical rating scale) at rest and at movement

The numerical rating scale of pain severity at rest and during movement was not significantly different at 2 and 4 post-operative hours, however it was significantly lower (P < 0.05) in group A than group B at 6, 12 and 24 post-operative hours.

Time Interval (h)	NRS on rest (Mean± SD)		p-value
	Group-A	Group-B	
2	2.39±0.56	2.71±0.94	0.128[NS]
4	2.98±0.81	3.27±0.64	0.216[NS]
6	4.49±1.06	5.32±1.45	0.045[S]
12	5.11±1.23	6.04±1.45	0.034[S]
24	4.73±1.08	5.42±1.03	0.045[S]

Time Interval (h)	NRS on movement (Mean± SD)		p-value
	Group-A	Group-B	
2	2.42±0.85	2.71±0.94	0.312[NS]
4	3.05±0.54	3.47±0.89	0.079[NS]
6	4.14±0.63	5.13±1.34	0.004[S]
12	5.20±0.97	5.96±1.04	0.021[S]
24	4.83±0.62	5.79±1.08	0.001[S]

S=Significant

NS= Not Significant

Table-III: Study parameters in the two groups

In comparison to Group B, Group A's mean time to administer the first dosage of rescue analgesia was shown to be significantly longer (P<0.001). Group A's total analgesic duration was significantly longer (P<0.001) than Group B's. The mean dose of total analgesics consumed in the first 24 hours following surgery was significantly lower in Group A than in Group B (P<0.001). Patient satisfaction in Group A was significantly higher (P<0.001) than that of Group B.

Observations	Mean± SD		p-value
	Group-A	Group-B	
First analgesia request after			
LUCS (mins)	256.30±75.42	86.20±24.15	<0.001[S]
Total duration of analgesia (hrs)	16.30±1.16	8.20±0.90	<0.001[S]
Rescue analgesic (diclofenac)			
consumption over 24h (mg)	104.19±28.3	161.14±32.6	<0.001[S]
Patient satisfaction score	2.8±0.3	1.3±0.7	<0.001[S]

S=Significant

Discussion

At present, the Transversus Abdominis Plane (TAP) block is frequently utilized to provide postoperative multimodal analgesia for various types of abdominal surgeries. Numerous research has shown that the effectiveness of TAP block as multimodal analgesia reduced postoperative analgesic consumption and complications.[4-6] According to recommendations based on scientific evidence, NSAIDs have become crucial for managing acute post-operative pain. Numerous studies additionally illustrate the advantages of intravenous diclofenac administration during cesarean deliveries.[7] This study was designed to compare the effects of regional analgesia technique employing TAP block with a non-opioid parenteral analgesic diclofenac aqueous in patients undergoing caesarean section in order to determine the most effective method of analgesia.

In comparison to patients who received intravenous diclofenac following surgery, our study found that patients who underwent TAP block had lower NRS scores at rest and during movement in the post-operative period. The outcomes of Jadon et al.[8] and Kahsay et al.[9] were also similar to this. The current study also demonstrated that, when compared to the

control group receiving intravenous diclofenac sodium, bilateral injection of 20 ml of Bupivacaine 0.75% as part of the multimodal analgesic regimen of TAP block resulted in decreased postoperative pain severity, significantly decreased rescue analgesic consumption, and a significantly prolonged time for the first analgesic request in the first 24 postoperative hours. The findings were similar to the study performed by Kanta et al.[3] Compared to those who received intravenous diclofenac in this research, the majority of the patients in the TAP block were extremely satisfied with their level of pain reduction. In a similar research by Belavy et al.[10] also found that TAP block improved patient satisfaction.

The sample size of our experiment was insufficient to evaluate the safety of TAP block, which constitutes a limitation of our investigation. Another limitation was, only elective cesarean sections were the subjects of this research. Patients who undergo emergency cesarean sections encounter outcomes which differ from those shown in our study.

Conclusion

An ideal method of pain relief after LUCS should be cost effective & safe for both mother and baby. From that study in can be concluded that, TAP block significantly improved post-operative analgesia in women undergoing LUCS.

