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Chattagram International Medical College Journal

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INFORMATION TO AUTHORS

Focus

Chattagram International Medical College (CIMC) established on 2013 is one of the famous and reputed Medical College among the Private Medical Colleges in Bangladesh as reflected by the performances of students in examinations of Chittagong University. A very good number of academicians and researchers are performing in this institute.

Chattagram International Medical College commenced to publish a peer reviewed scientific Journal from 1st January 2016 which is recognized by BMDC and having International Standard Serial Number (ISSN) 2520-484X. The journal publishes article of authors from any part of the globe, but has a special interest in publishing research articles of authors from Bangladesh and of relevance to developing countries. It publishes Editorial, Original (Research) articles, Special articles, Review articles, Short Communications, Case report and letters on new findings of Medical Science.

Chattagram International Medical College journal is published in english, biannually eg. January and July with prior approval of Editorial board.

Appropriate measures has been taken to make the journal indexed / abstracted in major international indexing systems including the PubMed/MEDLINE, Index Medicus, Google Scholar, DOAJ, Hinari and Scopus etc.

The theme of Chattagram International Medical College Journal is

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Submission of Manuscript

Manuscript (Papers) are submitted to the Editor-In-Chief or authorised persons at any time. Papers accepted for publication are subjected to peer review and editorial revision. With full title (Title should be concise and informative) two copies of papers (Along with CD) accompanied by a covering letter signed by Principal and Co-authors including name, academic degrees, designation, the departmental and institutional affiliation. Complete address, Cell number including Email address of Corresponding author should be mentioned. Not more than 7 (Seven) authors will be accepted for all manuscripts.

Manuscript should be typed in English (Font size and style : 10, Times New Roman) on one side of white bond paper of A4 size with margins of at least 2.5 cm, using double space throughout.

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A structured abstract should not be of more than 250 words. It should be a factual description of the study performed organized with the heading of Background (Includes aim or objectives) Methods (Includes patient population, procedures and data analysis) Result and Conclusion. The abstract should contain the data to support the key findings or conclusions of the study and this should be self explanatory without references to the text. the first time an abbreviated term is used it should be spelled out in full form and follow with the abbreviation in parentheses for example :- BPH (Benign Prostatic Hyperplasia). Please do not cite any references in the abstract.

3 (Three) to 10 (Ten) key words may be provided below the abstract using terms from the medical subject heading (Index Medicus, NLM, USA).

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Editorial : Its a invited article. Based on current affairs of Medical Science with any disciplines. Maxium length of the editorial may be with in 1500-2000 words and number of references maxium in 10 (Ten).

Original Article : A research, observational and experimental article should be devided into the following sections with headings :

- Introduction
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Single digit numbers used in the text should be in words except datas and reference numbers. Maximum length of text may be with in 6000-6500 words (Excluding abstract, table, figure and references). The total number of reference should not be less than 15 (Fifteen) for the original article.

Special Article / Short Communication

Its a medical based text of any disciplines. Maximum length of the Special article / Short Communication may be with in 2500-3000 words (Excluding abstract, table, figure and references). The total number of reference should not be less than 10 (Ten).

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- Introduction
- Search Strategy
- Discussion
- Conclusion
- Disclosure

Review article should not generally exceed 8500 words, including illustrations and the number of references should not be more than 30 (Thirty).

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Text of Case report with the following section

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- Case Report
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- Discussion
- Figure / Legends (If any)
- Conclusion
- Disclosure

Maximum length of the text may be with in 2000-2500 words (Excluding abstract and references). The total number of reference should not be less than 10 (Ten).

Letter

Letter should be brief and to the point with in 500-600 words only.

It is noted that standard abbreviations should be used whenever. The full form for which the abbreviations stands followed by the abbreviation in parenthesis should preceede the use of the abbreviation in the text except for standard ones like 45^{o}c, 35mg/L etc in all types of text.

References

Regarding references please follow the Vancouver style (Uniform requirements for manuscripts submitted to biomedical journals prepared by the International Committee of Medical Journal Editors (ICMJE guideline http://www.icmje.org).

Reference citations in the text should be numbered in arabic numerals at the end of the sentence eg [1,2] consecutively in order in which they are mentioned in the text.

Book references should have the name of the authors, chapter title, editors, Book name, the edition, place of publication, the publisher, the year and the relevant pages.

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The first six authors of a work should be named, followed by 'et al' if there are more than six. If less than six authors the name of the all authors may be mentioned.

Examples

Book reference : Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In : Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York, USA : McGraw Hill. 2002; 6:93-113.

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Table

- All tables should be numbered using Roman numerals (I, II).
- Table should always be cited in text in consecutively using Roman numericals (eg Table I, II).
- Mentioned the caption at the top of table. Table should be planned as brief as possible.
- Significance values and other statistical data should be included beneath the table.

Figures / Graphs

- All Figures / Graphs are to be numbered using Arabic numerals (1, 2).
- Figures / Graphs always to be cited in text in consecutively using Arabic numerical (eg figure 1, 2).
- Provide a caption at the bottom for each figures / graphs.
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Unmounted glossy print, B-2 size with good contrast (600 pixels). 3 Images / Photographys / Legends are allowed for whole text.

Declaration

The article should accompany a declaration signed by author and co-authors which includes a statement that neither the article nor any part of its essential subtance table or figures is published in any journal nor submitted elsewhere for consideration of publication before appearing in this journal. The declaration form must be collected from the office of Editor-In-Chief

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Competing Interests

Chattagram International Medical College Journal requires authors to declare any competing financial or other interest in relation to their work. Where an author gives no competing interests, the listing will read the author (s) declare that they have no competing interests.

Editorial

Chattagram International Medical College Journal
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Monkeypox : A Re-emerging Disease

Farid Uddin Ahmed[1*]

Since the advent of COVID-19, every infectious disease has come under the media scanner, giving the impression that a new pandemic has arrived and caused panic. The same is happening today with one of the rare viral infections, Monkeypox. The name monkeypox comes from the first discovery of the virus (A double-stranded DNA virus of the Orthopoxviridae family) in Monkeys in 1958 at a Danish laboratory. The first case was reported in a 9-month-old baby boy in 1970.

Before 2003, Monkeypox was confined to the central and western parts of Africa and believed to be endemic to several species of small mammals. The U.S.A reported an outbreak of human Monkeypox in 2003, with seventy-two cases, of which 37 were laboratory confirmed without any deaths or human-to-human transmission. A multi-country outbreak of Monkeypox (Reported in at least 20 countries) has been ongoing since early May 2022. As of June 15, 2022, 1,600 confirmed cases and almost 1,500 suspected cases of monkeypox disease had been reported to WHO from 39 countries – including seven countries where Monkeypox has been detected for years and 32 newly-affected countries.

In terms of mode of transmission, Monkeypox spreads among humans through sustained close contact, which could happen through respiratory droplets, bodily fluids, skin lesions or contaminated materials. Monkeypox isn't like the SARS-CoV-2 that caused the COVID-19 pandemic; it doesn't spread as easily, and because it's related to smallpox, FDA-approved treatments and vaccines are already available to stop it from spreading. So, although scientists are concerned because any novel viral behaviour is worrying, they are not panicked.

The clinical picture of Monkeypox starts with a smallpox-like prodrome after a 10- to the 14-day incubation period. Infections might be asymptomatic or subclinical. Rashes, fever, chills, headaches and muscle aches are recorded clinical symptoms.Although most cases have been mild, the condition can be more severe in small children, pregnant women, and those with compromised immune systems. The overall case fatality rate ranges from 0% to 11%. Polymerase chain reaction, electron microscopy and serology are some of the diagnostic approaches for Monkeypox infection. Immunization against smallpox reduces monkeypox transmission, and vaccination after exposure can help prevent or alleviate illness. The most prescribed antivirals are Tecovirimat (600 mg orally twice daily for 14 days), Brincidofovir (Two doses of 200 mg orally twice daily) and Cidofovir. For post-exposure prophylaxis, immunoglobulin is also recommended for 14-day treatment of patients, especially those immunocompetent.

The World Health Organization prescribes measures the same as those for COVID-19: masking, handwashing, disinfection of surfaces frequently touched surfaces, respiratory etiquette, distancing, and avoidance of large gatherings. No monkeypox case has been reported in Bangladesh so far. Considering the country's open borders, however, it could be just a matter of time before Monkeypox is detected here. It is good to hear that the government has already set up an inter-ministerial committee to curb the possible spread of Monkeypox. And just as we successfully tackled the spread of COVID-19, the public should be wary of the monkeypox disease because it has no cure. Also, the people must necessarily stick to the guidelines provided. We must keep Monkeypox out of Bangladesh.

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Original Article

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A Comparison of Symptoms and Clinical Outcomes between Vaccinated and Vaccine naive COVID-19 Infection

Hasina Nasreen[1*] Md Zakir Hossain[2] Rumana Rashid[3]

Abstract

Background: Postvaccination or breakthrough COVID 19 infections are increasingly reported from different parts of the world, but local data are scarce. The objective of this study was to analyze data of COVID-19 patients and compare differences in symptomatology and outcomes between vaccinated and vaccine-naive patients.

Materials and methods: One hundred and twenty-nine COVID-19 positive individuals treated as an in-or out-patient from the 1st January to 30th January 2022 in Bangladesh Institute of Tropical and Infectious Disease Hospital were considered for the study. Demographic details, symptoms, and need for hospitalization were obtained.

Results: Out of 129 included patients, 13 (10.1%) had a breakthrough infection. The mean age was significantly higher among the patients with breakthrough infection than the unvaccinated patients (54.4±16.7 versus 42.1±14.5 years, p=0.004).A comparatively higher proportion of vaccinated individuals had comorbidity than the unvaccinated patients (46.2% versus 21.6%, p=0.049). Twenty four (20.7%) unvaccinated patients required hospitalization and only 1 (7.7%) vaccinated patients need hospitalization (p= 0.261).

Conclusion: Vaccination with at least two doses of COVID-19 vaccine reduces the risk of serious illness.However, large-scale studies are needed to validate the present findings.

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Key words: Breakthrough infection; COVID-19; Postvaccination infection.

Introduction

Bangladesh began the administration of Coronavirus Disease 2019 (COVID-19) vaccines on 27th January 2021, while mass vaccination started on 7th February 2021.[1] As of October 2021, Bangladesh has fully approved 7 COVID-19 vaccines.[2] Vaccines effectively decrease the risk of COVID-19 infections by 70%–90% and protect from severe illness. It is, therefore, possible that some people who are fully vaccinated against COVID-19 may get infected by SARS-CoV-2. RNA in a respiratory specimen collected from a person at least 14 days after completing all recommended doses of the COVID-19 vaccine series is defined as a breakthrough infection and described to occur at a prevalence of around 1:10 000 in fully vaccinated persons.[3-6]

Data on virological characteristics and potential ongoing transmission risks, especially of mildly symptomatic or asymptomatic SARS-CoV-2 post-vaccination infections, remains limited, as observational studies have predominantly focused on endpoints such as critical illness, hospitalization requirement, and death.[7-10]

The purpose of the present investigation was to ascertain the symptoms and outcome of SARS-CoV-2 infections in patients who received either dose of vaccine and treatment from an Infectious Disease Hospital in Chattogram, Bangladesh and to compare with those not vaccinated.

Materials and methods

This descriptive cross-sectional study included confirmed COVID-19 patients treated as an in-or out-patient from the 1st January to 30th January 2022 in Bangladesh Institute of Tropical and Infectious Disease Hospital, Chattogram, Bangladesh. Ethical clearance was obtained from the Ethical Committee of the institute. Informed consent was obtained from the participants.

A total of one hundred and twenty-nine patients

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with confirmed COVID-19, with age more than 18 years were included in the study. Partially vaccinated (Vaccination with one dose) individuals were excluded from the study. A case record form collected data regarding demographics (Age and sex) comorbidity, symptoms, vaccination status, and hospitalization requirement. Fully vaccinated status at the positive PCR test result was defined as ≥14 days elapsed since the second vaccine dose. Patients who reported a previous diagnosis of any comorbid conditions (Like diabetes, hypertension, ischemic heart disease, chronic kidney disease, bronchial asthma, chronic obstructive pulmonary disease, malignancy, etc.) were defined as having comorbidity.

Data were analyzed by using SPSS version 23. Continuous variables were expressed as mean± standard deviation and are compared by Student's t-test for two groups. Qualitative or categorical variables are described as frequencies and proportions. Proportions are compared using chi-square or Fisher's exact test, whichever is applicable. Statistical significance was set at $p<0.05$ level.

Results

Out of 129 included patients, 116 were not vaccinated, and only 13 were fully vaccinated. The mean age was significantly higher among the patients with breakthrough infection than the unvaccinated patients (54.4±16.7 versus 42.1±14.5 years, p=0.004). In both groups, males were predominating without any statistical difference (Table I).

