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The Satkhira Medical College Journal a biannual (January & July) journal published by the editorial board on behalf of Satkhira Medical College Teachers' Association. Each issue includes editorial, original articles, review articles and case reports of exceptional merit on any discipline of medical science.

Submission of manuscripts

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Manuscripts should be typed on one side of good quality paper, with margins of at least 25 mm and using double space throughout. Each component of the manuscript should begin on a new page in the sequence of title page, abstract, text, references, tables, and legend for illustrations. The title page should include the title of the paper, name of the author(s), name of the department(s) to which the work should be attributed. The text should be presented in the form of introduction, materials and methods, results and discussion. The authors should sign a covering letter mentioning that final manuscript has been seen and approved by all authors. The letter should mention the name of the person (with address and telephone number) responsible for negotiation concerning the manuscript.

Abstracts

Abstracts should be provided on a separate page an abstract of not more than 250 words.

They should briefly describe the problem being addressed in the study, how the study was performed, the salient results and what the authors conclude from the results.

Table

Each table should be typed in on separate sheet. Table should have brief title for each, should be numbered consecutively using Roman numbers and be cited in the in consecutive order internal horizontal and vertical rules should not be used. Results should be presented in logical sequence in the text, tables or illustration. Do not repeat in the text all data in the tables or illustrations; emphasize or summarize only important observations.

Drug names

Generic names should generally be used. When proprietary brands are used in research, include the brand name in parentheses in the Methods section.

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Figure should be professionally designed symbols, lettering and numbering should be clear and large. The back of each figure should include the sequence number and the proper orientation (e.g., "top"). Photographs and photomicrographs should be supplied as glossy black and white prints unmounted. Legend for each illustration should be submitted in separate sheets. All photographs, graphs, and diagrams should be referred to as figures numbered consecutively in the text.

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Emphasize the new and important aspects of the study and the conclusion that follow from them. The detail data or other material given in the Introduction or the results section should

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For reference, use author number style (Vancouver) whice is based on ANSI standerd adapted by the National Library of Medicine (NLM). References should be number consecutively in the order in whice they are first mentioned in the text. The titles of journals should be abbreviated according to the style used in Index Medicues. If author's number is more then six then write "et al." after first one or two author's name.

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EDITORIAL

Molnupiravir in COVID-19

Professor Dr. A. H. S. M. Kamruzzaman

The quest for effective drugs to treat COVID-19 has been a priority since the outbreak of the disease. Majority of the drugs used so far has been greatly restricted by the need for intravenous administration, as well as unstable concentrations in plasma and variable antiviral activity in different organelles. Four neutralizing antibodies (Bamlanivimab, Etesevimab, Casirivimab, and Imdevimab) have been approved by the United States Food and Drug Administration; however, their high cost and need for intravenous administration render them inaccessible to the public. Therefore, effective and economical oral drugs are the priority for the prevention and control of COVID-19, because they can be used after exposure to SARS-CoV-2 or at the first sign of COVID-19 as well as increase patient compliance to therapy [1].

Despite the availability of vaccines, there remains an urgent need for antiviral drugs with potent activity against SARS-CoV-2, the cause of COVID-19. Millions of people are immune-suppressed and may not be able to mount a fully protective immune response after vaccination. There is also an increasingly critical need for a drug to cover emerging SARS-CoV-2 variants, against which existing vaccines may be less effective. So, need of oral drug is not erroneous.

Here, we describe the evolution of Molnupiravir (EIDD-2801, MK-4482), a broad-spectrum antiviral agent originally designed for the treatment of Alphavirus infections, into a potential drug for the prevention and treatment of COVID-19. Molnupiravir is a small-molecule ribonucleoside prodrug of N-hydroxycytidine (NHC), which has activity against SARS-CoV-2 and other RNA viruses and a high barrier to development of resistance [2, 3]. After oral administration of Molnupiravir, NHC circulates systemically and is phosphorylated intracellularly to NHC triphosphate. NHC triphosphate is incorporated into viral RNA by viral RNA polymerase and subsequently misdirects the viral polymerase to incorporate either guanosine or adenosine during viral replication. This leads to an accumulation of deleterious errors throughout the viral genome that ultimately render the virus non-infectious and unable to replicate [4].

In the patients with available sequence data, Molnupiravir was found to be active against the three predominant circulating variants (delta, gamma and mu) and showed a modest antiviral effect [5]. Double blind randomized placebo controlled trial revealed early treatment with Molnupiravir reduced the risk of hospitalization or death in at-risk, unvaccinated adults with Covid-19. Even oral Molnupiravir was without evident safety concerns, when initiated within 5 days after the onset of signs or symptoms. Participants in the trial were randomly assigned to receive 800 mg of Molnupiravir or placebo twice daily for 5 days [6]. However, Molnupiravir is not recommended for women who are pregnant or breast-feeding or for those who might become pregnant during treatment. It is quite evident that vaccines must be the primary mode of protection against SARS-CoV-2; however, orally

bioavailable medications will become an essential tool for physicians in the management of this horrible disease [5].

While COVID-19 is prevalent, the combined use of immunomodulatory or anti-inflammatory agents, antivirals, and host-factor antagonists might be the optimal therapy for the disease. The emergence of affordable and powerful oral anti-COVID-19 drugs and the increased uptake of vaccination will bring hope for the end of this COVID-19 pandemic.

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EDITORIAL

ORIGINAL ARTICLES

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Original Article

Evaluation of Adenosine Deaminase (ADA) and Gamma Interferron in Combination for the Diagnosis of Pulmonary and Extra-pulmonary Tuberculosis

Sunil Krishna Baul[1], Shaikh Nazmus Saqueeb[2], Maitree Majumder[3], Ahmed Al Maaruf[4], Mohammad Ali[5], Mokerroma Ferdous[6], Kallyanashish Sardar[7]

ABSTRACT

Introduction: The most common form of tuberculosis (TB) is pulmonary tuberculosis (PTB) but outside the lungs, isolated TB at any site in the body is referred as extra-pulmonary tuberculosis (EPTB). The diagnosis of PTB and EPTB is harder if smears and cultures are negative. Extra pulmonary tuberculosis (EPTB) is a growing problem worldwide. Its diagnosis is difficult and often late due to the nature of the disease, the diversity of clinical pictures as well as its minor epidemiological importance. In addition to standard TB diagnostic techniques, use of new biochemical markers (surrogate markers like ADA, LDH, gamma interferon etc.) are increased. **Objectives:** To evaluate the diagnostic value and accuracy of serum ADA and gamma interferon (QFT-G) for the diagnosis of PTB and EPTB. **Methods:** In this hospital based cross sectional study, by convenient and purposive sampling technique, 20-90 years aged 131 patients (male 98, female 33) were enrolled. The study was carried out in the Pathology & Microbiology Departments of NIDCH, Dhaka. S. ADA & QFT-G were done and the results were compared with the culture and histopathology results. Performance tests were done. Prevalence was measured at 95% CI. Statistical significance was set at $p<0.05$. **Results:** 89 (67.9%) patients had pulmonary tuberculosis (PTB). The rest 42 (32.1%) patients had extrapulmonary tuberculosis (EPTB). ADA in all the fluid samples was higher than normal. Level of ADA and gamma interferon in serum of all patients was significantly high. TB pleural effusion was detected in 64% cases. The sensitivity, specificity, positive predictive values, negative predictive values and accuracy of ADA and gamma interferon was calculated both in PTB and EPTB. It was found for ADA (SEN 92.70%, SPE 90.03%, PPV 92.80%, NPV 90.06%) and for gamma interferon (SEN 93.01%, SPE 91.64%, PPV 93.73%, NPV 91.18%) in PTB; and for ADA (SEN 94.39%, SPE 92.46%, PPV 89.80%, NPV 95.42%) and for gamma interferon (SEN 94.88%, SPE 93.65%, PPV 90.04%, NPV 95.82%) in EPTB respectively. When calculated in combination, the sensitivity and specificity was 100% & 50% respectively in both PTB and EPTB, and positive & negative predictive values of ADA and gamma interferon in combination were 94% & 91.58% in PTB and 90.43% & 96.71% in EPTB respectively. **Conclusion:** The diagnostic accuracy of ADA and gamma interferon may be low when tests are done in single. But, when they are used in combination, it is significantly high.

Keywords: Pulmonary Tuberculosis (PTB), Extra-pulmonary Tuberculosis (EPTB), Adenosine Deaminase (ADA), Gamma Interferron (QFT-G)

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Introduction and Rationale

Tuberculosis is a common disease throughout the world, especially in developing countries. Millions of people have died from tuberculosis (TB), a leading chronic infectious killer of all age groups and the second most common infectious disease worldwide. It is an infection with human strains of Mycobacterium tuberculosis [1, 2]. The most common form of the disease, which is essential for the spread of TB, is pulmonary (PTB). Tuberculosis can affect any organ in the body. Extrapulmonary tuberculosis (EPTB) is referred to isolated TB at any site in the body outside the lungs. Although TB can be fully cured with the use of appropriate drugs, the major hurdle to treatment for TB lies in the late diagnosis of the disease due to the lack of simple and cost-effective diagnostic procedures. Although the isolation of tuberculous bacilli from clinical specimens is the gold standard for diagnosis, Chest X ray, identification of bacilli, and the histopathological detection of granulomatous lesions in addition to clinical findings generally lead to true diagnosis. The diagnosis of PTB and EPTB is even harder when smears and cultures are negative. Extra pulmonary tuberculosis (EPTB) is a growing problem worldwide [1-3]. Due to the nature of the disease, the diversity of clinical pictures as well as its minor epidemiological importance, the diagnosis is difficult and often late. Definitive diagnosis of tuberculosis includes a demonstration of the presence of M. tuberculosis by microbiological culture and histopathological methods. Classical methods of TB diagnostics have significant limitations for diagnosis of EPTB. Culture is a lengthy process, while in these patients often requires rapid diagnosis. Material for PCR diagnosis is often not possible to obtain (except cerebrospinal fluid and urine), and histopathological diagnosis requires surgical procedure, which is an invasive technique. The most reliable diagnostic criteria, is still to confirm the presence of bacilli in the patient's material by culture. In some forms of EPTB, material can be taken for culture from renal, meningeal, pleural, and pericardial fluid. Pleural effusion is a common reason for admission in hospitals and tuberculosis is found most common infectious cause. Pleural tissue histopathology and culture for Mycobacterium tuberculosis is considered the gold standard but the procedure is invasive, requires skilled clinicians and does not provide immediate results [2, 4-9]. Advances in rapid diagnostic techniques are urgently required both for the early management of the new cases of TB and for the individuals already infected with Mycobacterium tuberculosis who are at risk of developing disease. In addition to standard TB diagnostic techniques, use of new biochemical (surrogate markers like ADA, LDH, gamma interferon) are increased. An immunological test depending on the measurement of levels of gamma-interferon, the QuantiFERON-TB gold (QFT-G), specific to M. tuberculosis antigen produced by T cells have been developed in recent years. It is somewhat faster and more reliable test for diagnosing latent and active tuberculosis. Since there is no single test to diagnose M. tuberculosis infection, invasive procedures are needed in such cases, and diagnosis is usually delayed [8, 10-23]. Therefore, to address these limitations, we evaluated adenosine deaminase (ADA) in serum and in other body fluids (pleural, pericardial, peritoneal, cerebrospinal & synovial fluid) and gamma interferon in serum to find out the combined efficacy of these two biochemical markers for rapid diagnosis of PTB and EPTB.

Objectives

To evaluate the diagnostic accuracy of serum ADA and gamma interferon for the diagnosis of PTB and EPTB.