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J. Dhaka National Med. Coll. Hos. 2024; 30 (01): 42-46

Case Report

Adult Midgut Malrotation with Duodenal Stricture: Diagnostic Dilemma and Its Management - A Case Report

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Abstract:

Intestinal malrotation is a rare congenital disease due to abnormal intestinal rotation and fixation of the intestinal tract in the early embryonic state. Adult cases are very rare. Midgut malrotation typically presented during the first few months of life but may sometimes appear later in life, causing difficulties and mistakes in diagnosis. An unusual presentation of this condition has led to diagnostic dilemma. Diagnosis is delayed because respective symptoms were not adequately considered in adults. We present a case report of 35 years old Muslim male presented with history of gradually increasing vague abdominal pain at upper and mid abdomen for 5 months with history of vomiting after heavy meal. On examination we found that patient was anxious and ill looking, Body stature average but patient was malnourished and dehydrated. Mild tender epigastric region. No palpable lump. No organomegaly. Succussion splash absent. Endoscopy of upper GIT was normal and full colonoscopy found also normal. Barium follow through x-ray revealed stricture at 3rd part of Duodenum with malrotation of gut. Open Ladd procedure with gastrojejunostomy under G/A was performed.

Keywords: Malrotation, Duodenal stricture, Ladd procedures, Congenital Ladd's band.

Introduction

Midgut malrotation is an anomaly of fetal intestinal rotation that usually presents in the first month of life. It is rare in adulthood.[1] There is either lack of or incomplete rotation of the fetal intestines around the axis of the superior mesenteric artery during fetal development.[2] Most patients present with bilious vomiting in the first month of life because of duodenal obstruction or a volvulus. The true incidence in adults is difficult to estimate because most patients remain asymptomatic and their conditions are, therefore, never diagnosed. Approximately 90% of patients with malrotation are diagnosed within the first year of life, of whom 80% are diagnosed within the first month of life.[3] The frequency of occurrence has been reported as 1/6000 of all live births, and most cases are present in the first month of life and 90% within the first year.[4,5] The number of cases in which symptoms appear in adults is small, comprising only 0.2 to 0.5% of overall cases.5 Surgical therapy remains the mainstay of treatment regardless of age at presentation. The most commonly used approach is the Ladd procedure, which involves counterclockwise reduction of the volvulus if present, division of any Colo-duodenal bands (Ladd's band), widening of the mesenteric base to prevent repeated volvulus, and prophylactic appendicectomy.[6] Laparoscopic approach has become more common since the report by van der Zee and Bax.[7] Here we document the case of a midgut malrotation with duodenal stricture an adult male.

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Received: 20.09.2023 **Accepted:** 15.11.2023

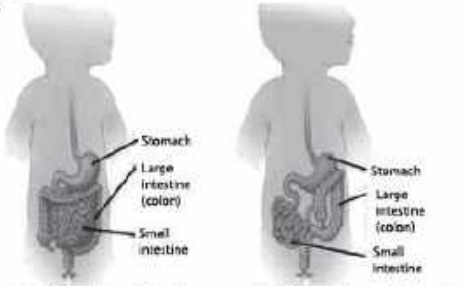

Figure-I: Normal position of intestine and malrotation of intestine.

Case report

A thirty five years old Muslim male, born in Jhinaidah presented to the Outpatient Department with complaints of abdominal pain for 5 months involving upper and mid abdomen (Lt Lumber- Lt Hypochondrium- Epigastric- Rt Hypochondrium- Rt Lumber region), gradual onset, colicky in nature. Pain was aggravated by food intake and patient felt fullness after eating. Patient can take liquid diet without any problem. Patient do not have any history of heart burn and acidity. Pain was associated with vomiting, anorexia and constipation. Vomiting occurred after solid meal, induced, contained partially digested and undigested food particle, sour in taste, yellowish green in color, foul smelling. He occasionally uses laxatives for constipation relieve. Actually, no accurate measurement of weight loss but patient felt losing weight during last 5 months. According to his mother, he suffered abdominal pain (whole abdomen) with anorexia and constipation from the age of 2 years. His parents took him to local doctors, but there was no diagnosis. Pain was relieved by analgesics. He suffered similar kind of pain till 12 years of age. After that he was relatively healthy (occasional pain ignored as thought about PUD pain). There is no other significant past medical or surgical illness. He used to take antacid and some other medication, couldn't mention the name. He is a smoker taking 10-15 sticks per day in last 16 years. He is non-alcoholic and non-betel nut chewer. There is no known allergy to medications or food.

On examination, he was anxious and ill looking. Body stature average but malnourished. He was mildly anemic, mildly dehydrated. Shape of the abdomen was normal. Flank was not full. Umbilicus centrally placed, inverted. Hair distribution was normal. Skin condition was normal, no scar mark. Engorged vein was absent. Visible peristalsis and visible pulsation were absent. There was no obvious swelling and hernial orifices are intact. Mild tenderness present in epigastric region but other quadrants are nontender. No palpable lump. Liver, spleen not palpable. Kidney not ballotable. Succussion splash absent. There were no significant general examination findings except mild anaemia and dehydration.