Table I Demographic characteristics of the patients according to their vaccination status

Variables		Not vaccinated (n=116)	Vaccinated (n=13)	p-value
Age, years		42.1±14.5	54.4±16.7	0.004*
Sex	Male	78 (67.2)	9 (69.2)	0.886†
	Female	38 (32.8)	4 (30.8)	

*Independent sample t-test; †Chi-square test.

A comparatively higher proportion of vaccinated individuals had comorbidity than the unvaccinated patients (46.2% versus 21.6%) and the difference was marginally statistically significant (p=0.049) (Figure 1).

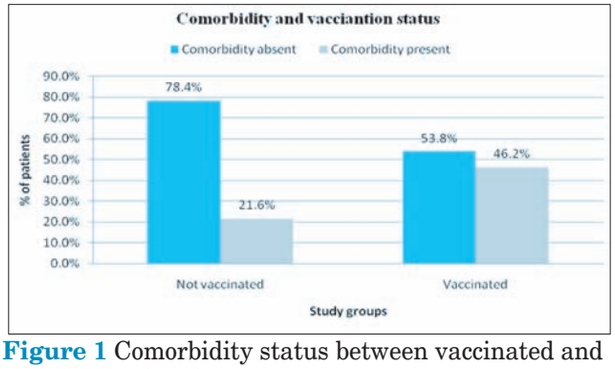

Figure 1 Comorbidity status between vaccinated and unvaccinated patients

There were no significant differences in the distribution of presenting symptoms between vaccinated and unvaccinated COVID-19 patients (Table II).

Table II Presenting symptoms of the patients according to their vaccination status

Symptoms	Not vaccinated (n=116)	Vaccinated (n=13)	p value†
Fever	110 (94.8)	13 (100.0)	0.401
Cough	114 (98.3)	13 (100.0)	0.633
Headache	10 (8.6)	3 (23.1)	0.101
Breathlessness	2 (1.7)	0 (0)	0.998
Fatigue/Malaise/Exhaustion	5 (4.3)	0 (0)	0.451
Myalgia	2 (1.7)	0 (0)	0.874
Anosmia	44 (37.9)	6 (46.2)	0.564

†Chi-square test

Out of 116 unvaccinated patients, 24 (20.7%) required hospitalization. On the other hand, out of 13 vaccinated patients, only 1 (7.7%) needed hospitalization. However, the difference failed to reach statistical significance (p= 0.261).

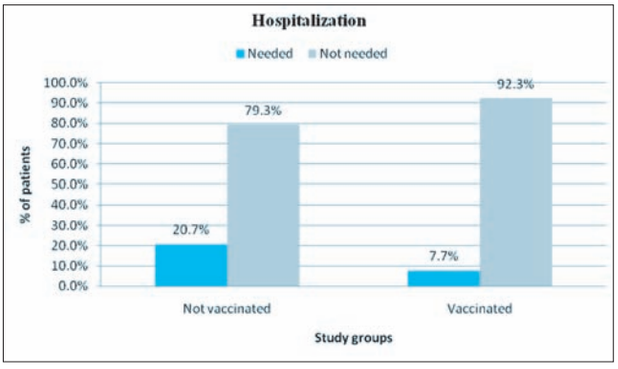

Figure 2 Need for hospitalization in vaccinated and unvaccinated patients

Discussion

Vaccine breakthrough infections after vaccinations are a matter of concern. Not much data are available regarding these infections.[11,12] Recent data from CDC stated that a total of 10,262 SARS-CoV-2 vaccine breakthrough infections had been reported from 46 U. S. states and territories as of April 30, 2021.[13]

In the present study, out of 129 included patients, 10.1% of the patients had a breakthrough infection. However, most of these cases of breakthrough infections were mild as they did not require hospitalization. A study conducted in India involving 113 hospital employees who had received COVID-19

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vaccinations showed symptomatic breakthrough infections after the second dose in 13.3% of the persons. Exceptfor one (required hospitalization), all 14 had mild COVID-19 disease.[14] Another study was conducted in a tertiary care hospital in Kerala, India, among its health care workers. It showed that breakthrough COVID-19 infections after vaccination with two doses of the ChAdOx1 nCoV-19 vaccine were mild in most of the HCWs. Even those HCWs who required hospitalization only had mild-to-moderate symptoms without requiring supplemental oxygen.[15]

The patients with breakthrough infection had a significantly higher mean age compared to the unvaccinated patients in the present study. Published data on sex distribution of post-vaccination diseases vary from favoring women or men to reflecting the entire population.[13,16,17] Concerning the current investigation, no sex difference was observed.

We observed that, though a higher proportion of vaccinated cases had associated comorbidity than the unvaccinated cases, the requirement of hospitalization was comparatively lower among the vaccinated group. Recent data suggested that, in addition to reducing the risk of acute illness, COVID-19 vaccination may have a protective effect against long COVID.[18]

Limitations

However, this study had certain limitations. Since it was a cross-sectional study conducted at a single center, the study's findings cannot be extrapolated to a larger population. Moreover, the partially vaccinated individuals were not included in the study.

Conclusions

In conclusion, breakthrough infections were more common among aged patients with comorbidity. However, symptomatology was similarbetween vaccinated and vaccine-naive patients. Comparatively few vaccinated patients required hospitalization than the vaccine naïve patients.

Recommendations

More research and larger data must be gathered regarding post-vaccination COVID-19 infection.

Disclosure

All the authors declared no competing interest.

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Original Article

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Predisposing Factors and Obstetric Outcome of Premature Rupture of Membrane

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Abstract

Background:

Premature Rupture Of Membranes (PROM) is a major obstetric concern.PROM is associated with adverse maternal and perinatal sequelae. The management of preterm premature rupture of the membranes needs careful consideration of the risks and benefits for both the mother and fetus. The aim was to investigate the risk factors of PROM and also to delineate the obstetric outcome.

Materials and methods : This cross sectional study was conducted in the department of Obstetrics and Gynecology, Rangpur Medical College Hospital, Rangpur between January and June 2010. Fifty pregnant women at their 3rd trimester (29-40 weeks) of pregnancy having rupture of membrane before initiation of labor were enrolled for the study.

Results: Incidence of PROM was 6.54% among patients from 29 weeks upto term pregnancy. 42% were between the age group of 20-24 years and primigravida. and 28(56%) belonged to >37weeks of gestation. Common associated conditions of PROM were irregular antenatal check up in 64% patients, history of last sexual contact within 10 days of rupture about 52%, urinary tract infection in 60% cases, lower genital tract infection in36.70%.E.Coli was the common pathogen found in 20% of the patients.68% had spontaneous onset of labor and in 20% cases labor was induced or augmented. Majority of the patients (74%) developed labor within 48 hours of rupture.Vaginal delivery occurred in 48% patients and caesarean section was done for 52% cases..Common complications included puerperal sepsis (12%), wound dehiscence (10%) and UTI in 6% of the cases. Two mothers delivered still born babies. Out of 48 alive babies 18(37.5%) babies were affected by the consequences of PROM and birth process. Among them 12.5% developed asphyxia, 4.16% developed Jaundice, 6.25% developed RTI and 14.58% sepsis.

Conclusion : PROM is considered to be a serious hazard for the fetus and mother. The clinical course of PROM is usually characterized by increased maternal and fetal morbidity. The ultimate goal of management must be towards the safety of mother and optimal perinatal outcome.

Key words : Labor; Premature Rupture of Membranes (PROM); Postpartum infection.

Introduction

Premature Rupture Of Membranes (PROM) refers to the disruption of fetal membranes before the onset of labor, resulting in the leaka-ge of amniotic fluid.[1] It affects 5% to 10% of all pregnancies, 8% of term pregnancies and 3% of preterm pregnancies.[2] When rupture of membranes occur beyond 37 week but before the onset of labor it is called term PROM and when it occurs before 37 completed weeks it is called pre-term PROM.[3] If 24 hours elapses between rupture of membranes and onset of labor, the problem is prolonged PROM.[4] Preterm PROM is estimated to be responsible for 10% perinatal deaths, either directly or indirectly. PROM at term is associated with adverse maternal and perinatal sequelae such as placental abruption, cord compression, cord prolapse, risk of cesarean birth, maternal and neonatal infection.[5] Preterm PROM is associated with fetal and maternal-morbidity and mortality including umbilical cord compression and prolapse, oligohydramnios,

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placental abruption, necrotizing enterocolitis, respiratory distress syndrome, fetal death, maternal intra-amniotic and postpartum infection risks.[6,7,8] The latent period is the interval between PROM and spontaneous labor onset and is inversely correlated with gestational age.[9] Most women with PROM at term experience spontaneous labor, with an incidence of 70% within 24 h, 85% within 48 h, and over 90% within 72h of ruptured membranes.[10] There is a risk of developing intra-amniotic infection (Chorioamnionitis) in 6%–10% of pregnant women with PROM at term, which increases many folds with prolonged rupture of membranes.[11]

The etiology of PROM may be multifactorial and underlying pathophysiologic mechanisms are not wellunderstood. The causes of PROM is hypothesized to be weakness in the chorio-amniotic membrane that is caused certain biochemical processes, such as collagen disruption within the extracellular matrix of chorio-amniotic membranes.[12] Microbial invasion of the amniotic cavity and increased placental inflammation can lead to PROM in around 20%–50% of pregnant women.[13] The conditions associated with PROM are maternal infection (UTI, lower genital tract infection, sexually transmitted disease), intra uterine infection, cervical incompetence, multiple previous pregnancies, hydramnios, nutritional deficit, decreased tensile strength of membranes, family history of premature rupture of membrane etc.[4] Some other significant risk factors associated with PROM are inadequate antenatal care, antepartum hemorrhage, recent coitus, smoking, previous H/O PROM or preterm labor, amniocentesis etc.[14,15]

The management of preterm premature rupture of the membranes needs careful consideration of the risks and benefits for both the mother and fetus. Decisions will depend on assessment of the relative influence of prematurity versus infection and oligohydramnios. The management of PROM at term and near term is still controversial. Some authors believe that aggressive attitude to PROM with immediate induction of labor leads to an increase caesarean section rate. On the hand, there are some authors who report on a significant increase in the rates of neonatal and maternal infection, if delivery occurs over 24 hours after PROM.Subsequently the mode of treatment of PROM has been changed in the past two decades. Recent attention in favor of PROM is focused on to maximize the benefit of lung maturity and avoid potential harm to the fetus and mother. The basis for the current management trend is a combination of better understanding of newborn physiology, improved neonatal care, improvement in antibiotic therapy and the widespread use of maternal and fetal monitoring.

The study was aimed to find out the risk factors of PROM and also to delineate the obstetric outcome so that we can reduce the mortality and morbidity caused by PROM.

Materials and methods

This cross sectional study was conducted in the Department of Obstetrics and Gynecology,Rangpur Medical College Hospital, Rangpur between January and June 2010. Ethical clearance for the study was taken from theHospital institutional review board. A total of 50 pregnant women at their 3rd trimester (29-40 weeks) of pregnancy having rupture of membrane before initiation of labor were enrolled for the study.Patients with ante-partum hemorrhage,severe preeclampsia, eclampsia, heart disease, diabetes mellitus and patients with established labor were excluded from this study. Purposive sampling was done according to the availability of the participants who had voluntarily joined this study. The purpose and procedure of study was discussed with the participants and informed written consent was taken. An interviewer administered questionnaire was used for data collection.

Statistical analysis of the results were performed by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-13). The results were presented in tables, figures and diagrams.

Results

Table I shows age range of the patients were between 15-39 years. Majority 21(42%) belongs to age group 20-24 years and majority of the patients 28(56%) belongs to >37 weeks of gestation. Majority 32 (64%) patients came from lower socio-economic group.

Table I Age distribution, Socioeconomic Condition and Gestational age of PROM patient (n=50)

Age Group	Number of Patient	Percentage (%)
15-19 Yrs	5	10.0
20-24 Yrs	21	42.0
25-29 Yrs	16	32.0
30-34 Yrs	04	8.0
>35 Yrs	04	8.0

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Socioeconomic Condition	Number of Patient	Percentage (%)
Lower income Group	32	64.0
Middle Income Group	10	20.0
Higher Income Group	08	16.0
Gestational Age	Number of Patient	Percentage (%)
Pregnancy>37 weeks	28	56.0
Pregnancy 34-37 weeks	12	24.0
Pregnancy 28-33 weeks	10	20.0

Table II shows 18(60%) patients had urinary tract infection, 11(36.69%) patients had lower genital tract infection and only 1(3.33%) patient had sexually transmitted diseases.

Table II Distribution of different diseases associated with PROM patients (n=30)

Associated diseases	number of patients	Percentage (%)
Urinary tract infection	18	60.0
Lower genital tract infection	11	36·69
STD	01	3·33

Table III shows majority of the patients developed labor within 24-48 hours and maximum patients within 72 hours of PROM.

Table III Distribution of PROM patients according to latent period (time internal between onset of PROM and onset of labor) (n=50)

Latent period	Number of patients	Percentage (%)
<24 hrs	17	34.0
24-48 hrs	20	40.0
48-72 hrs	8	16.0

Table IV shows that vaginal delivery took placein 24(48%) cases and 26(52%) patients were delivered by caesarean section. Caesarean section rate was higher in primigravida patients.