Methods

This hospital based cross sectional study was conducted in National Institute of Diseases of the Chest and Hospital (NIDCH), Mohakhali, Dhaka-1212 at Pathology & Microbiology departments during the period of January 2013 to June 2013. This current article is produced freshly as a part analyzing only two biomarkers (ADA and gamma interferon) at present from the data of original study where some other biomarkers were included for analysis and evaluation. After getting the approval of the research proposal from the ethical committee of DGHS/BMRC, consent was received from each individual prior to inclusion. They were informed of their right to withdraw from the study at any stage. Assurance was given that the data shall be collected anonymously and the confidentiality concerning their information was maintained strictly. The research was conducted in full accord with ethical principles. From selected patients, after aseptic preparation 5 ml of whole venous blood from antecubital vein was collected in clean and dry test tube and was kept standing for clotting. Then it was centrifuged at 3000 rpm to separate serum. 5 ml of pleural, pericardial, peritoneal and synovial fluid of each was collected aseptically from the patients who had it and was kept in a clean dry test tube. Three samples of adequate amount of sputum were collected in a dry clean plastic cup from all the patients. The subjects were patients from OPD and indoor of Institute of Diseases of the Chest and Hospital (NIDCH), who were clinically suspected TB patients, hospitalized for investigation for fever of unknown origin. Adenosine deaminase levels were measured during diagnosis of fever of unknown origin (FUO). In addition to standard examinations, X- ray of the lungs, USG of abdomen, haematological and biochemical tests, abdomen, chest or pelvic CT scan, echocardiography was done depending on the presentation of illness. The histological processing of tissues of clinical interest (biopsy of the liver, peritoneum, small bowel and adnexa) were also conducted. Histological processing of tissue samples were performed at the Pathology department of this institute. The level of adenosine deaminase (ADA) was determined by enzymatic method from blood samples collected. Gamma interferon (using QFT-G) also was done in blood samples as per direction of the manufacturer. After collection, all the data was checked and edited. Then data was entered into computer with the help of software SPSS for windows programmed version 12. After frequency run, data was cleaned and frequencies were checked. An analysis plan was developed keeping in view with the objectives of the study (CI 95%, $p<0.05$). Due to the heterogeneity of data, although the observed parameters were continuous, we used nonparametric tests ($\chi2$ test). Sensitivity and specificity of test results were calculated.

Results

For this study 208 clinically suspected tuberculosis (pulmonary and extra-pulmonary) patients were enrolled. Among them 131 patients (male 98, female 33) were proved positive by any one or in combination of sputum smear (Z-N or Auramine stain), sputum or tissue culture and histopathological examination. Age of the study subjects is ranging minimum 20 years to maximum 90 years (mean ± SD, 44.65±17.84). Mean ± SD of male and female is 44.66±17.94 & 44.61±17.77 respectively and was statistically insignificant.

Male and female distribution is shown in Figure-1 and sex found statistically insignificant.

Figure 1: Sex distribution of the study subjects.
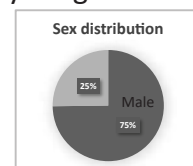
Table 1: Demographic Profile of the study Subjects

		Male n (%) 98 (74.8)	Female n (%) 33 (25.2)
*Income	Low	59 (60.2)	23 (69.7)
	Medium	31 (31.6)	10 (30.3)
	High	8 (8.2)	0 (0)
Education	Primary	68 (69.4)	24 (72.7)
	SSC	22 (22.4)	7 (21.2)
	HSC	5 (5.1)	2 (6.1)
	Above	3 (3.1)	0 (0)
Smoking Habit	Smoker	87 (88.8)	4 (12.1)
	Non-smoker	11 (11.2)	29 (87.7)
Residence	Kacha	57 (58.2)	24 (72.7)
	Semi-pacca	38 (38.7)	9 (27.3)
	Pacca	2 (3.1)	0 (0)

*Income (BDT/month): Low < 10,000/-; Medium > 10,000/- to < 30,000/-; High > 30,000/-.

Demographic Profile of the study subjects are shown in Table-1. High frequency was found in low income, low education, smokers and dwellers of kacha residence among both male and female.

Eighty nine (67.9%) of total and 66(67.3%) & 23(69.7%) of male & female patients respectively have pulmonary TB. Rests have extra-pulmonary TB. No significant difference about both types of diseases found between male and female (Figure-2 & Table-2).

Table 2: Distribution of study subjects according to disease conditions

	PTB	EPTB	Total
Male n (%)	66 (67.3)	23 (69.7)	89 (69.7)
Female n (%)	32 (31.6)	10 (30.3)	42 (32.1)
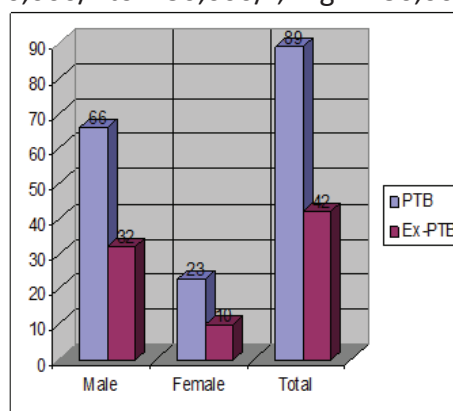
Figure: 2 Disease distribution of the study subjects.

Figure-3 shows the frequency distribution with percentage of samples. The most available sample is pleural effusion (54.2%) follwed by synovial, asceitic, cerebrospinal and pericardial fluid. 36.6% patients did not have any type of effusion.

Table 3: Results of Biochemical markers in Pulmonary TB & Extra-Pulmonary TB

	Pulmonary TB (n=89)	Extra-Pulmonary TB (n=42)	Total (n=131)
S. QFT-G			
Positive	73 (82.0)	33 (78.6)	106 (80.9)
Negative	16 (18.0)	09 (21.4)	25 (19.1)
S. ADA			
Positive	70 (78.7)	31 (73.8)	101 (77.1)
Negative	19 (21.3)	11 (26.2)	30 (22.9)
All			
Positive	88 (98.9)	40 (95.2)	128 (97.7)
Negative	1 (1.1)	02 (04.8)	03 (02.3)

Table 4: SEN, SPE, PPV, NPV & Accuracy of the Biochemical markers

Biochemical Marker	Pumonary TB					Extra-pumonary TB				
	SEN	SPE	PPV	NPV	ACC	SEN	SPE	PPV	NPV	ACC
S. ADA	92.7	90.03	92.8	90.06	82.02	94.39	92.46	89.8	95.42	78.57
S. γ-Interferon (QFT-G)	93.01	91.64	93.73	91.18	74.16	94.88	93.65	90.04	95.82	71.43
All	100	50	98.86	100	98.87	100	50	95	100	97.71

All results are in %

SEN (Sensitivity), SPE (Specificity), PPV (Positive predictive value),
NPV (Negative predictive value), ACC (Accuracy)
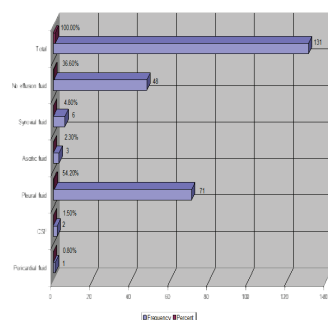
Fig: 3 Frequencies of samples

Table-3 shows the results of individual serum QuantiFeronTB-Gold (QFT-G), serum adenosine deaminase (ADA) and combined result of all the three biomarkers. When combined, the biomarkers show a high number of positive results, 128 (97.7%) out of 131.

Sensitivity, specificity, positive predictive value, negative predictive value and accuracy

of serum QuantiFeronTB-Gold (QFT-G), serum adenosine deaminase (ADA) and those of combined result of all the three biomarkers have been shown in Table-4. Each biomarker individually and all in combination showed good sensitivity and specificity.

Discussion

A hospital based cross sectional study was conducted enrolling 208 clinically suspected tuberculosis (pulmonary and extra-pulmonary) patients of 18-90 years of age, among them 131 patients were proved positive by any one or in combination of sputum smear (Z-N or Auramine stain), sputum or tissue culture and histopathological examination. In our study, like other several previous studies, demographic profile of the diseased persons and the prevalence of the disease in male and female were consistent with those studies.

Definitive diagnosis of tuberculosis includes a demonstration of the presence of M. tuberculosis by microbiological, cytological or histopathological methods. But, classical methods of TB diagnostics have significant limitations for diagnosis of EPTB. Cultivation is to long, while in these patients often requires rapid diagnosis. Material for PCR diagnosis is often not possible to take and histopathological confirmation requires biopsies, which are invasive. The most reliable diagnostic criteria, is still confirm the presence of bacilli in the patient material by cultivation [9, 10, 24]. In some forms of EPTB material can be taken for culture but, unfortunately, successful culture is very variable. Because of these problems in exact diagnosis of tuberculosis numerous additional tests are in use with the intention to facilitate the diagnosis. In the recent use, biochemical markers for tuberculosis infection, such as levels of adenosine deaminase concentration (ADA), level of serum LDH or the level

of interferon gamma was proved as of great importance. Piras et al were first to report high ADA in tubercular pleural effusion [25-29]. Meta-analysis of studies conducted between 1966 and 1999 concluded that the test performance was reasonably good [24, 30] (sensitivity range 47.1 - 100%, and specificity 0 - 100%) in diagnosing tuberculosis etiology in pleural effusion. Other researchers have also observed the usefulness of ADA activity in the diagnosis of tuberculosis disease [25, 31-38]. The article reviews of Gupta BK et al. ADA estimation as an effective diagnostic criterion for tuberculous and non-tuberculous disease in pleural, ascitic, synovial fluids and CSF [39-43]. In extra-pulmonary disease, overall sensitivity and specificity in the study was found to be high. It is evident that determination of this enzyme was reliable and useful test for the detection of tuberculosis infection in serous spaces (pleural, peritoneal, synovial space, cerebrospinal fluid) [8, 36, 44]. Srinivasa et al. found elevated serum adenosine deaminase levels in patients with pulmonary tuberculosis 30, 45-48]. In our sample the average value of its concentration was elevated. It was also supported by Stevanovic et al. [49-52]. Similar data were presented by Mishra and colleagues in children, where in addition to lung tuberculosis they had patients with miliary and extrapulmonary localization [31, 35-39].

Some studies were done to assess the usefulness of gamma interferon tests for diagnosis and management of immunocompromised individuals, in children and in those with extrapulmonary TB [39-51]. Our study also demonstrated the strong evidence of QFT-G to diagnose both PTB and EPTB.

Performance test of each biomarker was done to see the SEN, SPE, PPV and NPV to evaluate the efficacy of the biomarkers.

Conclusions

The diagnostic accuracy of ADA and gamma interferon may be low when singly done but when they are used in combination, it is significantly high.

Recommendations

Biochemical tests mentioned above may be useful adjunct tests for diagnosing TB and EPTB for early and appropriate management to reduce morbidity and mortality. Larger studies are needed in our country to determine accurately the diagnostic value.

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Original Article

Relationship of Chest Pain with Changes in Rate Pressure Product and ST Segment after Sub Arachnoid Block in Caesarean Section

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ABSTRACT

Background: Transient electrocardiographic changes can be observed in healthy women undergoing caesarean section (CS) under sub arachnoid block. Chest symptoms and ECG changes consistent with myocardial ischemia are observed during elective cesarean section under sub arachnoid block. There is an association between administration of oxytocin and ECG changes among 50% of the women and the symptoms are short lived and usually subside without treatment. **Objective:** To assess the relationship between chest pain and changes in Rate Pressure Product (RPP) and ST Segment in patients undergoing elective caesarean section under subarachnoid block. **Methods:** This prospective observational study was carried out among 173 healthy women aged 20-35 years requiring elective cesarean section under single shot sub arachnoid block attended in the department of Anesthesiology of Satkhira Medical College Hospital, Satkhira, Bangladesh, From July, 2020 to December, 2020. Study subjects were divided on the basis of having chest pain. Changes in RPP and ST Segment were observed between the groups. **Results:** Majority of the patients had chest pain (84.3%). ST segment change 5 minutes after operation in chest pain group and no chest pain group was 1.96 ± 1.01 mm and 0.75 ± 0.44 mm respectively. RPP change 5 minutes after operation in chest pain group and no chest pain group was 11660.6 ± 2016.1 per minute and 8917.7 ± 399 per minute respectively. The changes came to normal level without any intervention after the operation. **Conclusion:** Changes in ST segment and RPP increases in chest symptom. So it can be say that, there is a substantial relationship of chest pain with changes in ST Segment and RPP in caesarean section.

Keywords: ST Segment change, Rate Pressure Product (RPP), Caesarean Section, Sub Arachnoid Block

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Introduction

Subarachnoid block for caesarean section is one of the most common regional block in the world. Immediate complication of sub arachnoid block are: bradycardia, hypotension and shortness of breath [1]. Transient electrocardiographic changes, such as ST segment depression and T wave abnormalities are observed in 25-60% women undergoing caesarean section under sub arachroid block [2]. The majority of the studies have reported after delivery of the baby. This time epoch marks the period of highest hemodynamic stress to maternal heart. Rise in preload occurs due to feto-maternal auto transfusion. Use of oxytocic drugs and venous air emboli can occur at in time [3].