Ultrasonography was done and showed normal findings. Endoscopy of upper GIT was normal. Full colonoscopy was also normal. Tumor marker CA-125 and CA-19.9 was within in normal range. Barium follow through x-ray revealed suggestive of stricture at 3rd part of duodenum with malrotation of gut [Figure-II]. Other investigations showed, RBS- 9.3 mmol/L, FBS- 5.37 mmol/L, Serum Creatinine- 1.21mg/dl, CXR P/A view- Normal, ECG- Normal, Echocardiography- Good LV function LVEF 63%., Blood group- B+ve, HBsAg- negative, Anti HCV- negative, Serum Albumin- 3.5 gm/dl, MT- negative, Rapid antigen test for covid 19- negative.

Optimization and preparation of patient for operation done by plenty of liquid diet for dehydration improvement. Correction of electrolyte imbalance by Inf. 5%DNS + Inj. KCl and Gastric lavage: Three days preparation with wide bore nasogastric tube, Irrigation with 200ml normal saline every 4 hourly until clear fluid comes out, In between the lavage, only plain water or liquid diet was allowed. Patient underwent laparotomy and open Ladd procedure. The Ladd procedure is the operation of choice for rotational anomalies of the intestine.

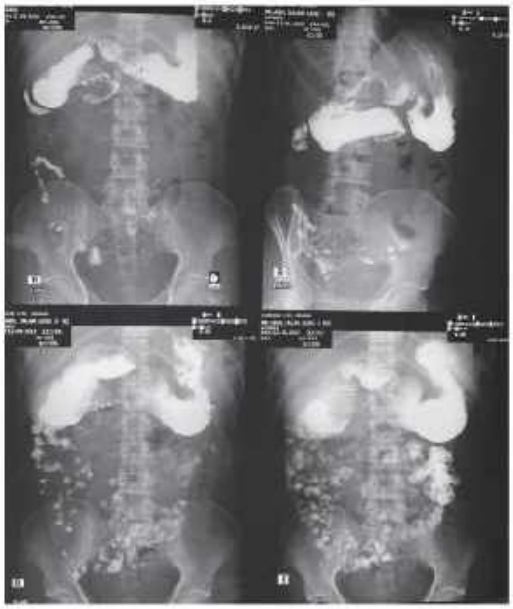

Figure-II: Barium follow through x-ray revealed suggestive of stricture at 3rd part of duodenum with malrotation of gut.

Conventional Ladd Procedure includes (Figure-III)

a. Twisted bowel was eviscerated.

b. The bowel is de-rotated in a counterclockwise fashion.

a. The peritoneal attachment between the cecum and retroperitoneum (Ladd band) was divided.

b. The base of the mesentery was widened, and an appendicectomy was performed.[8]

We had done midline laparotomy and malrotation of gut found. Caecum and ileum found into left side and descending colon is found in the right side of abdominal cavity. Ladd's band is found at caecum to duodenum, encircling duodenum adherent to liver and gall bladder. De-rotation of gut is done. Ladd's band was divided. Appendicectomy was done.

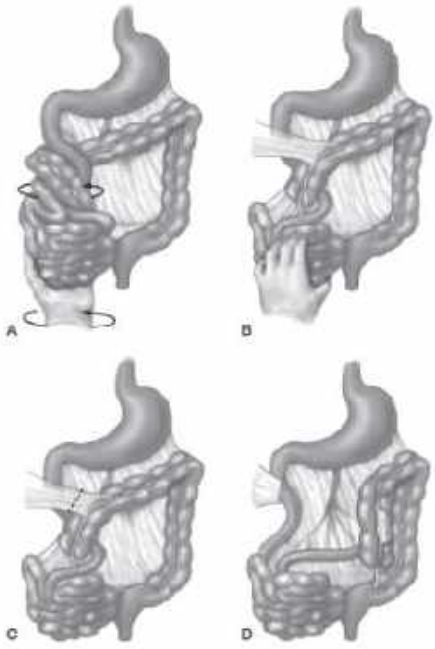

Figure-III: Ladd Procedure.

Gastrojejunostomy was done because of stricture at duodenum. 2 drain tube is given one in the hepatorenal pouch and another in the pelvis. After securing all the bleeding points, abdominal cavity is closed in layers. Patient was recovered in HDU. In the post operative period, patient developed electrolyte imbalance and superficial surgical site infection. Patient was discharged after treating electrolyte imbalance and surgical site infection. Patient was advised to avoid strenuous activity. After 14 days of secondary suture, stitches were removed as the wound was healthy.