Table IV Mode of delivery of the patients (n=50)

Gravida 3(11.53%)	Mode of delivery			
	Vaginal delivery		Caesarean section	
	no	%	no	%
Primi	10	20.0	18	36.0
Multi	14	28.0	8	16.0
Total	24	48.0	26	52.0

Table V shows majority of the patients 34(68%) had no maternal morbidity after PROM and only 16(32%) patients had maternal morbidity after PROM. Among the morbid patients majorities 6(12%) suffered from puerperal sepsis.

Table V Distribution of maternal morbidities (n=50)

Maternal Morbidity	Number of patients	Percentage (%)
Absence of Maternal Morbidity	34	68
Maternal Morbidities	16	32.0
Puerperal Sepsis	06	12.0
UTI	03	6.0
Wound Dehisence	05	10.0
Retained Placenta	01	2.0
PPH	01	2.0

In the table VI shows out of 48 alive babies 62.5% babies were free from any morbidity,18(37.5%). Among them 6(12.5%) babies developed asphyxia, 2(4.16%) developed Jaundice, 3(6.25%) developed RTI and 7(14.58%) developed sepsis and there was no neonatal mortality after birth.

Table VI Distribution of perinatal outcome (n=48)

Perinatal outcome	Number of patients	Percentage (%)
No Morbidity	30	62.5
Morbidity	18	37.5
Asphyxia	6	12.5
RTI	3	6.25
Jaundice	2	4.16
Sepsis	7	14.58
No of mortality	00	00

Discussion

Study objects were sub grouped to three groups for planning of management purpose because of variation in the incidence of neonatal complication at different gestational age. 28(56%) patients were between >37 weeks, 12(24%) were between 34-37 weeks and 10(20%) were between 28-33 weeks of gestations. This is similar to other study conducted by Monowara and colleagues where findings were 62% term and 38% pre-term PROM.[16]

In our study incidence of PROM was more in primigravida 27(54%) than multigravida 21(42%) and only two were grand multi. In a similar study byLodfors also showed that primigravida is a risk factor for PROM.[17] In this study majority of the

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patients 25 (50%) constituted BMI within 20-25ie within normal range. Inadequate antenatal care is a risk factor of PROM. In our study 64% patients were in irregular checkup, 20% had no checkup and only 16% had regular ANC.A study conducted by Gosse link CA et al showed that inadequacy of antenatal care may be a marker for less healthy behaviors, life style, environmental factors among women at increased risk for PROM.[18] This study shows significant correlation between sexual behavior and PROM. Majority of the patients 26(52%) had last sexual contact within 10 days of rupture of membranes, 14(28%) patients had contact within 48 hours of rupture.

Imas et al in his study showed prevalence of microbial invasion of amniotic cavity with PROM as 18% to 44%.[19] Study of Monowarashowed that positive aerobic HVS culture was about 36% which is almost similar to our study.[16] This study show that 17(34%) patients developed labor within 24 hours of premature rupture of membranes, 20(40%) patients developed labor within 24-48 hours of rupture, another 8(16%) patients developed labor within 48-72 hours of PROM and 5(10%) patients developed labor after 72 hours of rupture. So, majority of the patients developed labor within 24-48 hours.In this study majority of patients 34(68%) had spontaneous onset of labor. Labor was induced/ augmented in 10(20%) patients and 6(12%) patients had come without any history of labor pain. so majority of the patients had spontaneous onset of labor. In our study, 48% cases had vaginal delivery and 52% cases were delivery by caesarean section. Majority (30.76%) of cases caesarean section was done due to mal-presentation (Breech or transverse lie) and for oligohydramnios and fetal distress (19.22% Oligohydramnios increase the number of caesarean sections because it increases alterations in fetal heart rate due to cord compression.[20]

Regarding perinatal outcome out of 48 alive babies 62.5% babies were free from any morbidity, 18(37.5%) babies were affected by the consequences of PROM and birth process. Among them 6(12.5%) babies developed asphyxia, 2(4.16%) developed Jaundice, 3(6.25%) developed RTI and 7(14.58%) developed sepsis. There was no neonatal death among the patient studies during hospital stay. Hospital stays following delivery of PROM patients were short. Because of scarcity of hospital beds PROM patients with vaginal delivery were discharged earlier and some were referred to neonatal unit for their baby and follow-up were not possible after their discharge. So real number of morbidity and mortality cannot be estimated from this study. We need community based large scale study on PROM to know exact incidence of PROM and effects of PROM on maternal and neonatal health.

Limitations

The present study was conducted withina short period of time. The study population was selected from one selected hospital, so that the results of the study may not be reflect the exact picture of the country. Small sample size with purposive sampling was also a limitation of the present study. Therefore, in future further study may be undertaken with large sample size.

Conclusion

PROM is considered to be a serious hazard for the fetus and mother. The clinical course of PROM is usually characterized by increased maternal and fetal morbidity. The ultimate goal of management must be towards the safety of mother and optimal perinatal outcome.

Recommendations

- Health education of community people, awareness development on health problem is important steps to prevent the occurrence of PROM.
- Improvement of socioeconomic condition and improvement of nutritional status may play a role to prevent PROM.
- All pregnant women should be screened during ANC to identify risk factors of PROM.
- Strengthening of EOC and maternal and child health programmed by properly activating the health infrastructure starting from village up to district and above.
- Multi-centre large scale multi variant studies are required to find out the causes of PROM as well as to compare and contrast the accuracy and efficacy of different management approach.

Disclosure

All the authors declared no competing interest.

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Original Article

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Basis of Aetiologyof Primary Hypothyroidism: Autoimmunity in the Background of Iodine Deficiency, Status and Correlation

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Abstract

Background : Primary hypothyrodism is define as low levels of blood thyroid hormone due to destruction of the thyroid gland. The main objective of this study is to analyze the conjuncture in the Bangladeshi population following a successful community-based iodine supplementation program by examining the patterns and determinants of autoimmunity in hypothyroidism patients at a tertiary care hospital in Chittagong.

Materials and methods: This cross-sectional study included 220 consecutive, newly detected, biochemically confirmed eligible hypothyroid patients who attended the Endocrinology Department at Tertiary level Hospital, Chittagong, Bangladesh, between October 2019 and November 2020.

Results: Out of a total of 220 participants, majority (38.0%) of the participants belonged to age 21-40 years with mean age was 31.9±11.2 years, 128(64.0%) were female, 144(72.0%) come from rural area, 11(5.5%) had family history of thyroid disorder and 35(17.5%) had BMI ≥30 kg/m^2 with mean BMI was 26.5±4.4 kg/m^2. Almost two third (32.3%) of the participants were found anti-TPO and/or anti-Tg positive followed by 66(30.0%) were only anti-TPO positive, 44(20.0%) were only anti-Tg positive and 39(17.7%) were both anti-TPO and anti-Tg positive. In females the prevalence was higher than in males (p<0.001). Differences in Thyroid Antibody and Autoimmune Thyroiditis prevalence between iodine intake groups did not reach statistical significance. Variables related to TA were female sex (OR 2.76 (1.85–4.91), p<0.001).

Conclusion: Females had a greater frequency than men. There were no statistically significant differences in TA and AT prevalence across iodine consumption groups. Almost two-thirds of the individuals were found to be anti-TPO and/or anti-Tg positive, with 30.0 percent being just anti-TPO positive, 20.0 percent being solely anti-Tg positive, and 17.7 percent being both anti-TPO and anti-Tg positive.

Key words: Anti TPO Ab; Anti TG Ab; Hypothyroidism; Iodine deficiency; Iodine Supplementation.

Introduction

Hypothyroidism is a prevalent thyroid condition in many low- and middle-income nations, with far-reaching public health implications.[1] The cause of hypothyroidism is complicated and frequently depends on iodine intake.[2, 3] Universal salt iodination (USI) has proven to be a highly cost-effective and efficient intervention for addressing iodine deficiency around the world.[4] While USI has reduced the prevalence of thyroid diseases, several nations have experienced unforeseen complications.[5] Adequate iodine consumption is required for normal thyroid function. Iodine shortage is linked to major consequences, but iodine excess may also cause thyroid dysfunction, and iodine supplementation to avoid iodine deficiency illnesses has been linked to the development of thyroid autoimmune. Since the implementation of iodoprophylaxis, particularly with iodine-enriched salt, the epidemiology of thyroid diseases has changed dramatically, resulting in a lower prevalence of goiter and neonatal hypothyroidism, improved cognitive function development in infancy, and a lower incidence of more aggressive forms of thyroid cancer.[6]

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Iodine deficiency early in life impairs cognition and growth, but iodine status is also a key determinant of thyroid disorders in adults. Severe iodine deficiency causes goiter and hypothyroidism because, despite an increase in thyroid activity to maximize iodine uptake and recycling in this setting, iodine concentrations are still too low to enable production of thyroid hormone. In mild-to-moderate iodine deficiency, increased thyroid activity can compensate for low iodine intake and maintain euthyroidism in most individuals, but at a price: chronic thyroid stimulation results in an increase in the prevalence of toxic nodular goiter and hyperthyroidism in populations.[7]

Hypothyroidism is more common in people with severe iodine deficit than in places with adequate iodine consumption.[8] However, the prevalence of subclinical and overt hypothyroidism is lower in areas of mild-to-moderate iodine shortage than in areas with optimal or excessive iodine consumption. A quick increase in iodine consumption can improve thyroid autoimmunity, probably by raising the antigenicity of thyroglobulin[11], although it's unclear if this effect will last.[9-11]. Thyroid autoimmunity is elevated in communities with low iodine intakes, according to multiple cross-sectional studies, probably because people with nodular goiter, which is more frequent in iodine shortage, typically have circulating thyroid antibodies.[12,13]

Iodine deficiency has long been thought to be the main cause of hypothyroidism in Bangladesh.[14] However, extensive research in a variety of ethnicities shows that iodine supplementation may be linked to an increase in autoimmune hypothyroidism. Increased iodine consumption is expected to have a similar effect in Bangladesh. The goal of this study is to analyze the conjuncture in the Bangladeshi population following a successful community-based iodine supplementation program by examining the patterns and determinants of autoimmunity in hypothyroidism patients.

Materials and methods

This cross-sectional study included 220 consecutive, newly detected, biochemically confirmed eligible hypothyroid patients who attended the Endocrinology Department at Tertiary level Hospital, Chattogram, Bangladesh, between October 2019 and November 2020. Those who were critically ill, too mentally unstable to interview, pregnant, had hypothyroidism induced by treatment for another thyroid illness or were aged 70 years or over were excluded from participating.

Hypothyroidism was diagnosed according to the American Thyroid Association (ATA) and the American Association of Clinical Endocrinologists (AACE) criteria, as having a thyroxine hormone (T4) level <0.8 ng/dL and a Thyroid-Stimulating Hormone (TSH) level greater than 5.50 μIU/mL. Thyroid autoimmunity was defined by measuring anti-thyroid peroxidase (Anti-TPO) and anti-thyroglobulin (Anti-Tg) antibody levels. Antibody positivity was defined as anti-TPO≥35 IU/mL and/or anti-Tg≥40 IU/mL according to the reference ranges of the corresponding laboratory. Body Mass Index (BMI) was classified according to the World Health Organization Guidelines, as: <18.5 kg/m^2 =underweight, 18.5-24.99 kg/m^2 = normal, 25-29.99 kg/m^2 = overweight and ≥30 kg/m^2 = obese. Socio-demographic information, history, and clinical information were obtained from participants during a face-to-face interview with a trainee endocrinologist.

The trainee endocrinologist conducted a physical examination and anthropometric assessment of each participant. Information on comorbidities and relevant treatment records, pathological and biochemical investigation reports, including thyroid hormone and thyroid autoantibody levels, were retrieved from patient records. Thyroid hormone levels were originally measured using direct chemiluminescent immunoassay technology with ADVIA Centaur XP, manufactured by Siemens Healthcare Diagnostic, USA. Thyroid autoantibody levels were measured using chemiluminescent sequential immunometric assay, with IMMULITE 2000 XPi system analyzers, manufactured by Siemens Healthcare Diagnostic, USA. Urinary iodine was determined in microplates by a modification of the Sandell-Kolthoff reaction. The results were compared with Inductively-c Coupled Plasma Mass Spectrometry (ICP-MS) for iodine, considered as reference method.Descriptive statistics (Mean±SD) were generated to assess patient characteristics and patterns of thyroid autoimmunity. All analyses were performed in SPSS ver 23. Patients with Autoimmune thyroiditis were defined, differentiated, and diagnosed with the following flow-chart according to their clinical manifestations and laboratory measurements [(Thyroid hormones (T3, T4, TSH) and thyroid auto-antibodies levels (Anti-TG, anti-TPO)].