They all collectively can lead to transient electrocardiographic changes and symptoms similar to myocardial ischemia. Some studies reported that tachycardia was a significant variable associated with ST segment changes. Significant association was found between

electrocardiographic changes and oxytocin administration [4, 5]. Oxytocin is a vasoactive peptide that is routinely given after delivery to initiate and maintain uterine contraction after placental delivery to prevent excessive bleeding oxytocin receptor are located in uterus, heart and large vessels [6]. It has powerful vaso-constrictive effect on umbilical, uterine, and coronary vessels. Due to direct relaxing effect on systemic vasculature it reduces systemic vascular resistance that leads to hypotension and reflex tachycardia [7]. The combination of hypotension, tachycardia, and coronary vasoconstriction can cause mismatch between oxygen supply and demand leading to myocardial ischemia even without coexisting coronary artery disease [8].

Cardiovascular changes increased myocardial oxygen demand speculated that increased demand of oxygen by myocardium in pregnant patients along with acute hypervolemia due to intravenous fluid preload plus auto-transfusion from uterus results in increased end-diastolic volume (pressure) with consequent excessive oxygen demand of myocardium [9]. Concurrently sympathetic block induced reduction in diastolic pressure and decreased coronary perfusion impairs myocardial oxygen supply.

Rate pressure product is very reliable indicator of myocardial oxygen demand and ventricular function. Rate pressure product is defined by heart rate multiplied by systolic blood pressure. It has been suggested that rate pressure product should be maintained below 10000 [10]. The etiology of ST segment changes in parturient may also associated with anxiety states, vago-regulatory asthenia (hyper-dynamic heart syndrome, mitral valve prolapsed or autonomic system imbalance [3].
At cesarean delivery the acute hypervolemia induced by pre-hydration and auto-transfusion

from the uterus in the presence of sympathetic block, place excessive demands on the myocardium causing transient increases in left ventricular end-diastolic volume (and pressure), thereby increasing myocardial oxygen demand. Concurrently, a sympathectomy-induced decrease in diastolic arterial pressure decreases coronary perfusion pressure and impairs myocardial oxygen supply. There is imbalance between demand and supply lead to reflex tachycardia and subsequently increase rate pressure product to supply more oxygen to myocardium. Rate pressure product is very reliable indicator of myocardial oxygen demand and ventricular function.

The similarity of chest symptoms to myocardial ischemia prompted us to undertake this study. On healthy women undergoing elective cesarean section under sub arachnoid block. The aim was to determine the ST segment and Rate pressure product changes associated with chest pain after sub arachnoid block in caesarean section.

Materials and Methods
This prospective observational study was carried out among 173 healthy pregnant women who underwent elective cesarean section under single shot sub arachnoid block in the department of Anesthesiology of Satkhira Medical College Hospital, Satkhira, Bangladesh, during July 2020 to December 2020. Patient underwent elective caesarean section, normal single pregnancy beyond 36 weeks gestation, age belonged to 20 - 35 years were enrolled in this study. Age below 20 years, more than 35 years, emergency caesarean section, hypertension, valvular heart disease, pregnancy induce hypertension, gestational diabetes, eclampsia, jaundice, history of asthma, multiple pregnancy and refuse to subarachnoid block were excluded from the study. All the patients/legal guardians of partic

ipants were properly explained about the objectives of the study along with its procedure, risk and benefits to be derived from the study in easily understandable local language and then informed consent was taken from them. It was assured that all records would be kept confidential and would not be disclosed anyway except for the purpose of study. It was assured that the procedure was helpful for both the physician and patients in making rational approach regarding management of the case. After taking history and clinical examination all the patients were having standard monitoring like ECG, NIBP (Non-Invasive Blood Pressure), pulse oximetry. All findings were collected in a pre-designed data collection sheet.

Study Procedure

Intravenous line with 18G IV cannula was secured. Injection Omeprazol 40 mg IV and metoclopramide 10 mg IV as a premedication was given. Baseline electrocardiography, NIBP and heart rate was recorded. With the patients in sitting position lumbar area was prepared aseptically and draped. Ringer's lactate at the rate of 15 ml/kg body weight was started as prophylactic intravenous fluid preload. The prick point was infiltrated with 2ml of 1% lignocaine. Once free flow of cerebrospinal fluid was obtained, 10mg 0.5% hyperbaric Bupivacaine (2ml) plus 12.5 µg fentanyl (0.25ml) administered very slowly at the level of L3-L4 with 25 gauge Quincke needle. Immediately after subarachnoid block patients was placed in supine position with wedge under right buttock. Surgery was allowed after adequate block. Oxygen was administered by Hudson mask at the rate of 4 L/min until delivery. Just after delivery of fetus 5 unites of Oxytocin was given IV slowly. Blood pressure were recorded every 2 minutes for first 20 min then every 15 minutes until end of surgery. Hypotension (systolic Blood pressure ≤90 mm Hg) was man

aged by increasing rate of intravenous infusion and ephedrine. Heart rate and SpO2 was monitored continuously. Bradycardia (heart rate <50 bpm) was treated with atropine. Electrocardiography (lead II and V5) was monitored continuously until end of surgery. ST segment depression of 1 mm and elevation of 2 mm for at least 1 minute duration was considered significant. Intra-operative electrocardiography was compared with baseline tracing. Rate pressure product variables, timing of chest pain, timing and duration of ST segment changes, and all obstetric events were noted. Rate pressure product more than 10000 was considered significant and it is compared with baseline [10].

Results

We divided our patients on the basis of having chest pain which is shown in table 1. Majority (84.3%) of our patients had chest pain. Per-operative changes in ST segment and Rate Pressure Product (RPP) is shown in table 2 that shows majority had highest changes 10 minutes after operation. Table 3 and 4 shows the changes in ST segment (mm) and RPP (per minute) in groups which indicates the increase in ST Segment and RPP in patients with chest pain.

Table 1: Distribution of the patients on the basis of symptom (chest pain)

Symptom	Frequency n (%)
Chest pain	146 (84.3)
No chest pain	27 (15.7)
Total	173 (100)

DISCUSSION

This prospective observational study was conducted at in the department of Anesthesiology of Satkhira Medical College Hospital, Satkhira, Bangladesh, From July 2021 to December 2021 to evaluate the ST segment and rate pressure product changes with chest

pain in patients with elective caesarean section under subarachnoid block. We divided our patients on the basis of having chest pain in to chest pain group and no chest pain group. Any change in ST segment and RPP was observed in these groups.

Table 2: Per-operative change in ST segment and Rate Pressure Product (RPP)

Time	ST segment change (mm) Mean ± SD	RPP change (per minute) Mean ± SD
Beginning of operation	1.25 ± 1.21	10101.89 ± 1109.9
5 minutes after operation	1.96 ± 1.01	11092 ± 2163.4
10 minutes after operation	2.12 ± 1.11	11245 ± 2107.6
At the end of operation	0.21 ± 0.11	8980.7 ± 806.4

Table 3: Change in ST segment (mm) in Groups

ST Segment Change	Chest Pain Group	No Chest Pain Group
Beginning of operation	1.25 ± 1.21	1 ± 0.45
5 minutes after operation	1.96 ± 1.01	0.75 ± 0.44
10 minutes after operation	2.12 ± 1.11	0.55 ± 0.41

In the present study majority (84.3%) of our patients had chest pain. This is a common phenomenon in patients undergoing operation. In their study Srivastava U et al. (2015)

Table 4: Change in Mean Rate Pressure Product (per minute) in Groups

Mean Rate Pressure Product Change	Chest Pain Group	No Chest Pain Group
Beginning of operation	10404.1 ± 913.2	8404.9 ±216
5 minutes after operation	11660.6 ± 2016.1	8917.7 ± 399
10 minutes after operation	11428.3 ± 2179.8	9203.1 ± 299.9

also found the same findings. Several other studies stated that the subjective symptoms, such as chest pain and chocking were also described where micro air emboli, pain from retroperitoneal traction, cardiac sympathetic block are some of suggested explanations [11, 12].

In the current study, ST segment change 5 minutes after operation in chest pain group and no chest pain group was 1.96 ± 1.01 mm and 0.75 ± 0.44 mm respectively (table 3) and RPP change 5 minutes after operation in chest pain group and no chest pain group was 11660.6 ± 2016.1 per minute and 8917.7 ± 399 per minute respectively (table 4). The changes came to normal level without any intervention after the operation. Bhattacharya et al. [13] stated that three patients had ST-T changes and 5 patients had chest pain in bolus group. No such adverse events were observed in the infusion group. In their study Teli et al. [14] reported that the Rate Pressure Product (RPP) is a valuable marker of cardiac function. Rate pressure product is the product of heart rate (HR) and systolic blood pressure (SBP) (HR x SBP/1000). RPP up to 12 at rest and up to 22 in stressed conditions is considered as normal [10]. RPP is not only an index of O_2 consump

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Conclusion
Changes in ST segment and RPP increases in chest symptom. So it can be say that, there is a substantial relationship of chest pain with changes in ST Segment and RPP in caesarean section.

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Original Article

Association of Comorbidity
with Severity of COVID-19 Patients of Bangladesh

**Hasin Akhter Jahan¹, Fareeda Tabassum², Nadia Nasrin³, Shaikh Nazmus Saqueeb⁴,
Mohammad Maniruzzaman⁵, Md. Abdul Alim⁶, Manosh Kumar Mondal⁷, Md. Mehedi Hasan⁸**

ABSTRACT

Introduction: COVID-19 has been declared as a global pandemic officially on March 11, 2020 by World Health Organization. Since then, it has become a great challenge to health-care systems. Studies have evaluated that, risk factors such as age, sex, chronic lung disease (e.g., COPD, chronic asthma), cardiovascular disease (e.g., heart failure, old MI, ASD, VSD), diabetes mellitus, hypertension, dyslipidemia may be related to COVID-19 complications. **Aims and objectives:** The aim of the study was to observe the frequency of comorbidities and the pattern of severity of disease presentation by COVID-19 positive patients and to explore whether the presence of these comorbidities increase the COVID patients' risk. **Materials and methods:** It was a cross-sectional analytical study that was performed in the departments of Biochemistry of Sir Salimullah Medical College, Dhaka, Bangladesh and Satkhira Medical College, Satkhira, Bangladesh during the periods of July 2020 and December 2020. A total of 500 COVID-19 RT-PCR positive patients was included in this study. The clinical syndrome of COVID -19 was divided as mild, moderate, severe and critical case according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh. Association of comorbidity with severity of COVID-19 was searched in this study. **Results:** Disease severity (clinical classification) of COVID-19 patients was associated with comorbid disease like liver disease, renal disease, coronary lung disease, malignancy, diabetes mellitus and hypertension with a *p* value of <0.001. **Conclusion:** Comorbid conditions like liver disease, renal disease, coronary lung disease, malignancy, diabetes mellitus and hypertension is associated with severity of COVID-19.

Keywords: Comorbidity, COVID-19

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Introduction

World Health Organization declared COVID-19 a global pandemic officially on March 11, 2020. COVID-19 caused by SARS-CoV-2 represents a great challenge to health-care systems as it is a rapid spreading and highly fatal disease [1]. After a rapid spread in China, new outbreaks occurred in Italy and in several European countries, followed by a spread to many countries in the world. The disease is primarily transmitted through large respiratory droplets and represents from asymptomatic or mild infection to severe form of disease [2]. Studies have shown that the clinical feature of

COVID-19 may vary from fever, dry cough, dyspnea, and fatigue in mild cases to viral pneumonia and severe acute respiratory distress syndrome (ARDS) in more severe cases. It may even cause death [3]. As there is no specific treatment found to be effective for COVID yet, the management protocol of COVID is identified as early detection and symptomatic management. For this purpose, the clinical syndrome of COVID -19 is divided as mild, moderate, severe and critical case according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh (DGHS, 2020).

Many studies have evaluated risk factors such as age, sex, chronic lung disease (e.g., COPD, chronic asthma), cardiovascular disease (e.g., heart failure, old MI, ASD, VSD), diabetes mellitus, hypertension may be related to COVID-19 complications. Studies have shown that, elderly males and person with cardiovascular diseases are more prone to adverse COVID-19 outcomes. In severe patients with COVID-19, respiratory failure can occur within a short time, even leading to death. Early data from Wuhan Hospital showed that 61.1% of patients in ICU had respiratory failure, 44.4% had arrhythmia, and 30.6% had a shock [4]. In addition, obesity is a major risk factor for many non-communicable disease and recent studies found that obesity associated risk factors is related with severe COVID-19 outcomes [5, 6].

In 2009, a significant percentage of hospital admission and mortality because of H1N1 Influenza, a virus infection was due to obesity. There might be a similar effect with novel COVID-19 infection. The Centers for Disease Control and Prevention has listed severe obesity at any age (body mass index [BMI] ≥40 kg/m2) as a high-risk condition for COVID-19. Social determinants of health, such as race/ethnicity, income level and education have been shown to be risk factors for COVID-19 [7].