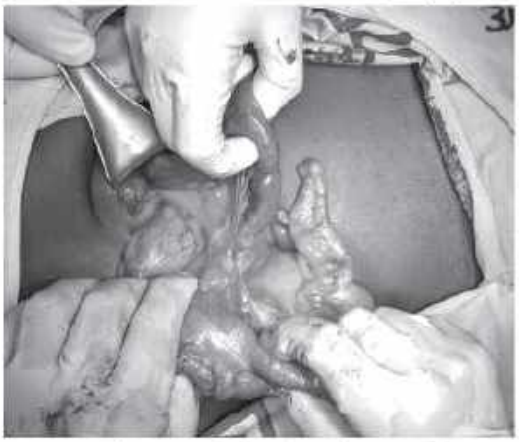

Figure-IV: Photograph showing abnormal location of appendix and congenital Ladd's band.

Discussion:

Rotational abnormalities of the intestine occur when the normal embryologic rotation and fixation of the mesentery fail to take place.[9] Intestinal malrotation, especially in adults, is rare.[5,10] So a single surgeon is likely to encounter only a small number of surgical cases or surgeons may never experience it. In adults, it may cause chronic, but indistinct symptoms that are often difficult to diagnose. Adult presentation of malrotation is a difficult diagnosis because of the low incidence of the disorder. Patients with intestinal malrotation who were not diagnosed until adulthood may present with a variety of chronic symptoms, including nausea, vomiting, diarrhea, vague abdominal pain, early satiety, bloating, dyspepsia, and peptic or duodenal ulcer disease. Unfortunately, many patients never receive surgical referral and are instead labeled with functional or psychiatric disorders.[11] There may be a significant number of patients with malrotation who were undetected in the neonatal period either because they were asymptomatic, or because their symptoms were mild and misinterpreted. As these patients grow into adolescence and adulthood, they may continue to have misinterpreted symptoms, remain asymptomatic, or present with new onset of acute or chronic symptoms later in life, as did our patient. Adults, however, present with vague symptoms such as vomiting (bilious or non-bilious), weight loss, and recurrent or colicky abdominal pain (often postprandial).[12-14] Intestinal obstruction, diarrhea, malabsorption, peritonitis, and septic shock also

have been reported in the adult group.[13] Timing and frequency of the pain also can be variable.[15] It is these vague symptoms along with the relative rarity of adult presentation of malrotation that often lead to diagnostic dilemma. Barium follow through x-ray still plays an important role in the diagnosis of duodenal disorders. For the best management of duodenal diseases, barium studies in combination with cross-sectional imaging modalities may offer detailed evaluation of the duodenum and its surrounding organs. However, CT, Ultrasound and MRI all can provide excellent cross-sectional anatomic orientation, which allows accurate pre-operative evaluation.[16] The treatment for intestinal malrotation is generally the Ladd procedure. Important considerations regarding Ladd procedure include the following: release of any midgut volvulus, resection of the abnormal adhesive retroperitoneal band (Ladd's band) between the duodenum and the right colon mesentery, opening the base of the mesentery including the SMA, performing prophylactic appendicectomy, and rearranging the intestinal tract.[17] We suggest that resection of the abnormal band relieves compression of the duodenum or jejunum. The opening of the base of the small intestinal mesentery is especially important to create sufficient space for the small intestine and the colon, removing one of the causes of malrotation. In our cases, the clinical symptoms were thought to have been caused by the duodenum being compressed by the abnormal retroperitoneal band and the right colonic mesentery. The band is connected to the adhesion between the pre pancreatic fascia and the colonic mesentery. This adhesion is considered to be more severe in adult cases than in infant cases because of the longer period of illness. Opening the base of the mesentery is also thought to be important. The narrow base of the mesentery could lead to the patient having subsequent midgut volvulus and obstruction with potential vascular catastrophe.[18] Opening the base of small intestinal mesentery is therefore crucial to reducing the likelihood of midgut volvulus.[19] As there was stricture at the 3rd part of duodenum, we did gastrojejunostomy in addition to Ladd procedure.

Conclusion

Intestinal malrotation should be considered as a differential diagnosis of abdominal disorders in older children and adults presented with vague abdominal pain and vomiting. The diagnosis of intestinal malrotation associated with duodenal obstruction secondary to Ladd's bands should be considered in adult patients presenting with duodenal obstruction and malrotation of the small intestine with the cecum in the medial position. We believe that barium follow through x-ray is still the method of choice for the diagnosis of such malrotations in resource limited setting. Laparotomy and laparoscopy are alternative and feasible techniques with low rates of complications for the treatment of intestinal malrotation in adults.

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