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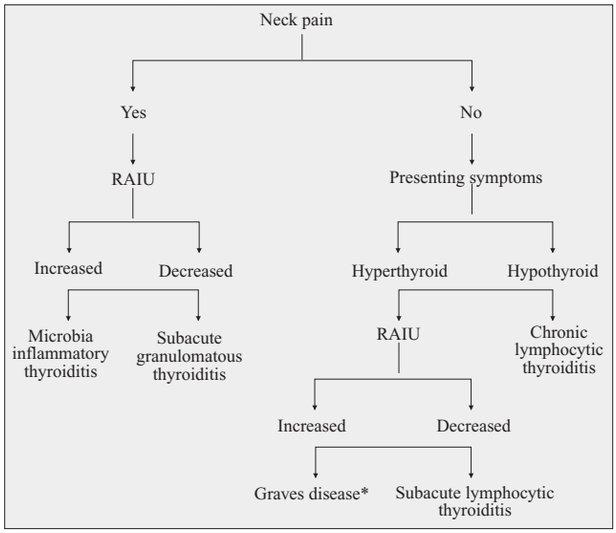
Differentiating Thyroiditis



*-Graves disease is not a subtype of thytoiditis

Clinical differentiation of the subtypes of thyroiditis. (RAIU = radioactive iodine uptake)

Results

Table 1 Baseline characteristics of study participants (n=220)

Variables	Frequency (n)	Percentage (%)
Age (Years)		
<20	62	31.0
21-40	76	38.0
41-60	57	28.5
>60	5	2.5
Mean ± SD	31.9 ± 11.2	
Sex		
Male	72	36.0
Female	128	64.0
Residence		
Urban	56	28.0
Rural	144	72.0
Family History of Thyroid Disease		
Yes	11	5.5
No	189	94.5
BMI (kg/m^2)		
<25.0	66	33.0
25.0-29.9	99	49.5
≥30	35	17.5
Mean ± SD	26.5±4.4	

Majority (38.0%) participants belonged to age 21-40 years with mean age was 31.9±11.2 years, 128(64.0%) were female, 144(72.0%) come from rural area, 11(5.5%) had family history of thyroid disorder and 35(17.5%) had BMI ≥30 kg/m^2 with mean BMI was 26.5±4.4 kg/m^2.

Table II Antibody positivity of study participants (n=220)

Variables	Frequency	Percentage
Only anti-TPO positive	66	30.0
Only anti-Tg positive	44	20.0
Anti-TPO and/or anti-Tg positive	71	32.3
Both anti-TPO and anti-Tg positive	39	17.7

Almost two third (32.3%) of the participants were found anti-TPO and/or anti-Tg positive followed by 66(30.0%) were only anti-TPO positive, 44(20.0%) were only anti-Tg positive and 39(17.7%) were both anti-TPO and anti-Tg positive.

Table III Prevalence (95% CI) of thyroid autoimmunity and autoimmune thyroiditis

	Thyroid Autoimmunity	Autoimmune Thyroiditis
Sex		
Male	2.1 (1.2-3.3)	1.2 (0.1-3.0)
Female	4.6 (2.7-6.5)	1.8 ((0.9-2.8)
Iodine Intake		
Deficient (Iodine Levels)	2.6 (1.3-4.8)	1.2 (0.1-3.0)
Adequate (Iodine Levels)	3.0 (1.4-5.9)	1.3 (0.1-3.6)
Above Requirements (Iodine Levels)	4.5 (2.4-6.2)	1.5 (0.1-3.7)
Excessive (Iodine Levels)	4.9 (2.7-8.4)	1.4 (0.1-4.0)

In females the prevalence was higher than in males (p<0.001). Differences in TA and AT prevalence between iodine intake groups did not reach statistical significance. Variables related to TA were female sex (OR 2.76 (1.85–4.91), p<0.001).

Discussion

In Bangladesh, the reported prevalence of autoimmunity among adults with hypothyroidism was 55% in 2000 and 80% in 2013.[15,16]

Current study showed that the majority (38.0%) participants belonged to age 21-40 years with mean age was 31.9±11.2 years, 128(64.0%) were female, 144(72.0%) come from rural area, 11(5.5%) had family history of thyroid disorder and 35(17.5%) had BMI ≥30 kg/m^{2}with mean BMI was 26.5±4.4 kg/m^2. Hannanet al reported the mean age of participants was 36.1±11.0 years and 70.1% were female.[1] The majority (72.7%) of participants came from a rural area of residence. The mean Body Mass Index (BMI) was 26.3±4.2kg/m^2 and 37.7% of the participants had BMI <25kg/m^2, 44.8% had BMI between 25 kg/m^2 and 29.9 kg/m^2 and 17.5% had BMI ≥30 kg/m^2. The proportion of overweight

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and obesity among the participants in the study was significantly higher (62.3%) than among the general Bangladeshi population (24%).[17] Animportant implication of the distinctive high prevalence of obesity is that this could be utilized as a screening tool for hypothyroidism in Bangladesh, where obesity is much less common in the population. Primary hypothyroidism is up to 8–9 times more common in women than in men, and the prevalence increases with age, with a peak incidence between the ages of 30 and 50 years.[18, 19] The present study shows that almost two third (32.3%) of the participants were found anti-TPO and/or anti-Tg positive followed by 66(30.0%) were only anti-TPO positive, 44(20.0%) were only anti-Tg positive and 39(17.7%) were both anti-TPO and anti-Tg positive. Hannan et al reported the frequency of thyroid autoimmunity in the study subjects was very high, 89% were positive for either anti-TPO or anti-Tg antibodies and 48.7% were positive for both.[1] More participants were positive for anti-TPO antibodies (82.5%) thananti-Tg antibodies (55.2%). The prevalence of TA in adults is around 10–13% and that of AT is 3–5% (In the elderly it goes up to 9.5%).[20-22] The only data from Spain available show a prevalence of TG ab of 9.7% and TPO ab of 3.4% in a sample of 400 individuals including adults and children older than 6 with a median UIE of 120 mg/l. Thyroid antibody positivity is almost universal (95%) among patients with overt hypothyroidism and present in ~ 50% with subclinical hypothyroidism, while 10–20% of the background population have thyroid antibodies.[23-26]

In females the prevalence was higher than in males ($p<0.001$). Differences in TA and AT prevalence between iodine intake groups did not reach statistical significance. Variables related to TA were female sex (OR 2.76(1.85–4.91), $p<0.001$). Garc a-Garc a et al reported the prevalences of TA and AT were 3.7% (2.4–5.0) and 1.4% (0.4–2.4).[27] TA is associated with female sex (OR 2.78, $p<0.001$) and age (OR 1.30, $P<0.001$). In regions with an optimal iodine supply, prevalence of AT ranges between 2.5% and 2.6% in India, 3.0% in Berlin and 3.6% in Turkey.[28-30] In the cross-sectional study of two regions of Denmark with mild or moderate iodine deficiency before saltiodisation, the incidence of autoimmune hypothyroidism was roughly 50% lower in the region with moderate iodine deficiency.[31]

Conclusion

Females had a greater frequency than men. There were no statistically significant differences in TA and AT prevalence across iodine consumption groups. Almost two-thirds of the individuals were found to be anti-TPO and/or anti-Tg positive, with 30.0 percent being just anti-TPO positive, 20.0 percent being solely anti-Tg positive, and 17.7 percent being both anti-TPO and anti-Tg positive.

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Disclosure

All the authors declared no competing interest.

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Original Article

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Correlation of Elevated Aspartate Aminotransferase and Alanine Aminotransferase with Homeostatic Model Assessment of Insulin Resistance in Non-Alcoholic Fatty Liver Disease

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Abstract

Background: In recent years, Non-Alcoholic Fatty Liver Disease (NAFLD) is considered as a novel component of insulin resistance and metabolic syndrome, which is found to be associated with mild elevation of liver enzymes. NAFLD is strongly associated with IR and is mostly silent which is often discovered incidentally through elevated hepatic enzyme levels.The aim of this study is to find out correlation of Aspartate Aminotransferase (AST) and Alanine Aminotransferase (ALT) with Homeostatic Model Assessment of Insulin Resistance (HOMA-IR) in Non-Alcoholic Fatty Liver Disease (NAFLD) subjects.

Materials and methods: A prospective hospital based cross sectional study was carried out in the Department of Biochemistry, Institute of Nuclear Medicine and Allied Sciences (INMAS) and Chittagong Medical College Hospital. One hundred and fifty (150) subjects aging between 18-60 years were included in this study by non probability consecutive sampling method. Important variables in this study were Fasting Plasma Glucose (FPG), Fasting Serum Insulin (FPI), serum AST and serum ALT. IR was calculated by using Homeostasis Model Assessment of Insulin Resistance (HOMA-IR) index i.e. (FPI μIU x FPG mmol/L)/22.5.

Results: In this study HOMA-IR was significantly higher in cases than that of controls (4.77±0.16). There was correlation of AST and ALT with HOMA-IR in NAFLD subjects.

Conclusion: The findings of the current study suggest that independent variable such as serum AST and ALT shows correlation with HOMA-IR in NAFLD subjects.

Key words: Alanine Aminotransferase (ATL); Aspartate Aminotransferase (AST); Homeostatic Model Assessment of Insulin Resistance (HOMA-IR);Metabolic syndrome (MS); Non-Alcoholic Fatty Liver Disease (NAFLD).

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Introduction

The aminotransferases (Transaminases) are sensitive indicators of liver cell injury.AST is found in the liver, cardiac muscle, skeletal muscle, kidneys, brain, pancreas, lungs, leukocytes and erythrocytes in decreasing order of concentration. ALT is found primarily in the liver and is therefore a more specific indicator of liver injury.[1] The aminotransferases are normally present in the serum in low concentrations. These enzymes are released into the blood in greater amounts when there is damage to the liver cell membrane resulting in increased permeability. The normal range for aminotransferases varies widely among laboratories, but generally ranges from 10-40 U/L.[1]

NAFLD encompasses a wide spectrum of liver diseases ranging from simple benign steatosis to steatohepatitis, fibrosis and cirrhosis.[2,3] In 1980, Ludwig et al published the first systematic description of what was then an “unnamed and poorly understood” condition.[4] On liver biopsy, findings resembled those of alcoholic hepatitis, but because the patients did not have a history of heavy drinking, the condition was named “nonalcoholic steatohepatitis”.[4] NAFLD is associated with long-standing elevations in liver enzymes and is related to higher risk of adverse cardiovascular events, oxidative stress, endothelial dysfunction and Metabolic Syndrome (MS).[5] Although not all patients with NAFLD are obese, obesity is considered the most important risk factor.[6] Typically, liver biopsy is the ultimate test

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for diagnosis and delineation of the extent.[1,7] It is usually not done except for situations of conflicting diagnosis. Liver ultrasonography although not sensitive enough to differentiate simple steatosis from more advanced hepatic involvement, is widely used.[7] Recently ALT/AST ratio has attracted great interest as potential novel marker of Insulin Resistance (IR).[1]

IR plays a fundamental role in the pathogenesis of NAFLD. IR may be defined as a condition in which higher than normal insulin concentrations are needed to achieve normal metabolic responses.[8] IR is evaluated according to HOMA-IR index method, as demonstrated by Marchesini et al.[9] Excess intra-abdominal fat may be a key determinant in the pathogenesis of NAFLD, due to its strong association with IR.[10] Several studies suggest that excess Free Fatty Acids (FFA) especially Non Essential Fatty Acid (NEFA) flux due to peripheral IR contributes to hepatic steatosis.[11] Several studies in Regression analysis results showed that ALT elevation increased the risk of NAFLD by 1.02 times. Other studies have demonstrated that ALT levels in adipose tissue increases in people with insulin resistance, oxidative stress and inflammation. ALT is considered as a compensatory response to an impaired hepatic insulin signal and is one of the significant indicators of hepatic damage.[12]

Henceforth considering the above information gathered and based on the research works demonstrated by different relevant authors, this study was aimed to investigate correlation of AST and ALT with HOMA-IR in NAFLD subjects.

Materials and methods

A prospective hospital based cross sectional studywas carried out in the Department of Biochemistry and Institute of Nuclear Medicine and Allied Sciences, Chittagong Medical College Hospital, which included one hundred and fifty (150) subjects aged between 18-60 years over a period of one year from June 2017- June 2018. Subjects of both the sexes were evaluated sonographically and were divided into two groups as NAFLD cases (n=80) and Non-NAFLD controls (n=70). Subjects were excluded if they tested positive for hepatitis B virus surface antigen or anti -hepatitis C virus antibody or were suffering from liver cirrhosis, Acute or chronic hepatitis, history of alcohol abuse, Type II DM and Pregnancy.

Data was collected using a pre-tested structured questionnaire containing all the variables of interest after taking informed and written consent. Using standard phlebotomy procedures 5 ml of fasting venous blood was drawn from the median-cubital vein in between 8 and 9 am. Blood taken into clean and dry test tubes were kept for clot formation. After centrifugation serum was separated and taken into eppendorf which was then immediately transported to Biochemistry Laboratory for analysis. FPG was determined by enzymatic oxidation in the presence of Glucose Oxidase. FPI assay was a two-site sandwich immunoassay using direct chemiluminescent technology which used constant amounts of two antibodies. IR was calculated from FPG and FPI values by HOMA-IR. AST and ALT reagent is used to measure aspartate aminotransferase and alanine aminotransferase activity respectively by an enzymatic rate method. The rate of change in absorbance is directly proportional to the activity of aminotransferase which is used by the system to calculate and express aminotransferase activity.