Obesity and diabetes are established comorbidities for COVID-19. Adipose tissue shows high expression of ACE2 and with the help of this SARS- CoV-2 enters host cells. This makes adipose tissue a reservoir for SARS-CoV-2 viruses. The level of expression of ACE2 in adipose tissue is reported to be higher than in lung tissue. The expression of ACE2 receptors is the same for adipose tissue in obese and non-obese patients but the difference is in the mass of the adipose tissues that made patients with obesity more susceptible to the complications of COVID [8]. ACE2 on adipocytes have systemic effects on the cardiovascular system and there is an interaction between gender, adipocyte ACE2 and complications of obesity, e.g., hypertension [9].

Obesity is correlated with increased risk for pro-inflammatory and pro-thrombotic states as well as poor lung mechanics which are considered as poor prognostic factors in severe illness in COVID-19 outcomes. Among obese COVID patients, immunological and inflammatory alteration may enhance by excess mass of adipocytes as pro-inflammatory cascades are stimulated by increased mass of adipose tissue. Adipocytes in healthy adipose tissue are insulin-sensitive and nearly all immune cells such as resident macrophages, mast cells, monocytes, natural killer cells, B cells, T cells, neutrophils, and eosinophils have been found in adipose tissue. Obesity changes the composition, structure, and function of adipose tissue [10].

Due to excess intake of calorie, adipose tissue undergoes expansion. Expansion of adipocytes and inadequate vascularization lead to hypoxia, adipocyte apoptosis/ necrosis and enhanced secretion of inflammatory adipokines such as cytokines, and chemokines. This causes a massive immune cell infiltration

that further promotes inflammation [11].

The severe manifestation of COVID-19 is characterized by an uncontrolled excessive production of soluble inflammatory cytokines. This cytokine storm is characterized by highly increased levels of IL-6, TNF-α, IL-2, and IL-7 in patient blood [12].

The aim of the study was to observe the frequency of comorbidities and the pattern of severity of disease presentation by COVID-19 positive patients and to explore whether the presence of these comorbidities increase the COVID patients' risk. Moreover, to the best of our knowledge, no such study was reported to be done in our country. So, this study is designed to evaluate the association of comorbidity with severity of COVID-19 Patients of Bangladesh.

Materials and methods

It was a cross-sectional analytical study that was performed in the departments of Biochemistry of Sir Salimullah Medical College, Dhaka, Bangladesh and Satkhira Medical College, Satkhira, Bangladesh during the periods of July 2020 and December 2020. A total of 500 COVID-19 RT-PCR positive patients was included in this study. The clinical syndrome of COVID -19 was divided as mild, moderate, severe and critical case according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh. Association of comorbidity with severity of COVID-19 was searched in this study. Our research question was whether comorbid diseases were associated with severity of COVID-19. We regarded the comorbid conditions like liver disease, renal disease, coronary artery disease, chronic lung disease, malignancy, diabetes mellitus, hypertension, thyroid disease, dyslipidemia, obesity,

smoking and chronic alcohol consumption as comorbid condition.

Purposive convenient sampling was done. Sign symptoms of the subjects were defined as mild, moderate, severe and critical.

• Mild symptoms are addressed as fever, fatigue, cough (with or without sputum production), sore throat, nasal congestion, anorexia, malaise, or headache, diarrhea, nausea, and vomiting.

• Moderate symptom as pneumonia but no signs of severe pneumonia.

• Severe symptom as severe pneumonia presented as fever or suspected respiratory infection plus Respiratory rate > 30 breaths/minor severe respiratory distress or sepsis.

• Critical as presence of ARDS or septic shock.

Inclusion criteria:

COVID-19 positive patient with age between 30 to 59 years and both sexes.

Exclusion criteria:

Participants with a known case of
• Genetic diseases.
• Psychiatric disorders.
• Hematological disorders

Results

Distribution of the study subjects on the basis of comorbid conditions are shown in table 1. Figure 1 shows the bar diagram of the distribution of the study subjects. Table 2 shows the distribution of study subjects by clinical classification. Association of co-morbid disease with disease severity is shown in table 3 which shows significant association of co-morbid conditions like Liver disease, renal disease, coronary lung disease, malignancy, diabetes mellitus and hypertension with severity of COVID-19.

Table 1: Distribution of the study subjects by comorbid disease (n=500)

Comorbid disease	Frequency n (%)
Liver disease	60 (12)
Renal disease	138 (27.6)
Coronary artery disease	132 (26.4)
Chronic lung disease	101.(20.2)
Malignancy	10 (2)
Diabetes mellitus	287 (57.4)
Hypertension	237 (47.4)
Thyroid disease	30 (6)
Dyslipidemia	43 (8.6)
Obesity	39 (7.8)
Smoking	135 (27)
Chronic alcohol consumption	3 (0.6)

Table 2: Distribution of the study subjects by clinical classification (n=500)

Clinical classification	Frequency n (%)
Mild	154 (30.8)
Moderate	229 (45.8)
Severe	108 (21.6)
Critical	9 (1.8)
Total	500 (100)
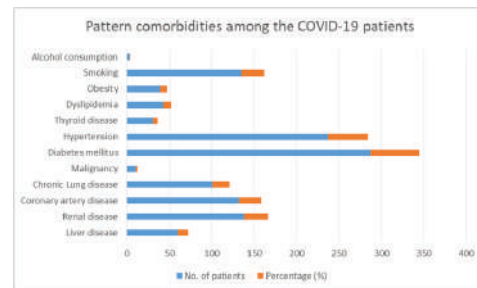
Figure 1: Bar diagram showing the pattern comorbidities among the COVID-19 patients.

Table 3: Association of co-morbid disease with disease severity (clinical classification) of COVID-19 patients (n=500)

Comorbid disease	Clinical classification				p value
	Mild n = 154	**Moderate** n = 229	**Severe** n = 108	**Critical** n = 9	
Liver disease	18 (11.7%)	12 (5.2%)	28 (25.9%)	2 (22.2%)	<0.001*
Renal disease	38 (24.7%)	52 (22.7%)	48 (44.4%)	0 (0.0%)	<0.001*
Coronary artery disease	30 (19.5%)	51 (22.3%)	48 (44.4%)	3 (33.3%)	<0.001*
Chronic lung disease	26 (16.9%)	53 (23.1%)	22 (20.4%)	0 (0.0%)	0.207
Malignancy	10 (6.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	<0.001*
Diabetes mellitus	74 (48.1%)	135 (59.0%)	71 (65.7%)	7 (77.8%)	0.016
Hypertension	54 (35.1%)	113 (49.3%)	65 (60.2%)	5 (55.6%)	0.001*
Thyroid disease	4 (2.6%)	17 (7.4%)	9 (8.3%)	0 (0.0%)	0.133

p value reached from Chi-square test, *significant

Discussion

COVID-19 infection is not controlled so far. So, control of comorbidity is one of the main aim to lead a better life and keep ourselves away from the highly contagious disease. So, the aim of the study was to observe the frequency of comorbidities and the pattern of severity of disease presentation by COVID-19 positive patients and to explore whether the presence of these comorbidities increase the COVID patients' risk. So, we have done a cross-sectional analytical study that was performed in the departments of Biochemistry of Sir Salim-ullah Medical College, Dhaka, Bangladesh and Satkhira Medical College, Satkhira, Bangladesh during the periods of July 2020 and December

2020. A total of 500 COVID-19 RT-PCR positive patients was included in this study. The clinical syndrome of COVID -19 was divided as mild, moderate, severe and critical case according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh. Association of comorbidity with severity of COVID-19 was searched in this study.

We found 57.4% of our study subjects with diabetes mellitus (table 1). In a meta-analysis Kumar et al. also found strong association of diabetes with COVID 19 with a pooled odds ratio of 1.90 (95% CI: 1.37-2.64; p < 0.01) [13]. Next to diabetes mellitus our 47% study subjects had hypertension.

We had most of our patients with moderately ill with COVID-19. Similar results were found in the studies of Bello-Chavolla OY et al. (2020) and Muscogiuri G et al. (2020). We tried to divide our study subjects as mild, moderate, severe and critical according to National Guidelines on Clinical Management of Coronavirus Disease 2019 of Bangladesh. We found the association of liver disease, renal disease, coronary artery disease, malignancy, diabetes mellitus and hypertension with severity of COVID-19 with a p value of <0.001 which was obtained by chi squared test (table 3). All these diseases are linked together at some point with obesity. In their study, Bello-Chavolla OY. et al. (2020) found risk factors for lethality in COVID-19 with early-onset diabetes, obesity, chronic obstructive pulmonary disease, advanced age, hypertension, immunosuppression, and chronic kidney disease (CKD). They also observed that obesity mediates 49.5% of the effect of diabetes on COVID-19 lethality.

Though our study has a few limitations. It was conducted in a limited population. In addition, this study had no control group, and the findings may not be generalizable to other popula tions.

Conclusion

In conclusion, the findings of the present study suggest that, severity of COVID-19 is associated with liver disease, renal disease, coronary artery disease, malignancy, diabetes mellitus and hypertension.

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CONTENTS

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Original Article

Identification of Risk Factors for Polycystic Ovary Syndrome: a Case Control Study

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ABSTRACT

Background: Polycystic Ovary Syndrome (PCOS) is the most frequent endocrinopathy in women and usually presents at puberty. It is thought to be one of the leading cause of female infertility. Etiology of PCOS is still inconclusive due to its complexity. So risk factor identification is one of the major target to gynecologists. **Aims:** To find out the risk factors for polycystic ovary syndrome. **Methods:** This case-control study was carried out in the department of Obstetrics and Gynecology of Satkhira Medical College Hospital, Satkhira, Bangladesh, from January 2020 to December 2020. A total of 100 women with polycystic ovary syndrome (case) and rest 100 women of reproductive age group without polycystic ovary syndrome (control) were included in this study. **Result:** In search of independent risk factors of polycystic ovary syndrome, we found significant association of consumption of fruits ≤ 2 times/week with OR=1.60 (95% CI 1.12 - 8.28), BMI >25 kg/m2 with OR=1.68 (95% CI 1.56 - 10.79), family history of DM with OR=1.15 (95% CI 2.04 - 5.57) and intake of rich food 1 time/week OR=1.15 (95% CI 1.05-7.46) in multivariate analysis of. **Conclusion:** Certain risk factors like consumption of fruits ≤ 2 times/week, BMI >25 kg/m2, family history of diabetes mellitus and consumption of rich food ≥ 1 times/week were independently associated with polycystic ovary syndrome.

Keywords: Polycystic Ovarian Syndrome (PCOS), risk factors

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Introduction

Polycystic ovarian syndrome (PCOS), featuring problematic follicular development, is an endocrine system disorder that has life-long impact upon its patients. Prevalence of PCOS among women at reproductive age was reported to be 4%–20% [1]. The disease is characterized by oligomenorrhea or amenorrhea, unovulation, insulin resistance (IR), hyperandrogenemia and cysts on the ovaries [2] and deemed as one of the main cause of anovulatory infertility. It does a lot of harm to women's physical and mental health. Etiology of PCOS is still unknown and prevalence of this disease varies due to the differences in genetic traits and living environment of its victims.

Etiology of PCOS is still inconclusive due to its complexity. One study attributes its cause to the interaction between genetic and environment factors [3]. Due to the fact that PCOS patients share one significant clinical manifestation of hyperandrogenemia, male hormone has been widely acknowledged as a biomarker

for PCOS in recent years. Except for hyperandrogenemia, PCOS also involve obesity, insulin resistance and type 2 diabetes and all of these complications lead to the ovarian production of androgen. Some studies also suggested that adolescent obesity increases the probability of PCOS at a later stage of life and insulin resistance as well as ensuing hyperinsulinemia may directly or indirectly result in LH secretion that leads to hyperandrogenemia [4]. As it has been confirmed that, obesity is the main risk factor for type 2 diabetes, there is a hypothesis that obesity, insulin resistance as well as hyperandrogenism were all potential risk factors for PCOS.

The risk factors for PCOS includes irregular menstruation, family history of infertility and diabetes, mother's irregular menstruation, unpleasant mood, and lack of physical exercise. Most PCOS patients experience the onset of irregular menstruation since adolescence. Endocrine dyscrasia along any part of the hypothalamic-pituitary-gonadal axis may lead to irregular menstruation and anovulation [5]. It is also confirmed by study that PCOS is closely related to irregular menstruation. IR as an important contributor to PCOS and some studies reported that percentage of IR among PCOS patients was as high as 50%–70% [6]. Family history of diabetes, notably an inherited metabolic disorders, also poses significantly high risk for PCOS. This is consistent with the finding of Roe et al. (2013). Tian et al. (2014) [7] reported the odds ratio of mother's infertility OR was 8.599, which suggests the heredity of the PCOS disease. If the mother suffers from irregular menses, the daughter also suffer from the same and has high probability to suffer from PCOS. Both national and abroad psychology evaluation studies discovered severe mental or psychological disorder among PCOS patients, and it is inferred that unpleasant mood also increase the risk for PCOS.