Statistical analyses were performed using SPSS for Windows version 20.0. Statistical inference was based on 95% confidence interval and p value ≤0.05 was considered statistically significant. Data were expressed as mean ± Standard Error of Means (SEM) and comparison between two groups was done using student t-test. Correlation between HOMA-IR and liver enzymes was tested using Spearman's correlation coefficient. The summarized data were presented in the form of tables and figure.

Results

Complete clinical profile, US data and serum samples were available for 150 subjects out of which, 80 (53%) were NAFLD cases and 70 (47%) were Non-NAFLD subjects taken as controls. Mean age was significantly higher in cases (35.05 ± 1.05 years) than that of controls (26.53 ± 1.02 years), p<.05. Among the NAFLD subjects, 66.3% were in age group 30-49 years. FPG (p=0.02) FPI (p<0.00001) and HOMA-IR (p<0.0001) were significantly higher in NAFLD cases [Table: I]. IR status was more prevalent among the NAFLD cases (p < 0.001) and 90% of NAFLD cases had IR (HOMA-IR >2.6) [Table: II]. There was a significant Association between NAFLD and HOMA-IR (χ^2 46.05, p< 0.001).Serum ALT (42.15±1.37 vs. 38.87±1.18) and AST (23.29±0.76 vs. 21.43± 0.73)

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were significantly higher in cases than that of controls, as $p < 0.05$ [Table: III]. In this study the bivariate correlation between HOMA-IR, AST and ALT was done. It revealed that, ALT & AST had a significant positive correlation with HOMA-IR [Fig I, II].

Table I Comparison of fasting plasma glucose, fasting serum insulin level and HOMA-IR value amongst the study population (n=150)

Variables	Cases (n=80) (Mean ± SEM)	Controls (n=70) (Mean ± SEM)	p value	Significance
Fasting plasma glucose (mmol/l)	5.63 ± 0.67	5.45 ± 0.6	p = 0.02	Significant
Fasting serum insulin (mIU/L)	19.00 ± 0.61	12.8 ± 0.73	p < 0.00001	Significant
HOMA-IR	4.77 ± 0.16	3.13 ± 0.19	p < 0.0001	Significant

Table II Association between NAFLD and HOMA-IRamongst the study population (n = 150)

Groups	Category of HOMA-IR		Total	Odds ratio (95% confidence interval)	p value & test statistic
	HOMA-IR >2.6	HOMA-IR ≤2.6			
NAFLD (Cases)	72 (90%)	08 (10%)	80	15.23 (6.34-36.59)	$\chi^2 = 46.05$ p< 0.001 Significant
Non-NAFLD (Controls)	26 (37%)	44 (63%)	70		
Total	98 (65%)	52 (35%)	150		

Table III Comparison of serum hepatic enzymes (AST & ALT) amongst the study population (n =150)

Variables	Cases (n=80) (Mean ± SEM)	Controls (n=70) (Mean ± SEM)	p value	Significance
Serum ALT(U/L)	42.15 ± 1.37	38.87 ± 1.18	p = 0.037	Significant
Serum AST(U/L)	23.29 ± 0.76	21.43 ± 0.73	p = 0.039	Significant

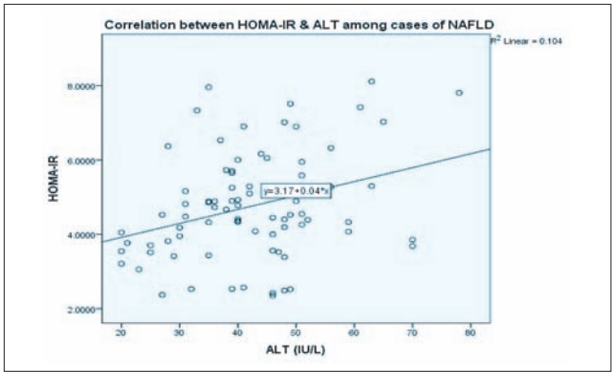

Figure I Scatter diagram showing positive correlation between HOMA-IR and ALT among cased (n=80)

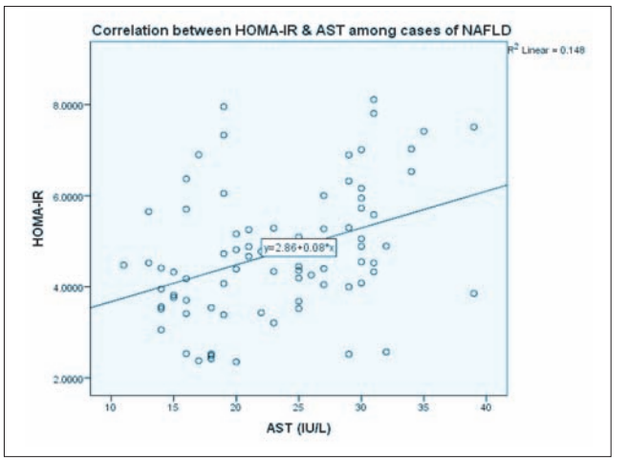

Figure II Scatter diagram showing positive correlation between HOMA-IR and AST among cases (n=80)

Discussion

Non alcoholic fatty liver disease is one of the most common chronic liver diseases in the world. In fact, the definition covers a broad spectrum, from simple fatty liver to steatohepatitis or even from cirrhosis to Hepatocellular Cancer (HCC).[12,13] Insulin resistance means that although there is insulin in circulation, it cannot show its biological properties. Defects occurring in many stages, from the binding of insulin to the cell receptor to the internal pathways, are thought to be responsible for this resistance.[13] Apart from fat-muscle-liver tissues, many systems such as growth, immune and nervous systems are affected by this condition. Although there are many methods that can measure insulin resistance, the Homeostasis Model Assessment-Insulin Resistance (HOMA-IR) index is used most frequently in the clinic because of its simplicity and cheapness.[14,15] Currently, NAFLD is the second leading indication for liver transplantation in the USA.[16] Clinically, obesity is closely associated with NAFLD, but there are still many people with a normal Body Mass Index (BMI) who are diagnosed with NAFLD. In the third National Health and Nutrition Inspection Survey of America, it was reported that liver steatosis could be detected by ultrasound in 7.4% of nonobese adults and in Asia, the figure was as high as 8–19%.[16] AST and ALT are often used to indicate the quality of liver function. In previous studies, ALT has been shown to be associated with NAFLD. Even ALT values within the normal reference range have been associated with a risk of NAFLD.[17] The ALT/AST ratio can be used to

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evaluate the degree of hepatic fat infiltration and hepatic steatosis. In a recent Framingham study, it was shown that the ALT/AST ratio could identify hepatic steatosis more accurately than using ALT or AST alone.[16] Complete clinical profile and US data with serum samples were recorded for one hundred and fifty (150) subjects. Among the subjects 80 were NAFLD and 70 were Non NAFLD. The Independent variables such as Serum ALT (p=0.037) and AST (p=0.039) were significantly higher in cases than that of controls. Spearman's correlation of AST and ALT with HOMA-IR showed positive correlation in NAFLD patients. Several cross-sectional studies have already demonstrated that higher ALT, even within the currently accepted normal reference interval, is associated with NAFLD.[18,19] A previous study also showed that ALT appears to have associations with hepatic insulin resistance and later decline in hepatic insulin sensitivity.[20] The results of the present study were similar to other previous research works by authors Kelley DE et al, Yoosoo, Sampath kumar.V et al, Rushad Patel et al and other relevant studies.[3,11,21,22] Uniform reference values for HOMA have not been defined yet. Tang et al states that HOMA cut-offs vary, depending on geographical area and the studied population. For various European regions, HOMA-IR identifying established IR has been reported to range from 2.0 to 3.8.[23] In the present study, the mean HOMA-IR was 2.6 in the NAFLD group. In a sample of 3636 males, Ying et al. demonstrated that HOMA-IR value increases as the number of MS components increases. For males with 3 or more MS components, HOMA-IR was 2.64.[24] Recent decades have witnessed an increase in the prevalence of child MS. Pastucha et al states that HOMA-IR cut-offs in children differ from those in adults.[25]

Limitations

The study has certain limitations which includes short duration of time, small sample size, cross sectional study and not assessing NAFLD by Liver biopsy.

Conclusion

The present study demonstrated that elevated ALT and AST had positive correlation with HOMA-IR in NAFLD subjects. Fasting blood sugar and fasting plasma insulin were also found to have positive correlation with HOMA-IR in NAFLD subjects. Though the liver enzymes were elevated, the AST:ALT ratio was found to be less than one. The ability to identify who is non-obese or overweight and who is insulin resistant could help health care professionals in bringing about lifestyle interventions by this study.

Recommendations

Proper measurement of these parameters can be recommended for further prospective population-based studies, lifestyle interventions and for better understand the biochemical strategy of these inflammatory markers for the development of NAFLD.

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Disclosure

Both the authors declared to have no conflicts of interest.

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Original Article

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FNAC Versus Core Needle Biopsy: A Comparative Study in Evaluation of Palpable Breast Lump in Chittagong Medical College

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Tasnuva Iqbal[4] Farzana Chowdhury[5]

Abstract

Background : Breast carcinoma is the most common malignant tumor and the leading cause of cancer deaths in women. CNB and FNAC are promising tools for the non-operative pathological diagnosis of breast cancer. Both have their own advantages and disadvantages. FNAC is a relevant, safe, economical, effective technique and an important method to diagnose breast cancer. It has got some other limitations that contributed to increase in the use of CNB. We therefore carried out this study to compare between FNAC & CNB, to increase the utility of CNB in the diagnosis of breast lump preoperatively and thus avoid unnecessary surgery.

Materials and methods: A cross-sectional study was done on 105 patient presenting with palpable breast lump in the Department of Pathology, Chittagong Medical College Hospital (CMCH) from January 2017 to December 2017.Diagnosis was made by doing FNAC, CNB and surgical excision biopsy and histopathology. Data were collected & analyzed statically by using SPSS version 23.

Results: The present study state that sensitivity and accuracy are more in CNB than FNAC, specificity and positive predictive value same for both and negative predictive value is more in FNAC. Statistical analysis using Fisher's exact test between individual diagnostic categories within FNAC & CNB reveals p <0 .001 which is highly significant. In this way correlation between FNAC, CNB and a combined FNAC and CNB with histopathological diagnosis of excision biopsy were established and showed statistically significant correlation (p value <0.001). Conclusion:From the findings of the present study, it was concluded that CNB in adjunct to FNAC can increase the efficacy of diagnosis in palpable breast lump. Together they can minimize the chance of missed diagnosis and also help to avoid unnecessary surgery in specific benign condition.

Key words: Breast lump; Core needle biopsy; FNAC.

Introduction

Breast carcinoma is the most common malignant tumor and the leading cause of cancer deaths in women with more than 1,000,000 cases occurring worldwide annually. It accounts for 22% of all female cancers, which is more than twice the prevalence of cancer in women at any other sites.[1]
The death rate for breast cancer has been slowly declining over the past decade. Twenty-five percent to thirty percent of women with invasive breast cancer will die of their disease. But this statistic, as grim as it is, also means that 70% to 75% of women with invasive breast cancer will die of something other than their breast cancer. Hence, a diagnosis of breast cancer, even invasive breast cancer, is not necessarily the "sentence of death" that many women imagine. Mortality rates are highest in the very young (Less than age 35 years) and in the very old group of patients (Greater than age 75 years). It appears that the very young have more aggressive disease, and that the very old may not be treated aggressively or may have co-morbid disease that increases breast cancer fatality.[2]
Breast cancer survival rates vary greatly worldwide,

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ranging from 80% or over in developed countries, around 60% in middle-income countries and below 40% in low- income countries. The low survival rates in less developed countries can be explained mainly by the lack of early detection programs, resulting in a high proportion of women presenting with late-stage disease, as well as by the lack of adequate diagnosis and overall management facilities.[3]

A large number of patients in Bangladesh have been suffering from breast cancer. Each year the number of patients is increasing. Because of existing social circumstances female patients are hesitant to be examined by the clinicians for breast lump, the patients are reporting in advanced stage of malignancy.[4]

Breast lesions are associated with an increased risk of breast cancer even though most of the breast lesions in women are benign.Greater than 95% of breast malignancies are adenocarcinomas, which are divided into in situ carcinomas and invasive carcinomas. Invasive carcinomas of no special type include the majority of carcinomas (70% to 80). Others are lobular carcinoma, tubular carcinoma, mucinous carcinoma, medullary carcinoma, papillary carcinoma and metaplastic carcinoma.[5]

The cytological or histological diagnosis of suspicious breast lesions by Fine Needle Aspiration Cytology (FNAC) and Core Needle Biopsy (CNB) have its advantage of allowing the planning of surgery or scheduling of neoadjuvant therapies for malignancy patients and limiting the number of operations for patients who do not have a malignant disease.

Concerning the preoperative assessment of breast cancer, both CNB and FNAC are promising tools for the non-operative pathological diagnosis of breast cancer. Nevertheless, FNAC and CNB are methodologically different and have their advantages and disadvantages.

FNAC is a diagnostic procedure that a pathologist or radiologist or surgeon uses a very thin needle (Usually 22- to 25-gauge) connected to a vacuumed syringe to aspirate a small amount of tissue from the suspicious area. FNAC was first introduced by Martin and Ellis in 1930. It's use to detect breast lesion became increasingly important from the 1980s as a diagnostic adjunct in the population based screening setting.

Aspiration cytology (FNAC) is a relevant, safe, economical, effective, and accurate technique and important method to diagnose breast cancer but its efficacy largely depends on the experience of aspirators and pathologists.

Technical problems such as limited cellularity, excessive air drying, artifactual mechanical disaggregation can potentially limit the interpretation, as well as contribute to a false-negative or a false-positive diagnosis of malignancy, respectively. However, the major current limitation of FNAC is the separation of Atypical Ductal Hyperplasia (ADH) from Ductal Carcinoma In Situ (DCIS) DCIS from invasive carcinoma and primary from metastatic carcinoma, which affect the patient's treatment. Other limiting factors include occasional inability to make a definitive diagnosis of low-grade carcinoma like tubular carcinoma or invasive lobular carcinoma, papillary and fibroepithelial lesions. Another major concern in breast FNAC is the potential false-positive diagnosis in benign reaction, inflammatory and metaplastic breast lesions, prompting inappropriate treatment having clinical and medicolegal implications.[6]

These limitations have contributed to increase in the use of Core Needle Biopsy (CNB). CNB is a technique that usually performed by a pathologist or surgeon using a large, hollow needle (A special 8- to 16-gauge) to withdraw small cores of tissue from the abnormal area in the breast. CNB was introduced to the assessment process in late 1990s. In addition to its high accuracy, CNB provides more material for definitive histological diagnosis, grading tumors and for assessing predictive factors like hormone receptor status and HER2 (Human Epidermal Growth Factor Receptor 2) status, after doing CNB if breast carcinoma is diagnosed then preoperative neoadjuvant chemotherapy can be given to a patient which facilitates the further treatment of the patient. Core Needle Biopsy (CNB) can distinguish between invasive cancer and carcinoma in situ for whom FNAC report is inconclusive due to inadequate sample but having suspicious ultrasound and/or mammography findings and breast lesions with microcalcification and for research purpose tissue banking specimen Core Needle Biopsy (CNB) is of great benefit.[7]

Multiple tumor tissue sample can be taken in Core Needle Biopsy (CNB) which makes the diagnostic process easier. Recent introduction of 14 G core

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biopsy needle and automated large core biopsy gun improves the diagnostic efficacy and the procedure becomes easier.[8]

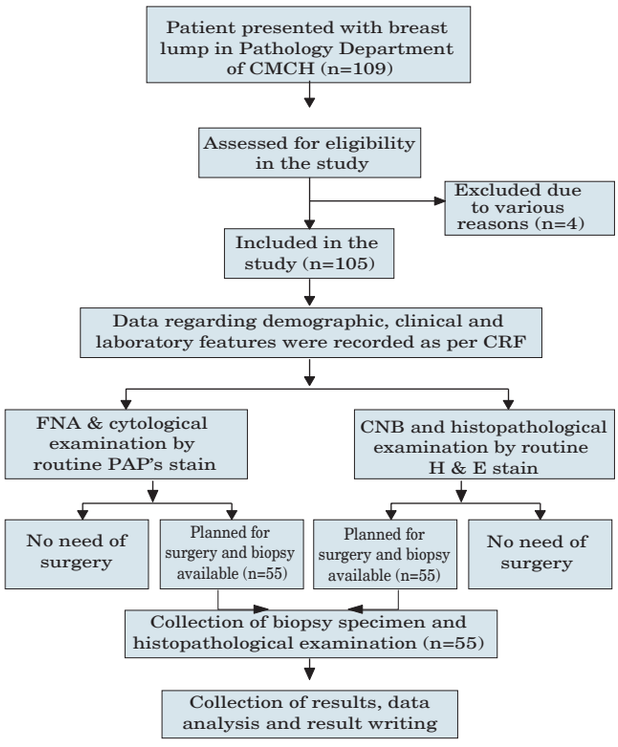
We therefore carry out this study to compare between Fine Needle Aspiration Cytology (FNAC) and Core Needle Biopsy (CNB) to increase the utility of Core Needle Biopsy (CNB) in the diagnosis of breast lump preoperatively and thus avoid unnecessary surgery in specific benign condition in Chittagong Medical College.

Materials and methods

It is a hospital based cross sectional comparative study done on 105 patients. Consecutive patients, irrespective of their age and sex, presenting with clinically palpable breast lump in the Department of Pathology of Chittagong Medical College from January 2017 to December 2017 were included in this study. Patients referred from Chittagong Medical College Hospital during the study period was also included in this study.

A structured questionnaire was developed to collect data from the patients. Clinical history questionnaire, thorough physical examination, and relevant investigations were recorded in details in all cases. The researcher herself carried out the interview with the patients. Core Needle biopsy (CNB) Fine Needle Aspiration Cytology (FNAC) and histopathological examination were carried out by the researcher.

Study Flow Chart :



Diagnosis was made by doing FNAC, CNB and surgical excision biopsy and histopathology. Data were analyzed by computer using SPSS version 23. To examine the relationship between variables, statistically significant test such as Chi square test was done. The findings of the study were presented with the help of frequencydistribution tables, charts, diagrams etc.

Results

Table I Correlation between FNAC & histological diagnosis of breast lesion (n=55)

Cytological diagnosis		Histopathological diagnosis					
FNAC	No. of cases	Concordant		Discordant		Kappa	p value
		n	%	n	%		
Benign	20	18	90.0	02	10.0	0.881*	<0.001
Malignant	35	34	97.1	01	2.9		
Total	55	52	93.5	03	6.45		

*Perfect agreement between tests.

Table II Correlation between CNB and histological diagnosis of breast lesion (n=55)

Cytological diagnosis		Histopathological diagnosis					
CNB	No. of cases	Concordant		Discordant		Kappa	p value
		n	%	n	%		
Benign	19	18	94.7	01	5.3	0.92*	<0.001
Malignant	36	35	97.2	01	2.8		
Total	55	53	95.95	02	4.05		

*Perfect agreement between tests.

Table III Correlation between FNAC and CNB with histological diagnosis of breast lump (n=54)

Cytological diagnosis		Histopathological diagnosis					
(FNAC & CNB)	No. of cases	Concordant		Discordant		Kappa	p value
		n	%	n	%		
Benign	19	18	94.7	01	5.3	0.919*	<0.001
Malignant	35	34	97.1	01	2.9		
Total	54	52	95.9	02	4.1		

*Perfect agreement between tests.

Out of 55 available sample for histopathological examination, 54 sample shows FNAC and CNB agreement. Out of these 54 samples, histopathological concordance was found in 52 (95.9%) sample (Table III).

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Table IV Diagnostic validity of FNAC of breast lump as compared with histopathological diagnoses (n=55)

Statistical parameters	Percentages (%)	95% CI* (%)
Sensitivity	94.44	81.34-94.32
Specificity	94.74	73.97-99.87
Positive predictive value	99.14	83.44-99.57
Negative predictive value	90.00	69.98-97.20
Accuracy	94.55	84.88-98.86

*CI: Confidence Interval.

Table V Diagnostic reliability of CNB of breast lump as compared with histopathological diagnoses (n=55)

Statistical parameters	Percentages (%)	95% CI* (%)
Sensitivity	97.22	85.47-99.93
Specificity	94.74	73.97-99.87
Positive predictive value	97.22	83.85-99.58
Negative predictive value	94.74	72.21-99.20
Accuracy	96.36	87.47-99.56

*CI: Confidence interval

Table VI Diagnostic reliability of combined FNAC and CNB of breast tissue as compared with histopathological diagnoses (n=54)

Statistical parameters	Percentage (%)	95% CI*
Sensitivity	97.14%	85.08% to 99.93%
Specificity	94.74 %	73.97% to 99.87%
Positive Predictive Value	97.14%	83.45% to 99.57%
Negative Predictive Value	94.74 %	72.23% to 99.20%
Accuracy	96.30%	87.25% to 99.55%

*CI: Confidence Interval.

Discussion

Core biopsy of palpable breast lesions, based on the histological study of tissue specimens, can provide reliable information to guide the surgeon. In fact, tissue specimens either by core biopsy or by doing surgical excision provide a level of certainty for diagnosis of malignancy which is greater than that obtained with FNA.[9]

As the breast lump is most common in female patients, all the patients of this study were female, no male patient were included (0%). In the study only 2% of the study population was male. As per larger studies on sex-incidence of breast carcinoma, it is an uncommon neoplastic condition in men, accounting for not more than 1% of all breast carcinomas.

Out of 105 patients, the numbers of married patient were 82(78.1%). Among the rests, 19(18.1%) case were from unmarried patients and 4(3.8%) cases were from widow patients. Among the 36 malignant cases, 34(94.4%) were married and one (2.8%) each of unmarried and widow patients. In this study most of the patients with malignant lesion were married, this is probably due to married women mostly presented to the out-patient department than unmarried ones.

In this study, among 105 patients, 50(47.6%) patients were from average socio-economic condition, 54(51.4%) patients were poor and only 1(1.05%) patient was from high socio-economic condition. This may be due to the fact that all the patients of the study attended in a government hospital and most of the people of average and poor socio-economic conditions usually come here to get treatment. Sandhu et al (2010) in their study also showed majority (89.8%) of the patients were from average to low socio-economic status which was done in India[10].

Comparison analysis was done in between the FNAC and histopathological diagnosis which showed there were perfect agreement between FNA and histopathological diagnosis (Kappa is 0.888). Out of 55 cases 52b (93.5%) showed concordance and 3(6.45%) showed discordance.

Comparison analysis was also done in between the CNB and histopathological diagnosis which also showed perfect agreement between CNB and histopathological diagnosis (Kappa is .92). Out of 55 cases 53(95.95%) showed concordance and 2(4.05%) showed discordance.

Out of 55 available samples for histopathological examination, 54 sample shows FNAC and CNB agreement. Of these 54 samples, histopathological concordance was found in 52 (95.9%) sample.

In the present study a combined FNAC and CNB reliability assessment also done as compared with excision biopsy histopathological diagnosis which showed combined sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy were 97.14%,94.74%,97.14%, 94.74% and 96.30% respectively.

So, the present study state that sensitivity and accuracy are more in CNB than FNAC, specificity and positive predictive value same for both and negative predictive value is more in FNAC. Present study also agrees with other studies mention above. Statistical analysis using Fisher's exact test between individual diagnostic categories within FNAC and CNB reveals p value <0 .001 which is highly significant.In this way correlation between

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FNAC, CNB and a combined FNAC and CNB with histopathological diagnosis of excision biopsy were established and showed statistically significant correlation (p value <0.001). Comparative analysis of FNAC and CNB in the diagnosis of breast carcinoma was done in the study of Saha et al 2016which also showed statistically significant correlation (p value <0.005) with the confirmatory histopathological examination of excision biopsy specimens. Statistically significant correlation also established between FNAC and CNB among themselves in the diagnosis of breast carcinoma (p value <0.005).

Limitations

The major limitations of this study were lack of skill and experience to do CNB and the small sample size. Though FNAC was practiced for many years but CNB was newly introduced to the Department of Pathology in the Chittagong Medical College. At the very beginning of the study CNB was done without any experience which causes inadequate sample and some misdiagnosis. But day by day skill and experience developed there after sample size and diagnosis become accurate.

Conclusion

Core Needle Biopsy (CNB) in adjunct to FNAC can increase the efficacy of diagnosis in palpable breast lump. Core Needle Biopsy (CNB) and FNAC together can minimize the chance of missed diagnosis of breast carcinoma and can also help to avoid unnecessary surgery in specific benign condition. CNB specimen can be used in determining the nature of neo adjuvant chemotherapy so it should be used more as a supplement of excision biopsy to reduce the hazard related to surgical excision biopsy.

Recommendations

- CNB in adjunct to FNAC can be effectively used in the present infrastructure of the tertiary hospitals in our country to differentiate benign from malignant breast lesions.
- A community based cross-sectional study or multi centered randomized trial can be carried out with adequate sample size to observe the sensitivity and specificity rate of CNB and FNAC alone and together in breast lesion.
- CNB can be a useful second line method of pathological diagnosis in order to minimize the chance of missed diagnosis of breast cancer. Whereas fine needle aspiration should be the first and excision biopsy should be the last option to obtain a pathological diagnosis.

Disclosure

All the authors declared no competing interest.