Lack of physical exercise, leading to uneven distribution of body fat, is an important risk factor of centripetal obesity. One study advises proper diet and regular physical exercise to obese PCOS patients to achieve significant alleviation of symptoms like excessive hair and irregular menstruation and if combining medicine with kinesitherapy and individualized nutrition therapy within three months patients can also expect significant improvement in metabolism and internal secretion [8].

PCOS affects women in reproductive age group, and the age of onset is most often perimenarchal (before bone age reaches 16 year). However, clinical recognition of the syndrome may be delayed by failure of the patient to become concerned by irregular menses, hirsutism, or other symptoms or by the overlap of PCOS findings with normal physiologic maturation during the 2 years after menarche. In lean women with a genetic predisposition to PCOS, the syndrome may be unmasked when they subsequently gain weight [2].

It is believed to have a genetic component to PCOS and increased chance of familial clustering of disease. Long working hours, poor eating habits, stress and consumption of high fat animals which produce high arachidonic acid may contribute to this disease [10]. The current study aims to identify the risk factors of Polycystic Ovary Syndrome.

Materials and Methods

This case control study was done in 200 patients, in the Obstetrics and Gynecology Department, Satkhira Medical College Hospital, Satkhira, Bangladesh between the periods of January 2020 and December 2020. Out of them 100 patients with PCOS was considered as group I (case) and 100 patients without PCOS was considered as group II (control). Presence of hyperandrogenism, hirsutism,

acne, polycystic-appearing ovaries (by ultraso-nography), obesity, and acanthosis nigricans, presence of oligomenorrhoea or amenorrhoea and patient with history of infertility were enrolled in this study. Patients who received hormonal contraceptives or other drugs that could interfere with the hormone and meta-bolic studies, patients who suffered from chronic or acute disease such as genetic syndromes, coeliac disease, renal, liver, or cardiac disease, or undernourishment, preg-nant during the previous 6 months, use sex steroids, have abnormal thyroid function or prolactin levels, postmenopausal women and patient who refused to participate in the study were excludeddc from the study. The objec-tives of the study along with its procedure, risk and benefits to be derived from the study was explained to the patients in easily understand-able local language and then informed consent was sought from them. It was assured that all records would be kept confidential and would not be disclosed anyway except for the purpose of study. Proper history taking, clinical examination, were performed. All findings were collected in a pre-designed data collec-tion sheet.

Study Procedure

Patient attending OPD of Obstetrics and Gyne-cology in Satkhira Medical College Hospital, Satkhira, Bangladesh, as suspected case of Polycystic Ovary Syndrome (PCOS), were enrolled for the study. The patients were assessed, prepare and then informed consent was taken. All the reports were noted in the data collection sheet.

Statistical analysis

Statistical analysis was carried out by using the Statistical Package for Social Sciences version 22.0 for Windows (SPSS Inc., Chicago, Illinois, USA).

Results

We have taken details history of the suspected patients of PCOS for identification of risk factors of association of PCOS. We have predicted age, education, occupation, exercise, physical activity, body mass index (BMI), consumption of fruits, consumption of rich food, consumption of soft drink, consumption of fast food, consumption of vegetables, consumption of rice, and positive family histo-ry of diabetes mellitus, PCOS and infertility as risk factor for PCOS. After doing multivariate logistic regression analysis of risk factors asso-ciated with PCOS, independent risk factors of polycystic ovary syndrome were significantly associated with consumption of fruits   2 times/week with OR=1.60 (95% CI 1.12 - 8.28), BMI >25 kg/m2 with OR=1.68 (95% CI 1.56 - 10.79), family history of DM with OR=1.15 (95% CI 2.04 - 5.57) and intake of rich food   1 time/week OR=1.15 (95% CI 1.05-7.46). Other factors were not significantly associated with polycystic ovary syndrome.

Discussion

Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder mostly due to hormonal imbalance. There could be more than one predisposing factors that can contrib-ute for development of PCOS. If we can identi-fy, majority of predisposing factors by our study, careful monitoring and proper correc-tive steps may help in prevention of develop-ment of PCOS and its long term health conse-quences and adequate management of PCOS can be ensured. We have predicted age, educa-tion, occupation, exercise, physical activity, body mass index (BMI), consumption of fruits, consumption of rich food, consumption of soft drink, consumption of fast food, consumption of vegetables, consumption of rice, and posi-tive family history of diabetes mellitus, PCOS, infertility as risk factor for PCOS.

Table: Multivariate logistic regression analysis of risk factors associated with Polycystic Ovary Syndrome (n=200)

	SE	B	OR	95% CI for EXP (B)		p value
				Upper	Lower	
Fruits	0.47	0.18	1.60	1.12	8.28	0.010[s]
BMI	0.40	0.09	1.68	1.56	10.79	0.000[s]
FHO DM	1.9	0.68	1.15	2.04	5.57	0.005[s]
Rich Food	1.88	0.47	1.15	1.05	7.46	0.001[s]
Occupation	0.54	0.57	0.72	0.03	0.88	0.392
Age	0.01	0.26	1.01	0.87	1.18	0.882
Education	0.18	0.08	0.84	0.35	2.02	0.693
FHO PCOS	0.81	0.45	2.25	0.57	8.92	0.249
FHO Infertility	0.76	0.70	2.13	0.57	7.89	0.258
Physical Activity	-0.03	0.67	0.97	0.28	3.32	0.962
Exercise	0.89	0.67	2.45	0.65	9.19	0.185
Fast food (times/week)	-0.33	0.31	0.72	0.39	1.32	0.287
Soft Drinks (times/week)	-0.16	0.53	0.85	0.30	2.39	0.761
Vegetables (times/week)	-0.15	0.25	0.86	0.53	1.39	0.549
Rice (times/week)	-0.39	0.40	0.68	0.31	1.49	0.331

s=significant, *p* value reached from Chi-square test

PCOS is a problem with hormones that affects women during their childbearing year's ages 15 to 44 years. Between 2.2 and 26.7 percent of women in this age group have PCOS [11]. In another study Yang et al. (2018) found the age odds ratio had 1.04 with 95% C.I 0.927–1.168. Calzada et al. (2019) study showed the age was similar in both groups, women with PCOS having mean age 28±5 years and healthy controls was 30±6 years, which is similar with the present study.

This study observed that housewife and service holders with less physical activity had significantly higher rates of PCOS; this effect may be related to age, body weight etc. Simi-

larly, Shan et al. (2015) found employed patients were 86.7% in case group and 91.9% in control group. The difference were not statistically significant (p>0.05) between two groups.

In our study, patients with family history of PCOS had 2.5 times chance of having PCOS with 95.0% C.I (0.57 to 8.92) with a p value of 0.249 which is not statistically significant. Similarly, Begum et al. (2019) study observed that participants who had a positive family history of PCOS in PCOS group and non-PCOS group are 60.8% and 58.5% respectively. The presence of a genetic component to PCOS and familial clustering of reproductive and metabolic abnormalities results in increased risk of PCOS among first-degree relatives of PCOS patients [17]. The high risk factors of polycystic ovarian syndrome include family history of diabetes and family history of infertility obtained by Shan et al. (2015).

Thomson et al. (2011) and Hutchison et al. (2011) studies suggested that many of the pathophysiological symptoms of PCOS can be improved by regular participation in physical activity. Though in our study we did not found the association of physical activity with PCOS.

Rodrigues et al. (2015) study observed that women with PCOS had lower quality diet including, high intake of sodium, soft drink, refined grains, and low intake of vegetables, fruits, dairy and sea foods. Hosseini et al. (2017) study indicated that more intakes of whole grains, plant proteins, and sea foods, and fewer intakes of refined grains were associated with lower risk of PCOS.

In our study we found positive association of consumption of rich food ≥ 1 time/week with occurrence of PCOS with a p value of 0.001 (OR 1.15 and CI 1.05/7.46).

Hosseini et al. (2017) study reported that higher intake of whole grains was associated with 64.0% lower risk of PCOS. The importance of carbohydrate intake due to its effect on the hormonal and metabolic system has been suggested by Hosseini et al. (2017) study.

In this present study, it was observed that fast food ≥ 1 time per week had 0.72 times chance of having PCOS with 95.0% (C.I 0.39-1.32). Begum et al. (2019) study found that participants consuming fast food diet for more than 3 days per week have 1.7 times more risk to develop PCOS compared to those consume fast food diet for less than 3 days per week also this risk is statistically significant (p<0.05). Fast food usually contains high amounts of saturated fats and steroids frequent consumption of fast food and irregular eating habits leads to fluctuations in glucose levels, insulin resistance and increases hormonal imbalance such as hyperandrogenism adding to the risk for development of PCOS [15]. Legro et al. (2013) study emphasize weight loss strategies along with calorie restricted diet for better control of PCOS.

In this present study, it was observed that BMI belonged to >25 kg/m2 had 1.68 times chance of having PCOS with 95.0% C.I 1.56 to 10.79. Begum et al. (2019) study observed that obese participants are at 1.74 times more risk for development of PCOS compared to participants with normal BMI. This is probably because of aggregation of factors that is lack of physical exercise and unhealthy diet habits. Also it was observed that obesity augments the severity of hyperinsulinemia in women with PCOS. Yang et al. (2018)in their study showed that BMI odds ratio had 1.097 with 95% C.I 1.0–1.2 and odds ratio 1.307 with 95% C.I ad 1.1–1.6% respectively, which support with the present study. Baldani et al. (2015) mentioned in their study that PCOS women

tend to accumulate fat in the visceral abdominal region, which confers them a metabolic risk. Wanderley et al. (2018) reported that there was a significant association between both anthropometric factors BMI and waist circumference and all the insulin resistance diagnostic methods.

After doing multivariate logistic regression analysis of risk factors associated with PCOS, independent risk factors of polycystic ovary syndrome were significantly associated with consumption of fruits ≤ 2 times/week with OR=1.60 (95% CI 1.12 - 8.28), BMI >25 kg/m2 with OR=1.68 (95% CI 1.56 - 10.79), family history of DM with OR=1.15 (95% CI 2.04 - 5.57) and intake of rich food ≥ 1 time/week OR=1.15 (95% CI 1.05-7.46). Other factors were not significantly associated with polycystic ovary syndrome.

Conclusion

So, from the study it can be concluded that, consumption of fruits ≤ 2 times/week, BMI >25 kg/m2, positive family history of DM and intake of rich food ≥ 1 time/week can be regarded as risk factor for PCOS. Other factors were not significantly associated with polycystic ovary syndrome in our study though we cannot rule out their association due to our small sample size.

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Original Article

Comparative Study of Short Term Outcomes of Open versus Laparoscopic Repair of Para-Umbilical Hernia

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ABSTRACT

Introduction: Among the ventral hernia Para-Umbilical Hernia (PUH) is one of the most common surgical problems. The prosthetic repair has become the standard of practice for para-umbilical hernia management with better outcome. There is still debate going on regarding the optimal surgical approach. This study compared the short term outcomes following open versus laparoscopic mesh repair. **Aim:** To compare the early complications of open repair with laparoscopic repair of PUH. To compare the post-operative hospital stay of open repair with laparoscopic repair of PUH. **Methods:** This was a prospective comparative clinical study done from January 2016 to December 2020 at the department of surgery in Satkhira Medical College Hospital, Sadar hospital & different private hospitals & clinics at Satkhira. **Results:** Out of 80 patients with PUH, 40 received open meshplasty and 40 patients received laparoscopic meshplasty. Postoperative pain and length of hospital stay is significantly less in laparoscopic PUH repair. Postoperative complications like wound infection, seroma, and haematoma are relatively less in laparoscopic group though statistically not significant. **Conclusion:** Laparoscopic PUH repair has significantly better outcome in terms of postoperative pain and postoperative hospital stay.

Keywords: Para-umbilical hernia, open herniorrhaphy, laparoscopic herniorrhaphy.

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Introduction

Para-Umbilical Hernia (PUH) is one of the most common surgical problems with rise in the repair rate annually [1, 2]. Previously PUHs were repaired by tension-free suture technique. Due to high recurrence rate this procedure lost popularity [3]. A real change in view of PUH repair came with the introduction of meshplasty [4]. Nowadays meshplasty is the most commonly performed procedure for PUH [5].

An increased incidence of wound infection and wound-related complications in open mesh repair lead to continuing research into the optimal method of treatment of PUH which lead the surgeons to adopt laparoscopic approach. Conventionally, smaller PUH has been repaired by open suture technique such as MAYO repair and its modifications but with a high recurrence rate of more than 20% [6, 7]. The open repair using prosthetic mesh usually require adequate subcutaneous dissection, raising of flaps and drain insertion with increased incidence of wound complications such as infection [8].

The recent introduction of laparoscopic repair of ventral hernias is gaining popularity and is being practiced by many surgeons all over the world [9, 10]. There is an increasing evidence that laparoscopic repair of PUH is superior to open mesh repair regarding operative and postoperative complications, postoperative pain and overall morbidity and mortality [11]. Very few studies are available comparing the open versus laparoscopic para-umbilical mesh repair and most of these are retrospective [12–14].

The primary objective of the study was to compare the early complications of LHR and OHR with mesh of PUH. Secondary objectives were to compare the operative time and length of postoperative hospital stay.

Methods

This was a prospective clinical study done in the department of surgery in Satkhira Medical College Hospital, Sadar hospital & different private hospitals & clinics from January 2016 to January 2021. All the patients above 18 years who attended surgical outpatient department with PUH were enrolled in our study. Patients who underwent laparoscopic repair in any surgical unit formed the laparoscopic group whereas those who underwent open repair formed the open group. Exclusion criteria included 1) Patients with obstructed or strangulated PUH, 2) Patients with abdominal malignancies, 3) Patients with coagulopathy, severe cardiopulmonary disease, ascites and renal failure, 4) Patients who had PUH repair in combination with another major surgical operation such as laparoscopic cholecystectomy and inguinal hernia repair, 5) Patients with recurrent PUH. After the patient's consent to participate in the study, the surgeon collected the demographic data, clinical presentation, comorbidity and size of the defect, intraoperative complications, post- operative complications, post-operative pain, operating time and length of hospital stay.

Surgery in OHR group was done mostly under regional anaesthesia. In some cases, general anaesthesia was also given. All cases in LHR group were done under general anaesthesia. Antibiotic was prophylactically given before incision. Abdomen was prepared, painted and draped.

In OHR, the sac was identified and in anatomical repair, the defect was closed primarily with non-absorbable suture. In addition to closure of defect, an absorbable Light Weight Mesh of suitable size with a minimum of 3 cm overlap beyond the margin of the defect was placed and fixed by a series of "U" stitches through the mesh and anterior rectus sheath and skin closed over it. A suction drain of suitable size was placed subcutaneously depending upon the extent of dissection and size of a hernia.

In laparoscopic hernia repair, the contents reduced, the fascial edges of the hernia defect were identified and size of the defect estimated after reducing the intra-abdominal pressure. To these measurements, 6 cm was added in both the directions to provide overlap of fascial edges (minimal 3 cm) of the hernia by the mesh. A Prolene mesh of appropriate size was introduced into the abdomen through the 10 mm port. The circumference of the mesh was then tacked to the abdominal wall at approximately 1 cm intervals.

Patients were allowed to take oral meals postoperatively after recovering from anaesthesia. Patients were discharged when they were symptomatically better and advised to perform their routine daily activities. Post-operative pain and severity of pain was assessed daily during hospital stay using Visual Analogue pain Scale (VAS).

Local complications like wound infection, haematoma and seroma were assessed post-operatively. Seroma and haematoma formation were confirmed by ultrasound. Patients who developed seroma/ haematoma were managed conservatively without any intervention by oral antibiotic for five days to prevent any secondary infection.

Results

A total of 80 patients with para-umbilical hernia were included in the study of which 40 were taken as study group who underwent LHR (Laparoscopic Herniorrhaphy) and remaining 40 were taken as control group who underwent OHR (Open Herniorrhaphy) either by open meshplasty or anatomical repair. The two groups were similar in respective to patient's age, sex and size of the defect.

Table 1 shows the mean age, sex and hernia size in open and laparoscopic groups which was nearly similar between groups. Both the groups did not have any intraoperative complications. In the postoperative period in the LHR group, no patient developed wound haematoma and seroma (table 2).

Table 1: Age, sex and hernia size distribution in groups.

Variable	Open Herniorrhaphy n = 40	Laparoscopic Herniorrhaphy n = 40
Mean Age (years)	45	42
Sex (M/F)	28/12	25/15
Mean Hernia Size (cm)	3.1	3.2

In OHR group 4 out of 40 patients developed wound hematoma (10%) and 4 out of 40 patients developed seroma (10%). In LHR

Table 2: Intra and post-operative events between groups.

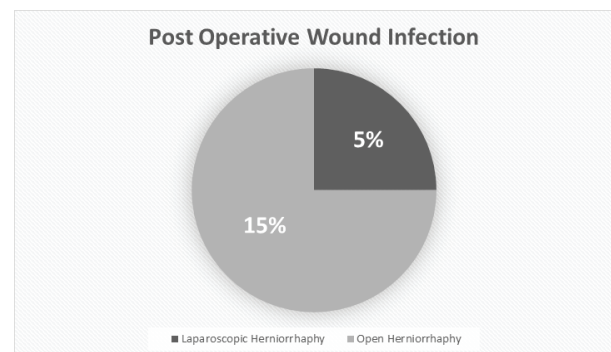| Variable	Open Herniorrhaphy n = 40	Laparoscopic Herniorrhaphy n = 40
Operating time (h:m)	1:10	1:20
Post-operative hematoma	4	0
Post-operative seroma	4	0
Post-operative infection	6	2
Post-operative pain	5	3
Hospital stay	5	3

Figure 1: Pie chart showing post-operative wound infection.

group only 2 patient out of 40 developed wound infection (5%) and in OHR group 6 out of 40 patients developed wound infection (15%).

Discussion

A para-umbilical hernia is a protrusion of a viscous or part of it through the linea alba abutting superiorly or inferiorly on the umbilicus. Most common presentation of PUH is swelling adjacent to umbilicus with the involvement of one of the walls of the umbili-

Diagnosis of PUH is mainly clinical. Some patients present with intestinal obstruction when bowel gets trapped in sac causing adhesions and irreducibility. In such cases imaging modalities like ultrasonography and abdomen radiography are helpful in knowing the contents of sac and severity of obstruction.

Surgery is the treatment of choice. In case of small defects (≤2-3 cms in diameter) primary anatomical repair can be done but in large defects (>2-3 cms in diameter) simple anatomical repair is associated with high recurrence rates. With the advent of mesh repair there was a drastic decline in recurrence rate. Prosthetic mesh can be placed as on-lay/overlay, inlay and underlay.

A recent meta-analysis of randomised controlled trials showed that laparoscopic repair significantly decreases the risk of wound complications like haematoma, seroma, and infection following ventral hernia repair [9]. Compared to open repair, laparoscopic repair is technically feasible, safe and effective with good clinical outcome. It is associated with relatively longer intraoperative time but reduced postoperative pain, analgesic requirement, complications and infection rates with early return to normal activities.

In open technique due to long incision, extensive dissection and raising of adequate flaps for mesh fixation postoperative pain is generally more when compared with laparoscopic repair.

Laparoscopic repair needs surgical expertise. Intraoperative time in laparoscopic repair is relatively more.Due to less postoperative pain and morbidity in laparoscopic repair, patients tend to be discharged early than open repair as a result less postoperative hospital stay.

Limitation
Limitations of study were less sample size, not randomized and not taking cost effectiveness into consideration.

Conclusion
The laparoscopic repair had significantly less postoperative pain due to less tissue handling. Patients after laparoscopic repair can be discharged early and therefore has less duration of hospital stay. Laparoscopic repair is much better than open repair due to less postoperative morbidity. So it is concluded that laparoscopic PUH repair is effective than open PUH repair in terms of postoperative pain and postoperative hospital stay.

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Original Article

ICU Outcomes and Survival in Patients with Severe Covid-19 in Tertiary Healthcare Level

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Abstract

Background: In the Wuhan region of China an outbreak of severe acute respiratory syndrome (SARS) was identified in December 2019 by a new corona virus SARS-CoV-2 and disease was named coronavirus disease-19 (COVID-19). On March 8, 2020 three cases of pandemic COVID-19 were confirmed by the Institute of Epidemiology, Disease Control and Research (IEDCR) for the first time in Bangladesh. Most of the COVID-19 cases are mild and even asymptomatic, but about 15% of the patients have a more severe presentation and approximately 5% are critically ill patients with difficult-to-treat hypoxemia, clotting disorders, renal failure. Important challenges to the management of these patients is to setting up of intensive care unit (ICU) on urgent basis at different level of health care in Bangladesh. Mortality rates reported in patients with critically severe COVID-19 in the ICU range from 50–65% and in patients requiring invasive mechanical ventilation, mortality rates have been reported to be as high as 97% in some early experience. Risk factors and optimum care issues are major challenge in COVID-19 management. **Objectives:** To identify risk factors associated with mortality of patients and to measure outcome with COVID-19 requiring treatment in Intensive care unit. **Settings and study design:** This retrospective, observational cohort study included 86 consecutive critically ill patients with laboratory-confirmed COVID-19 referred for ICU admission from July 2021 to November 2021 in Shaheed Sheikh Abu Naser Specialized Hospital, Khulna, Bangladesh. Infection with severe acute respiratory syndrome coronavirus was confirmed by RT-PCR assay of nasopharyngeal swabs with oxygen saturation less than 84% on more than 15 liters oxygen (O_2) via non rebreathing mask, or respiratory rate (RR) more than 22 per minute on 15 liters oxygen (O2) via non rebreathing mask. **Results:** Majority patient's age were between 50 to 80 years. There was no significant sex predomination, male and female patient were 51% and 49% respectively. Significant number of patients admitted in ICU having Diabetes Mellitus and/or hypertension, their treatment outcome is poor. 66 (76.75%) patients out of 86 were deceased and 20 (23.25%) were alive. **Conclusion:** Study showed overall mortality and ventilation related mortality in patients with severe COVID-19 admitted to ICU. Poor outcome depends on older age, associated comorbidities and severity of baseline vital signs at admission.

Keywords: COVID-19, ICU, Outcome.

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Introduction

In the Wuhan region of China an outbreak of severe acute respiratory syndrome (SARS) was identified in December 2019 by a new corona virus SARS-CoV-2 and disease was named coronavirus disease-19 (COVID-19) [1, 3]. The virus spread from China to Europe, America and then almost all country of the world. On March 8, 2020, three cases of pandemic COVID-19 were confirmed by the Institute of Epidemiology, Disease Control and Research (IEDCR) for the first time in Bangladesh [4]. Till then 12,261,252 PCR for COVID-19 test were done, 1,731,524 cases were confirmed. Among them 28,273 death were recorded [5]. In Khulna di-vision 102,487 cases were confirmed. COVID-19 is characterized by a flu-like syndrome, with symptoms such as fever, cough, myalgia, anosmia and gastrointestinal symptoms. Most of the COVID-19 cases are mild and even asymptomatic, but about 15% of the patients have a more severe presentation and approximately 5% are critically ill patients with difficult-to-treat hypoxemia, clotting disorders, renal failure [6]. Important challenges to the manage-ment of these patients is to setting up of intensive care unit (ICU) on urgent basis at differ-ent level of health care in Bangladesh.

Mortality rates reported in patients with critically severe COVID-19 in the ICU range from 50–65% [7-9] and in patients requiring invasive mechanical ventilation, mortality rates have been reported to be as high as 97% in some early experience [9]. Management of critically ill patients with severe COVID-19 have varied between cities and countries, and recent reports suggest a lower mortality rate [11].The regional and institutional variations in ICU outcomes and overall mortality are not clearly understood and are not related to the use experimental therapies with the use remdesivir [12], hydroxychloroquine/azithromycin [13], lopinavir-ritonavir [14] and convalescent plasma [15, 16] have been inconsistent in terms of mortality reduction and improvement of ICU outcomes. So it is our concern to provide optimum treatment in severe COVID-19 patient treated in ICU.