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Original Article

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Morphometry of Lumber Vertebral Canal in Adult Human

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Abstract

Background: Spinal canal stenosis is a clinical condition caused by narrowing of spinal canal resulting in compression of spinal cord along with nerve roots. It may affect any region of vertebral column but most frequently lumbar region. Determination of normal size of vertebral canal in lumbar region is of utmost important. This study aims at the morphometric measurement of lumbar vertebral canal in dried lumbar vertebra and compare them with the others published journal.

Materials and methods: 65 dry adult human lumbar vertebra were studied with the help of a digital vernier calipers in the Department of Anatomy, Southern Medical College. Transverse (Interpedicular) diameter and antero-posterior (Mid-sagittal) diameter of vertebral canal in lumbar vertebra are measured.

Results: The mean transverse diameter from L1 to L5 ranged from 19.08 ± 1.55 mm to 22.54± 2.55mm. The diameter showed an increasing trend from L1 to L2 but decrease at the level of L3; thereafter again showed an increase in mean value. In case of antero-posterior diameter it was seen that the diameter follows the same trend as transverse diameter with a value ranging from 14.61±1.63mm to 15.14±1.85mm from L1 to L2 and then decreases at L3 with a value of 13.30±3.39 mm, thereafter increases at L4 it was 13.96±1.85 mm and at L5 it was 14.67±2.73mm.

Conclusion: This study is done on the perspective to create a morphological value of lumbar vertebral canal to help the radiological interpretation on Bangladeshi people and diagnosis and treatment of various pathology related to lumbar vertebral canal.

Key words: Lumbar region; Sagittal diameter; Transverse diameter; Vertebral canal.

Introduction

A continuous series of vertebral foramina runs through the articulated vertebrae posterior to their bodies, and collectively constitutes the vertebral canal, which transmits and protects the spinal cord and nerve roots, their coverings and vasculature. The vertebral foramen is triangular in lumbar region. The first lumbar vertebral foramen contains the conus medullaris of the spinal cord, while lower foramina contain the cauda equina and spinal meninges. Variation occurs in the sagittal and coronal dimensions of the lumbar vertebral canal, both within and between normal populations. The deformity of the vertebral canal resulting from severe spondylolisthesis may lead to neural damage.[1] Compression of the spinal cord and nerves at the level of lumbar vertebra may be caused by lumbar canal stenosis.85% of the people suffer from low back pain due to deformity once in their life time.[2] It has been found that stenosis of the vertebral canal at the level of the lumbar as well as cervical level due to reduction in the sagittal diameter as well as decrease in interpedicular diameter referred as transverse diameter of vertebral canal which is one of the cause of primary narrowing of the spinal canal.[3] 85% of the people suffer from low back pain due to deformity of vertebral canal, amongst this 75% recover without surgery, 3-5% present with herniated disc while 1-2% present with compression of a nerve root.[4] The deformity of the vertebral canal resulting from severe spondylolisthesis may lead to neural damage.[1] Spondylolisthesis can be due to congenital, developmental, traumatic, degenerative or neoplastic.[4] The aim of this study

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is to show a shadow glimpse of lumbar vertebral canal for proper plan and management of lumbar vertebral canal in our perspective.

Materials and methods

A descriptive study was conducted at Southern Medical College and Hospital in the Department of Anatomy on 65 dry adult human lumbar vertebra from December 2020 to May 2021.Vertebra with deformity and congenital anomalies, also macerated bones were excluded from the study. After that each vertebra were assigned with a serial number. Measurements were taken with the help of a digital Vernier Calipers.

Transverse diameter of vertebral canal: It is referred as interpedicular distance. It is the maximum distance between the medial surfaces of the right and left pedicles of the same vertebra (Fig1).

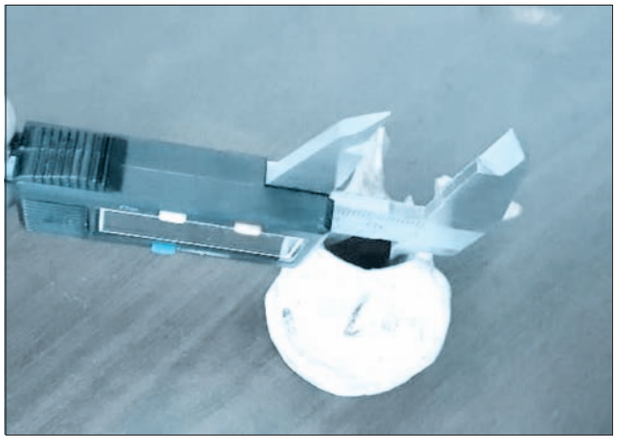

Figure 1 Measurement of transverse diameter of vertebral canal

Figure 2 Measurement of antero-posterior diameter of vertebral canal

Mid-sagittal diameter/ antero-posterior of the vertebral canal: It is the distance between the posterior border of the body of the vertebra and the lamina posteriorly at the midline (Fig. 2). All the data are then analysed by using IBM-SPSS Statistics v.20.0 for windows.

Results

Table I Inter-pedicular diameter (Transverse diameter of vertebral canal)

Vertebrae	n	Mean	SD	Range
L1	13	19.08	1.55	17.27 – 22.76
L2	13	20.60	1.75	18.25 – 24.81
L3	13	19.26	2.78	11.65 – 22.94
L4	13	20.51	1.55	18.58 – 23.52
L5	13	22.54	2.55	19.27 – 29.27

ANOVA test significance: p = 0.001, Highly Significant.

It is seen that transverse diameter of vertebral canal increases from L1 to L2, thereafter decreases at the level of L3 again showing an increasing trend at the level of L4 and L5. Mean values are found statistically significant (p = 0.001) (Table I).

Table II Mid-sagittal diameter (Antero-posterior diameter) of vertebral canal

Vertebrae	n	Mean	SD	Range
L1	13	14.61	1.63	12.24 – 17.27
L2	13	15.14	1.85	12.85 – 19.69
L3	13	13.20	3.39	4.19 – 19.30
L4	13	13.96	1.84	11.55 – 16.75
L5	13	14.67	2.73	10.03 – 20.60

ANOVA test significance: p = 0.280, Not Significant.

Antero posterior mean diameter of the vertebral canal showed a decreasing pattern at the level of L3 thereafter again showed an increasing trend. But the p value didn't show any significance (Table II).

Discussion

A number of factors affect the morphology of vertebral column. Factors may be external or internal. The shape of the vertebral canal in lumbar region varies from oval to triangular. The diameter of lumbar vertebral canal is influenced by ethical and racial difference with a regional effect. Assessment of the vertebral canal size is an important

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parameter to diagnose low back pain of unknown etiology. Although numerous studies on the morphometry of the lumbar vertebral canal have been conducted, the majority of these studies have relied on radiological evaluation in conjunction with MRI and CT scan analysis. But direct measurement of the vertebral canal using dried vertebra has the least amount of compatibility to the above ones.Studies done previously gives an idea that direct morphometric analysis gives a better, accurate and reproducible data.

It is seen that there is a wide range of variation in the dimensions of lumbar vertebral canal. In our study the mean transverse diameter of vertebral canal ranges from 19.08± 1.55 to 22.54±2.55mm from L1 to L5 with a decreasing tendency at the level of L3. This study show similar pattern as like Banik S et al et al with a mean ranging from 20.24± 1.839 at the level of L1 with 24.7±0.967 at L5 level with a decrease pattern at L3.[5] Also the study shows similarity with the study of Singh Jet al and Alam MM et al, El-Rakhway M et al and Aly T et al.[6-9] But the study is dissimilar with that of the Chawla K et al, Attar A et al, Kumar V et al, Khatiwada S et al, Mallik M et al, Marasini RP et al, Choubasia L et al, Tacar O et al, Mansur DI et al, Shrestha B et al, Begum Y et al, Sethi R et al where it is seen to increase gradually from L1 to L5, while in Kapoor Y et al it is found at the level of L1 18.51 mm, L5 it is 21.50 mm while from L2-L4 is 21.47 mm. But in Wankhede HA et al the diameter is least in L1 and maximum in L5 while almost similar in L2 to L4.[10-15,3,16,2,17-19,4,20]

Sagittal diameter of vertebral canal in our study is found to show narrowing at level of L3.

Maximum studies done previously shows the morphometric analysis either through plain X-ray or CT based. Some are on MRI study. A few study are based on either dry bones or on cadavers. As per data studied the present one show similarity with that of Aly T et al, El-Rakhway M et al, Kapoor Y et al, Banik S.[9,8,4,5] However the findings of the present one are in contrary to that of Mansur DI et al, Pierro A et al, where the diameter gradually decreases from L1 to L4 followed by an increase at L5.[2,21] These studies were conducted on plain X-ray and MRI respectively. The same trend is also seen in the study conducted by Singh J et al, Shrestha B et al, Saxena S et al has shown that there is a gradual decrease in the sagittal diameter of vertebral canal from L1 to L5.[16,17,22]

Conclusions

Through the present study, a morphometric data on vertebral canal of lumbar region is tried to set up on Bangladeshi people. Though we did not include age, sex or ethnicity in our study but it will provide a raw baseline data of our own. The present study is also compared with the plain X-ray and CT scan studies along with the studies of dried human lumbar vertebra. This will be helpful for radiologists, orthopedic surgeons and neurosurgeons for better diagnosis and treatment.

Disclosure

All the authors declared no competing interest.

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Original Article

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Study of Lipid Profie of the Patients with Acute Coronary Syndrom in a Tertiary Care Hospital

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Abstract

Background: Plasma lipid profile varies according to ethnic origin and geographical diversity. Scarcity of data on lipid profile among Acute Coronary Syndrome (ACS) patients in the rural community of Bangladesh makes the local physicians to relay on overseas statistics. The objective of the study was to estimate thepredictive value and revalidate an association of lipid profile with ACS in a rural population of Bangladesh attending a neighboring hospital with a Coronary Care Unit (CCU) facilities.

Material and methods: This was a cross sectional observational study carried out on a total of 36 ACS patients admitted in the Coronary Care Unit (CCU) and 50, age and BMI matched control subjects (Study period was October 2018 to April 2019). Biochemical tests including serum TC, LDL-C, HDL-C and TG. TC was measured and LDL-C, TC/HLDL ratio, LDL-C/HDL-C ratio and TG/HDL-C ratio was calculated. Standard statistical procedure was followed for analysis using IBM SPSS Statistics 25 version.

Results: lipid profile of cases (Patients with ACS) were significantly different when compared with the control group. TC and LDL-C levels showed a significant increase while HDL-C was significantly decreased bothin terms of mean ± SD and prevalence. This was similarly true in case of TC/HDL-C and LDL-C ratio, both in the perspective of mean ± SD and prevalence. Odds Ratio (OR) also indicated strong association between ACS and high TC, LDL-C, TC/LDL-C ratio, and LDL-C/HDL-C ratio and also low level of HDL-C. But we did not find any association of high TG and TG/HDL-C ratio with ACS (OR<1.0). Rather the mean ± SD and prevalence of these two parameters were higher among control groups when compared with ACS cases.

Conclusion: Lipid disorders are more prevalent among ACS cases which was not true for serum TG in our study outcome. High serum TC, LDL-C and low serum HDL-C is proved to be strongly related to ACS, but high serum TG was more prevalent among control subjects.

Key words : Acute coronary syndrome; Cholesterol; Lipid profile; Triglyceride.

Introduction

Non-Communicable Diseases (NCD) especially cardiovascular diseases, cancers, chronic respiratory diseases and diabetes mellitus, these four big killers account for the 63% of all deaths globally and 86% deaths in low- and middle-income countries like Bangladesh.[1] These diseases are largely preventable by means of effective interventions that tackle shared risk factors. Acute Coronary Syndrome (ACS) which include Unstable Angina (UA) Non-ST Segment Elevation Myocardial Infarction (NSTEMI) and ST segment elevation myocardial infarction (STEMI), are life-threatening cardiovascular events that remain a source of high mortality and morbidity despite advances in management.[2] Risk factors for Coronary Artery Disease (CAD) include hypertension, dyslipidemia, diabetes mellitus, age, male sex, cigarette smoking, obesity, sedentary lifestyle and stress. Control of blood pressure and

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cholesterol clearly reduce the risk of coronary events and mortality.[3] Lipid and lipoproteins have become increasingly important because of their association with CAD and the potential opportunity to modify this risk factor in prevention and management of life threatening CAD like ACS. The association of serum Low Density Lipoprotein Cholesterol (LDL-C) in the development of atherosclerosis and CAD has long been recognized, and reducing serum Total Cholesterol (TC) and LDL-C remains the primary focus for the prevention of CAD.[4,5] Elevated level of serum LDL-C is a major risk factor for cardiovascular events.[6] These relations are independent of other coronary risk factors mentioned above. Even low LDL-C with low level of High Density Lipoprotein Cholesterol (HDL-C) is more prevalent than predicted previously among CAD patients.[7] Some study also demonstrated that higher level of serum Triglyceride (TG) independently was associated with increased mortality in patient with established CAD.[8] Bangladesh made good progress in controlling communicable diseases in last few decades and now also experiencing the disease burden and major mortalities from NCDs like other developing countries of the world.[9] But unfortunately scarcity of data regarding these risk factors among the rural population, who represents the major population of the country, makes the situation practically difficult. Hence, this study was carried out to estimate thepredictive value and revalidate an association of lipid profile with ACS in a rural population attending a neighboring hospital with a Coronary Care Unit (CCU) facilities.