Materials and Methods

This is a retrospective cohort study was conducted at Shaheed Sheikh Abu Naser Specialized Hospital, Khulna, Bangladesh, where dedicated ICU was established to serve critical COVID-19 positive patient. We considered the following criteria to admit patients to ICU- Oxygen saturation less than 84% on more than 15 liters oxygen (O2) via non rebreathing mask, or respiratory rate (RR) more than 22 per minute on 15 liters oxygen (O2) via non rebreathing mask with positive PCR test for CVID-19. From July 2021 to November 2021 ICU of Sheikh Abu Naser Specialized Hospital, Khulna, Bangladesh was converted to COVID dedicated ICU to serve COVID-19 positive patients. Physicians from multiple discipline like anesthesiologist, cardiologist, nephrologist, rehabilitation specialist and nurses were deployed to serve this COVID-19 dedicated ICU after completion of online and offline training schedule. We collected all patient data like initial vitals, ICU interventions, therapies and lastly outcome of treatment like discharge to home or care in red zone ward for observation, complications and death. Categorical variables were expressed in counts, percentages and tabulated form.

Results

From July 2021 to November 2021 total 86 patients were admitted in COVID dedicated ICU at Shaheed Sheikh Abu Naser Specialized Hospital with oxygen saturation less than 84% on more than 15 liters oxygen (O2) via non rebreathing mask, or respiratory rate (RR) more than 22 per minute on 15 liters oxygen (O2) via non rebreathing mask with positive PCR test for COVID-19.

Table-1: Characteristics of patients with outcome admitted in ICU with COVID-19

Age (Years)	Total Number	Sex Distribution		Risk Factors				Patient Alive	Patient Deceased
		Male	Female	DM	HTN	CVD	CKD		
31-40	10	5	4	6	4	-	1	4	5
41-50	4	3	1	4	4	-	1	1	3
51-60	22	6	16	13	6	2	3	6	16
61-70	30	15	15	24	14	4	4	7	23
71-80	16	11	5	11	10	5	2	2	14
81-90	2	2	-	-	2	1	7	-	2
91-100	3	2	1	2	1	1	-	-	3
Total	86	44 (51%)	42 (49%)	60	41	13	12	20 (23.25%)	66 (76.75%)

DM-Diabetes Mellitus, HTN-Hypertension, CVD-Cerebrovascular Disease, CKD-Chronic Kidney Disease

Table-2: Baseline clinical characteristics of the patients admitted to ICU with COVID-19

Initial Vital Signs	Total Patients (86)	Patient Alive (20)	Patient Deceased (66)
Temperature ≥100ºF	4	1 (25%)	3 (75%)
Oxygen ≤ 90%	51	6 (12%)	45 (88%)
Respiratory rate ≥ 22/min	68	14 (20.5%)	54 (79.5%)
Heart rate ≥100/min	55	15 (27%)	40 (73%)
Systolic blood pressure(SBP) ≤ 90mmHg	5	-	5 (100%)

Table-3: ICU management and interventions patients with COVID-19

	Characteristics	Total Patients (86)	Patient Alive (20)	Patient Deceased (66)
ICU Interventions	Renal replacement	-	-	-
	Non-invasive ventilation	82	20	57
	Mechanical ventilation	36	2	34
COVID-19 Therapy	Azithromycin	1	1	-
	Amoxycillin+Clavulanic acid	4	1	3
	Hydroxy chloroquine	-	-	-
	Remdesivir	77	19	60
	Corticosteroids	80	25	60
	Anti-coagulants	79	26	60
Complications	Deep vein thrombosis	-	-	-
	Pneumothorax	-	-	-
	Decubitus ulcer	-	-	-

Table-1 shows baseline characteristics of the patients, no patient was found below 31 years and majority patients age were between 50 years to 80 years. There was no significant sex predomination, male and female patient were 51% and 49% respectively. Significant number of patients admitted in ICU having Diabetes Mellitus and/or hypertension, their treatment outcome is poor.

Baseline clinical characteristics of patients were shown in table-2, in COVID dedicated ICU

fever is not a significant sign but hypoxemia, high respiratory rate and tachycardia were common features.   All initial vital signs are directly related with patient's outcome and mor-tality rate is 100% in patients with hypo-tension (systolic blood pressure less than 90mm hg). There was no significant outcome difference among high temperature, hypox-emia and tachycardia.

Objectives of ICU management was to main-tain basic vital signs and to prevent compli-ca-tions, though there was no strict manage-ment protocol. Table-3 shows no support ther-apy was needed for renal failure, though about 14% patient had chronic kidney disease. Almost all patients were treated non-invasive ventilation and/or mechanical ventilation and few pa-tients were treated by both non-inva-sive and mechanical ventilation. Majority criti-cal pa-tients in ICU were treated with Remde-sivir, Corticosteroids and Anti-coagulants. No patients developed deep vein thrombosis, pneumothorax and decubitus ulcer in our series.

Discussions

Coronavirus disease (COVID-19) has affected millions of people worldwide, and several soci-odemographic variables, comorbidities and care variables have been associated with compli-cations and mortality. Factors related to increasing the probability of requiring ICU care or dying in patients with COVID-19 were identified, facilitating the development of anticipatory intervention measures that favor comprehensive care and improve patient prog-nosis [17]. In our study mortality was driven by age, presentation of severity on admission and pre-existing comorbidities like diabetes, hyper-tension and CKD. A registry-based cohort study in Swedish intensive care units for COVID-19 found mortality depends on age, baseline disease severity, the presence and degree of organ failure, rather than pre-existing comor-

bidities [18]. In our study no patient was found below 31 years and majority patient's age were be-tween 50 years to 80 years. COVID-19 Lom-bardy ICU Network found Italy, the majority were older men, and a large proportion required mechanical ventilation and ICU mor-tality was 26% [19]. But our mortality rate was higher and it was 76.75%. A single-center, cross-sectional study in Poland shows patients required intubation and mechanical ventila-tion. ICU mortality was 67%. Hospital mortality among patients admitted to the ICU and those who were disqualified was 70% and 79%, respectively [20], which is similar to our study series.

Conclusion

Our study showed overall mortality and venti-lation related mortality in patients with severe COVID-19 admitted to ICU. Our study support-ed the previously reported overwhelmingly poor outcomes of mechanically ventilated patients with COVID-19 induced respiratory failure and ARDS. Poor outcome depends on older age, associated comorbidities and severi-ty of baseline features at admission.

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CONTENTS

Original Article

Prevalence of Dyslipidemia and Pattern of Lipid Profile among Medical Students

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Abstract

Introduction: Due to stress from burden of study, abnormal food habits are not uncommon in medical students. So, they are prone to have abnormal lipid profile (dyslipidemia). So, prevalence and pattern of dyslipidemia is searched in medical students. **Methods:** This study was conducted among 63 second year medical students of Satkhira Medical College, Satkhira, Bangladesh. After overnight fasting, fasting blood sample was taken and lipid profile test was done to see the prevalence of dyslipidemia and pattern of lipid profile parameters. **Results:** Mean total cholesterol level was 164.71 ± 16.37 mg/dl in male students while 161.05 ± 17.07 mg/dl in female students. Triglyceride level was 117.14 ± 8.63 mg/dl and 116.82 ± 8.93 mg/dl in male and female students respectively. HDL-cholesterol level was 45.10 ± 2.10 mg/dl and 45.71 ± 2.35 mg/dl in male and female students respectively. LDL-cholesterol level was 91.82 ± 25.78 mg/dl and 85.25 ± 29.48 mg/dl in male and female students respectively. 45.45% of male students and 21.95% female students have LDL cholesterol level more than advised target level. **Conclusion:** Though medical students of Satkhira Medical College do not have definite dyslipidemia but a significant percentage of them have LDL cholesterol above the target level and if kept unconcerned, it could have adverse health hazard on them.

Keywords: Lipid profile, dyslipidemia.

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Introduction

Due to the economic growth, reducing physical work and increasing popularity of western foods, dietary pattern of medical students are at the stage of rapid transformation. It has become a trend to take junk food once or twice in a month. Due to various reasons, habit of taking regular physical exercise is not established in medical students. As medical students have burden of increasing load of study, they are always in a state of mental stress which may have an impact on abnormal lipid profile.

Different studies have observed significantly higher prevalence of hypercholesterolemia and LDL hypercholesterolemia in urban populations [1]. Studies have investigated trends in the mean total, non-HDL, remnant and total: HDL cholesterol, triglycerides and HDL cholesterol in an urban Indian population [2]. Increased serum lipoprotein triggers micro vascular diseases that in addition to become a burden on affected individuals, also affect their families and the society at large in terms of economic and other hardships. Earlier studies

have reported a better lipoprotein status of apparently healthy elderly individuals living in rural Bangladesh [3].

Elevated serum lipids is a vital, potentially risk factor for cardiovascular chronic diseases in adults [4]. Many factors such as smoking, alcohol consumption and physical activity have a significant impact on blood lipid levels [5]. However, elevated blood lipids is modifiable and can be reduced by healthy lifestyle and rational medical intervention.

High rates of psychosocial morbidity among students are acknowledged. Compared to an age-matched population, medical students show higher anxiety and depression symptoms as well as higher suicide rates as a result of stress [6].

Stress is a challenge to the natural homeostasis of an organism; in turn, the organism may react to stress by producing a physiological response to regain equilibrium lost by the impact of the stressor. One such homeostasis that is disrupted is that of feeding behavior. Physiological aspects of eating behaviors have been long studied, and information is often derived from animal models fed standard lab chow. In humans, individual differences in food intake response are similarly noted – roughly 40% increase and 40% decrease their caloric intake when stressed, while approximately 20% of people do not change feeding behaviors during stressful periods [7]. These varying results may relate to the specific type of stressor manipulated, duration of stress provocation, and variations in the satiety and hunger levels at the start of the study. For example, mild stressors could induce hyperphagia, while more severe stressor, hypophagia [8]. However, other individual differences warrant consideration.

Therefore, it is obvious that, medical students are in continuous stress resulting in unfavorable eating of unhealthy food leading to dyslipidemia. This is why this study was conducted to know prevalence and pattern of dyslipidemia among medical students.

Materials and Methods

This was a cross sectional observational study which was done in department of Biochemistry of Satkhira Medical College, Satkhira, Bangladesh. After their first professional written examination, they were asked to come in the department of Biochemistry of Satkhira Medical College in fasting state. 5 ml of venous blood was collected and serum was prepared from it. From the serum total cholesterol, triglyceride and high density lipoprotein (HDL) cholesterol was measured. Low density lipoprotein (LDL) cholesterol was calculated by Fried-Wald equation.

Results

The mean values (±SD) of total cholesterol, trighyceride, HDL cholesterol and LDL cholesterol is shown in table 1. Table 1 shows that mean total cholesterol level was 164.71 ± 16.37 mg/dl in male students while 161.05 ± 17.07 mg/dl in female students. Triglyceride level was 117.14 ± 8.63 mg/dl and 116.82 ± 8.93 mg/dl in male and female students respectively. HDL-cholesterol level was 45.10 ± 2.10 mg/dl and 45.71 ± 2.35 mg/dl in male and female students respectively. LDL-cholesterol level was 91.82 ± 25.78 mg/dl and 85.25 ± 29.48 mg/dl in male and female students respectively. Target of LDL cholesterol is advised to maintain <100 mg/dl is all sexes. Table 2 shows the LDL cholesterol level >100 mg/dl in male and female students which shows that 45.45% of male students and 21.95% female students have LDL cholesterol level >100 mg/dl. Lipid profile pattern in sexes is shown in figure 1. Figure 2 shows the percentage of male and female students above desired LDL cholesterol target level.

Table 1: Mean (± SD) lipid profile parameters of medical students according to sex.

Lipid Profile Parameters	Male n = 22	Female n = 41
Total Cholesterol (mg/dl)	164.71 ± 16.37	161.05 ± 17.07
Triglyceride (mg/dl)	117.14 ± 8.63	116.82 ± 8.93
LDL-Cholesterol (mg/dl)	45.10 ± 2.10	45.71 ± 2.35
HDL-Cholesterol (mg/dl)	91.82 ± 25.78	85.25 ± 29.48

Table 2: LDL cholesterol level >100 mg/dl in male and female students.

Lipid Profile Parameters	Male n = 22	Female n = 41
LDL-Cholesterol Level >100mg/dl n (%)	10 (45.45)	9 (21.95)
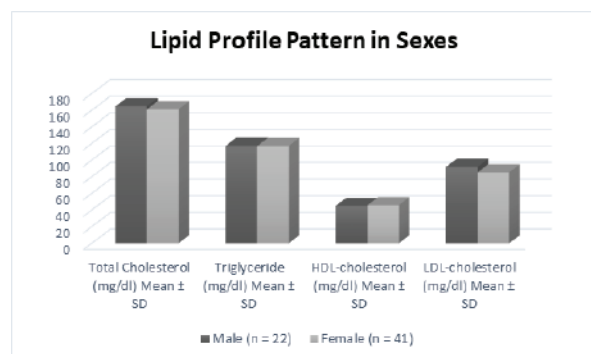
Figure 1: Lipid profile pattern in sexes of medical students.
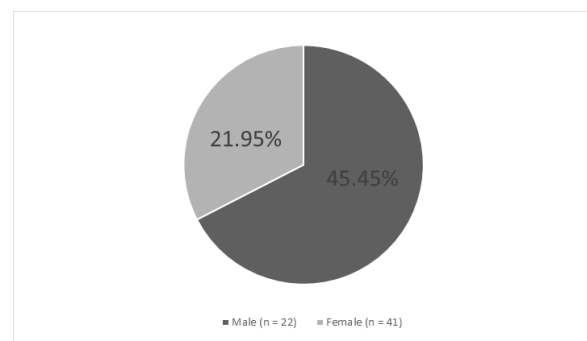
Figure 2: LDL cholesterol level above target level in male and female students.

Discussion

Medical studies are regarded stress full worldwide. The stress increases many fold during examinations. Change in eating behavior is common in stress full conditions. All these may lead to abnormal range of lipids in blood. With this in mind, the current study was done in second year medical students of Satkhira Medical College, Satkhira, Bangladesh. Fasting lipid profile was done to see any sort of dyslipidemia among the students.

Mean total cholesterol level was 164.71 ± 16.37 mg/dl in male students while 161.05 ± 17.07 mg/dl in female students. Triglyceride level was 117.14 ± 8.63 mg/dl and 116.82 ± 8.93 mg/dl in male and female students respectively. HDL-cholesterol level was 45.10 ± 2.10 mg/dl and 45.71 ± 2.35 mg/dl in male and female students respectively. LDL-cholesterol level was 91.82 ± 25.78 mg/dl and 85.25 ± 29.48 mg/dl in male and female students respectively (table 1). Our findings were somewhat similar to their study done by Liang W et al. 2015 [9]. But they found HDL cholesterol level >50 mg/dl in their students.

Target of LDL cholesterol is advised to maintain <100 mg/dl is all sexes [10]. And in our study we have 45.45% of male students and 21.95% female students have LDL cholesterol level >100 mg/dl. However, in their study on Chinese students Liang W et al. 2015 did not found their students with LDL cholesterol level higher than 100 mg/dl. This may be the impact of consuming fried food in our country.

Overall, the relationships between life styles, environments, social economics, blood glucose and blood lipid profiles should be taken into consideration in developing prevention strategy for dyslipidemia and pathoglycemia. Government and schools also should pay more attention to medical students' health, so that

the risks can be reduced and students can be in a healthy condition.

Conclusion

From the study it could be concluded that, students of Satkhira Medical College do not have definite dyslipidemia but a significant percentage of them have LDL cholesterol above the target level and if kept unconcerned, it could have adverse health hazard on them.

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Original Article

Medical Treatment of Adenotonsillar Hypertrophy: a Study on 50 Cases

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Abstract

Introduction: Adenotonillar hypertrophy is a common problem in pediatric patients. Common age of presentation is between 2-12 years. Medical and surgical treatment is available as the mode of treatment. **Objective:** To examine the efficacy of combined use of intranasal steroids, antibiotics and monteleukast for improving adenotonsillar hypertrophy. **Materials and Methods:** This prospective study was done at Bangladesh ENT Hospital, Dhaka from January 2020 to December 2020. 50 children were included with primary symptoms of mouth breathing, snoring and sleep disturbances. X-ray soft tissue nasopharynx lateral view was done before and after treatment for comparison. All were prescribed intranasal fluticasone, phenoxymethyl penicillin and monteleukast for 3 months and followed up after completion of 3 months treatment. **Results:** The age of the children ranged from 2-12 years with mean age 5.4 years. There were 30 female and 20 male with female male ratio 3:2. 30 patients (60%) got complete relief of primary symptoms, 12 patients (24%) got moderate improvement of symptoms and 8 (16%) patients got no benefit of medical treatment and referred for surgery. **Conclusion:** Intranasal steroid along with oral penicillin and monteleukast are effective in reducing size of adenotonsillar hypertrophy, relieving symptoms and reducing the need for surgery.

Keywords: Adenotonsillar hypertrophy, intranasal steroid, monteleukast.

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Introduction

The adenoids are a pyramid-shaped aggregation of lymphoid tissue in the nasopharynx [1]. The palatine tonsils are composed of lymphoid tissue and are situated in the lateral part of the oropharynx. Both the tonsils and adenoid are components of Waldeyer's ring, the ring of lymphoid tissue in the pharynx required in the production of immunoglobulins and development of both B and T cells [2, 3]. Adenotonsillar hypertrophy (AH) causes mouth breathing, nasal congestion, hyponasal speech, snoring, obstructive sleep apnoea (OSA), chronic sinus- itis and recurrent otitis media [4]. In the long term, OSA can lead to complications including growth failure, cardiovascular morbidity, neurocognitive abnormalities, learning and behavioural problems, hyperactivity, and poor attention [5].

Topical nasal steroids affect the anatomical components. They decrease inspiratory upper airway resistance at the nasal, adenoidal or tonsillar levels. Corticosteroids may decrease adenotonsillar hypertrophy via their lympholytic or anti-inflammatory effects. Intranasal

corticosteroids reduce cellular proliferation and the production of pro-inflammatory cytokines in a tonsil and adenoid mixed-cell culture system [6]. Evidence of a patho-physiologic link between AH and allergy suggests a possible role for intranasal corticosteroids (INS) and antiallergic monteleukast in the management of patients with AH [4]. The role of penicillin for tonsillar hypertrophy is doubtful but can prevent recurrent attack of tonsillitis.

Materials and Method
This prospective observational study was done at Bangladesh ENT Hospital, Dhaka from January 20 to December 2020 among the children presenting with mouth breathing, snoring at night, sleep apnea with or without deafness. 50 children were included for this study.

Inclusion criteria
• Children of 2-12 years old with primary nasal symptoms with or without ear symptom
• Children of adenotonsillar hypertrophy where surgery is contraindicated like bronchial asthma, cardiac problems etc.

Exclusion criteria
• Adenotonsillar hypertrophy with moderate to severe conductive deafness, gross septal deviation.
• Parents of children who don't rely upon medical treatment or want surgery.
• Children who are sensitive to penicillin.

Plain X-ray soft tissue nasopharynx lateral view was routinely done for all patients to see the size of adenoid and another X-ray after completion of 3 months treatment to see the improvement (Figure: 1 & 2). PTA and impedance were done if the child got ear symptom-/deafness. Medical treatment was given in the form of oral phenoxymethyl penicillin 5ml 2 times daily for 3 months, tablet Monteleukast 4 mg at night and Fluticasone nasal spray 1 puff at each nostril once daily for 3 months. In children age up to 5 years and tablet phenoxymethyl penicillin 250 mg BID, tablet Monteleukast 5-10 mg at night and nasal spray 2 puffs at each nostril once daily in older age group (6-12 years). Improvement was also assessed by taking history from the parents regarding nasal blockage, mouth breathing, snoring, sleep disturbance, dribbling of saliva and hearing improvement.

Results
Total number of patients in this study population was 50, female 28 and male 22 with female male ratio 3:2approax. (Table 1). Age of the patients ranged from 2-12 years with mean age 5.4 years and 64% of patient's age are between 2-5 years (Table II). Table III shows common symptoms at presentation. All patients (100%) presented with nasal symptoms like nasal blockage, mouth breathing and snoring. 40 patients (80%) presented with dribbling of saliva. 15 patients (30%) presented with sleep apnoea. 12 patients (24%) presented with conductive deafness. Table IV shows follow up of patients after 3 months medical treatment regarding nasal and oral symptoms. 30 patients (60%) got complete relief of nasal symptoms, 12 patients (24%) got 50% (moderate) improvent of nasal symptoms and 8 patients (16%) got no relief of nasal symptoms. Regarding 12 patients presented deafness, 8 patients (66%) got improvement of hearing loss and 4 patients (33%) got no change of hearing loss.

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

Sex	Frequency n (%)
Male	22 (44)
Female	28 (56)

Discussion
The size of the tonsil varies with age, hereditary qualities and pathological status. At the

Table II: Age distribution of patients (n=50)

Age group (Years)	Frequency n (%)
2-5	32 (64)
6-9	11 (22)
10-12	7 (14)

Table III: Distribution of the patients according to presenting symptoms (n=50)

Symptom	Frequency n (%)
Nasal blockage, snoring, mouth breathing	50 (100)
Sleep apnoea	15 (30)
Dribbling of saliva	40 (80)
Deafness	12 (24)

Table IV: Follow up of patients after 3 months of medical treatment (n=50)

Symptom	Frequency n (%)
Complete relief of nasal symptoms including sleep apnoea	30 (60)
Moderate improvement of nasal symptoms	12 (24)
No improvement of nasal symptoms	8 (16)
Improvement of deafness out of 12 patients	8 (66)
No improvement of deafness out of 12 patients	4 (33)

Figure 1: X ray nasopharynx lateral view showing adenoidal hypertrophy (before treatment)

Figure 2: X ray nasopharynx lateral view showing reduced size of adenoid (After treatment)

fifth or sixth year of life, the tonsils quickly increase in size, achieving their most extreme size at puberty. At pubescence, the tonsils measure 20–25 mm in vertical distance across and 10–15 mm in transverse diameter [7]. In all children, the adenoid volume increases with age, up to age of five or six years, and afterward diminishes step-by-step by age eight or nine years [8].

Adenoidal hypertrophy can be associated with sleep disorders ranging from snoring to OSA, which may produce both evening and daytime squeal (i.e. discontinuous sleep, sleepwalking, morning headache, trouble concentrating, drowsiness and enuresis) [9, 10].

Topical nasal steroids affect the anatomical components. They decrease inspiratory upper

airway resistance at the nasal, adenoidal or tonsillar levels [6]. Fluticasone and Nasonex® seem to have less bioavailability than older nasal steroids (e.g. beclomethasone) [11]. Mometasone furoate nasal spray has lower bioavailability. It has a broad first-pass metabolism and a moderately higher binding affinity for the glucocorticoid receptor compared with the other intra-nasal corticosteroids. It does not suppress the hypothalamic pituitary-adrenal axis when administered at doses of 100–200 mcg/day, which was clinically relevant. One study done by Modrzyn'ski M et al. showed three months of treatment with intra-nasal corticosteroids and antihistamine significantly reduced adenoidal hypertrophy (measured by endoscopy and acoustic rhinometry) and obstructive airway symptoms [13].

In a study by Jazi et al., 39 adenoidal hypertrophy patients were randomized to receive fluticasone or azithromycin for 6 weeks. Tonsillar size, adeno-tonsillar hypertrophy level and OSA symptoms (sleep apnea, hyponasal speech, snoring and mouth breathing) were assessed, via a self-administered questionnaire, before treatment, and at one week and eight weeks after treatment. Mouth breathing, snoring, hyponasal speech and sleep apnea improved significantly in both groups (p < 0.05). In both groups, the grade of obstruction was also significantly reduced [14]. In our study we use topical intranasal steroid, oral penicillin and antihistamine and reported that about 60% of our patient got complete relief of nasal symptoms after three months treatment.

Although medical treatment is one of the option but many of the adeno-tonsillar hypertrophy patients need surgical option that is adeno-tonsillectomy. The most common reasons for adeno-tonsillectomy in the pediatric population include history of recurrent tonsil infection, including peri-tonsillar abscess, and tonsil hypertrophy with associated sleep disordered breathing (SDB) and obstructive sleep apnea (OSA) [15].

Adeno-tonsillectomy operation is not without risk. Lane et al. evaluated 1780 patients who underwent tonsillectomy or adeno-tonsillectomy. Twenty-one of the patients (1.2 per cent) had a primary bleed and 69 (3.9 per cent) had a secondary bleed [14]. An estimated 2–3 per cent of patients experience haemorrhage and 1 in 40000 patients die from tonsillectomy-related bleeding 16, 17]. On the other hand topical corticosteroids are associated with fewer and milder adverse effects than oral corticosteroids. The local side effects of intranasal steroid therapy-primarily dry nose, crusting, bleeding and candidiasis have been well described in the literature [18]. In this study not a single patient got this type of side effects of topical nasal steroid.

Conclusion
As adenotonsillectomy is not without risks so non-surgical treatment methods have been considered for use in appropriate patients. Intranasal corticosteroids, used with antibiotics and antihistamines might reduce cellular proliferation and pro-inflammatory cytokine production in atonsil and adenoid mixed-cell culture system. They may reduce tonsillar, adenoidal or adeno-tonsillar hypertrophy, decreasing rates of surgery for adeno-tonsillar hypertrophy.

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