Materials and methods

This was cross sectional observational study carried out on a total of 36 ACS patients admitted in the Coronary Care Unit (CCU) of Khwaja Yunus Ali Medical College Hospital (KYAMCH) Enayetpur of Sirajganj over a period of 6 months from October 2018 to April 2019. ACS cases with liver impairment, renal disease or thyroid disease and patient taking lipid lowering agents were not included in the study. Voluntarily agreed adult subjects with age ranging from 35 to 71 years, were included after taking informed consent. A total number of 50 control subjects were recruited in the study from medicine outpatient department of the same hospital who had no history of any sorts of ischemic heart disease. All subjects underwent standard procedures of anthropometric measurements like body weight, height, Waist Circumference (WC) and Hip Circumference (HC). The two groups were matched for age and BMI (Table I). Subjects from both groups were with or without Diabetes Mellitus (DM) and Hypertension (HTN) but taking lipid lowering agents was considered as an exclusion criteria.

Blood from the patients diagnosed as ACS in the CCU was collected the next morning of their admission. Blood from control subjects was drawn after an overnight fasting of 8-14 hours. Blood samples were collected by venipuncture to assess the biochemical tests including serum TC, LDL-C, HDL-C and TG. TC was measured by enzymatic endpoint method (Cholesterol Oxidase/ Peroxidase) and HDL-C and TG by enzymatic colorimetric method. LDL-C was calculated by the Friedewald equation (Total cholesterol minus HDL-C minus triglycerides/5) when triglycerides were <400 mg/dl, and measured by ultracentrifugation when triglycerides were ≥400 mg/dl.

Data were expressed as mean ± Standard Deviation (SD). Comparison of mean values between two groups were tested using either Student's t-test (Unpaired) or Mann-Whitney 'U' Test. Chai Square Test and Fisher's Exact Test was done for categorical data, wherever appropriate. Waist Hip Ratio (WHR) was calculate bydividing waist circumferenceby the hip circumference. Body Mass Index (BMI) calculated as, BMI = weight (kg) ÷ height^2 (m). All statistical measures were performed using IBM SPSS Statistics 25 version.

Results

Among the case and control subjects male and female were 63.9%, 36.1% and 58.0%, 42.0% respectively. In this study the clinical characteristics of the subjects with ACS and controls are shown in Table I. Two groups were matched for age (p = 0.633), BMI (p = 0.655) and WHR (p = 0.923). The case (ACS) group showed no significant difference in age, BMI and WHR compared to controls (Table I). Mean ± Standard Deviation (SD) of age, BMI and WHR of case (ACS) and control were (50.58 ± 8.60, 25.88 ± 5.03, 0.948 ± 0.070) and (50.56 ± 8.53, 25.77 ± 5.17, 0.955 ± 0.073) respectively. Obesity based on BMI among case (ACS) and control subjects shown in Table II.

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Table I Characteristics of subjects

Variables	Case (ACS)	Control	sig. (p value)
Age (Years)	50.58 ± 8.60	50.56 ± 8.53	0.633
BMI (kg/m^2)	25.88 ± 5.03	25.77 ± 5.17	0.655
WHR	0.948 ± 0.070	0.955 ± 0.073	0.923

BMI, body mass index; WHR, waist hip ratio. p> 0.05, it signifies that subjects of case and control group were age, BMI and WHR matched.

Table II Showing obesity (Frequency) based on BMI among case and controls

	Underweight BMI < 18.5	Normal BMI: 18.5 – 24.9	Overweight BMI: 25.0 – 29.9	Obese BMI: 30.0 – 39.9	Extreme obese BMI > 40.0
Case	2.8%	52.8%	27.8%	16.7%	0.0%
Control	2.0%	48.0%	30.0%	20.0%	0.0%

BMI, body mass index, expressed as kg / m^2.

In the present study, lipid profile of case (Patients with ACS) was significantly different when compared to that of the control group. TC and LDL-C levels showed a significant increase while HDL-C was significantly decreased among the cases. Mean ± SD values of TC in the cases was 208.73±79.32 mg/dl vs. 174.33±49.00 mg/dl in the controls (p<0.05). LDL-C level in the cases was 158.51 ± 79.45 mg/dl vs. 112.40 ± 40.30 mg/dl in the controls (p<0.05). HDL-C level in the cases was 35.81 ± 7.28 mg/dl compared to 44.03 ± 13.62 mg/dl in the controls (p<0.05). But in case of serum TG in our study mean ± SD value of cases were lower than that of controls, which was 72.05 ± 42.93 mg/dl and 89.52 ± 72.60 mg/dl respectively. The difference in mean ± SD of TG values in case and control subjects was not significant statistically (p>0.05).

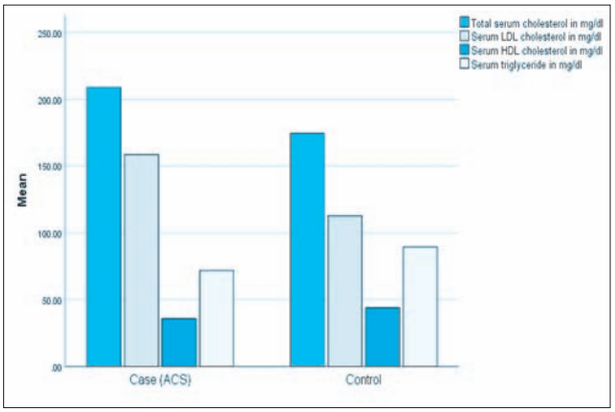

Figure 1 Lipid profile (mg/dl) comparison between case and control

Our study also revealed that mean ± SD value of TC/HDL-C ratio in cases were 6.03 ± 2.67 vs. 4.19 ± 1.46 in the controls (p<0.05) and LDL-C/HDL-C ratio in cases were 4.62 ± 2.67 vs. 2.76 ± 1.34 in the controls (p<0.05). In our study mean ± SD of TG/HDL-C ratio of case and control subjects were 2.06 ± 1.11 and 2.16 ± 1.74 respectively (p>0.05). It clearly appeared that the TC to HDL-C and LDL-C to HDL-C ratios were significantly higher in cases (patients with ACS) than controls, whereas the difference in TG to HDL-C ratio was not significant (Table III).

Table III Result of total case and control data

Variables	Case (ACS)	Control	p value
Total serum cholesterol in mg/dl	208.73 ± 79.32	174.33 ± 49.00	0.016
Serum LDL cholesterol in mg/dl	158.51 ± 79.45	112.40 ± 44.30	0.000
Serum HDL cholesterol in mg/dl	35.81 ± 7.28	44.03 ± 13.62	0.002
Serum triglyceride in mg/dl	72.05 ± 42.93	89.52 ± 72.60	0.257
LDL / HDL ratio	4.62 ± 2.67	2.76 ± 1.34	0.000
Total cholesterol / HDL ratio	6.03 ± 2.67	4.19 ± 1.46	0.000
TG / HDL ratio	2.06 ± 1.11	2.15 ± 1.74	0.739

LDL: Low Density Lipoprotein, HDL: High Density Lipoprotein, TG: Triglyceride.

Results were expressed as mean ± SD. Mann-Whitney U test was performed and the test of significance at 5% significance level.

In our present study we also found significantly higher frequencies (Prevalence) of high (Borderline high as per ATP III classification[10]) serum TC, LDL-C, TC/HDL-C ratio and LDL-C ratio and low (Borderline low[10]) HDL-C level among cases compared to control subjects. Rather higher level (Borderline high[10]) of serum TG and TG/HDL ratio were more prevalent among controls than the cases (ACS patients) but the differences were not significant statistically (Table IV). In our study the percentages of subjects with high (≥200 mg/dl) TC value among cases and controls were 44% vs 22% (p<0.05). In case of LDL-C the percentages of subjects with high (≥130 mg/dl) were 61.1% vs 24% among case and controls (p<0.05).

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Table IV Frequency (%) table of lipid abnormalities

	High TC level ≥200md/dl	High LDL-C level ≥130mg/dl	Low HDL-C level ≤40mg/dl	High TG level ≥150mg/dl	High TC / HDL-C ratio ≥5.0	High LDL-C /HDL-C ratio ≥3.3	High TG / HDL-C ratio ≥3.8
Case (ACS)	44.4%	61.1%	75.0%	5.6%	63.9%	69.4%	11.1%
Control	22.0%	24.0%	38.0%	12.0%	22.0%	32.0%	14.0%
p-value(Chi^{2}Tests)	0.027	0.001	0.001	*0.459	0.000	0.001	*0.755
OR (At 95% CI)	2.836	4.976	4.894	0.431	6.273	4.829	0.768

TC: Total Cholesterol, LDL-C: Low Density Lipoprotein-Cholesterol, HDL-C: High Density Lipoprotein-Cholesterol, TG: Triglyceride.

OR: Odds Ratio, CI: Confidence Interval .

High and low level of different serum cholesterol level mentioned were actually "borderline high" and "borderline low" cut-off values according to the ATP III classification[10].

*Fisher's Exact test value was taken as more than 20% cells have an expected frequency < 5.

The percentages of low HDL-C (≤40 mg/dl) subjects among case and controls were75% and 38% respectively (p<0.05). In case of percentages of subjects with high TG, rather it was less among cases than controls (5.6% vs 12%) but was not significant statistically (p>0.05). Considering subjects with high TC/HDL-C ratio (Ratio ≥ 5.0) it was 63.9% and 22% in cases and controls respectively (p<0.05), in case of subjects with high LDL-C/HDL-C ratio (Ratio ≥ 3.3) the percentages was 69.4% and 32% respectively (p<0.05). Percentages of subjects with high TG/HDL-C ratio (Ratio ≥ 3.8) among cases and controls were 11.1% and 14% respectively (p>0.05).

High level of serum TC [Odds Ratio (OR) 2.84 at 95% Confidence Interval (CI)] LDL-C (OR, 4.98 at 95% CI) and low level of HDL-C (OR, 4.89 at 95% CI) were proved to be associated risk factors for ACS in this study. We found no association with high level of TG (OR, 0.43 at 95% CI) and even high TG/HDL-C ratio (OR, 0.759 at 95% CI) with ACS in our study.OR for high TC/LDL-C ratio and high LDL-C/HDL-C ratio was calculated as 6.27 and 4.83 (Both at 95% CI) for ACS in this study (Table IV).

Discussion

Clinically important common lipid disorders include high LDL-C, low HDL-C, and high TG levels. Lipid disorders increase the risk of plaque buildup inside blood vessels, called atherosclerosis leading to CAD and ACS, the dangerous and potentially fatal presentation of the event. Monitoring and regulatory interventions for lipid disorders by lifestyle modification and medications clearly lower the risk of these fatal events.[11] This study aimed to perceive the association and estimation of lipid profile in ACS patients which include serum level of TC, LDL-C, HDL-C, TG and also the ratios of TC/HDL, LDL-C/HDL and TG/HLD which might be useful for risk assessment of CAD and dealing lipid abnormalities. The study is particularly important as scarcity of data regarding among target subjects, made the indigenous physicians compelled to depend on the statistics from abroad. We worked with cases of ACS, which obviously included STEMI and NSTEMI. The serum lipidprofile shows phasic fluctuations after any major cardiovascular events like STEMI and NSTEMI and the trend that follows include reduced serum TC, LDL-C, and HDL-C, and increased TG. Even serum TC may decrease up to 47%, serum LDL-C up to 39%, serum HDL-C up to 11%, and serum TGs may increase by almost 50% following acute myocardial infarction (STEMI & NSTMI).[12-14]

The present study reveals that serum TC, LDL-C, TC/HDL ratio, LDL-C/HDL-C ratio was significantly higher among cases (ACS patients) than the control subjects. This is evident both in terms of mean ± SD (Table III) and prevalence (Table IV). On the contrary serum HDL-C level of cases was significantly lower in terms of mean ± SD and prevalence, when compared with control subjects. Absolute serum TG level and TG/HDL-C ratio was found to be lower in cases when compared with controls, but the difference was not statistically significant.

According to the universally accepted cholesterol-diet-CAD hypothesis, increased plasma cholesterol concentrations increase the risk of CAD and decreasing plasma cholesterol levels decreases the risk of CAD.[15] In the present study we also demonstrated strong association between serum TC level and ACS (OR, 2.84 at 95% CI).

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In our study serum LDL-C was significantly higher among ACS cases than the control subjects, it also demonstrated higher percentages of study subjects with high serum LDL-C in cases when compared to control group. Recent studies like Francois M, at al also confirmed that the key initiating event in atherogenesis is LDL-C and some other cholesterol-rich lipoproteins are causally associated with the risk of Atherosclerotic Cardiovascular Disease (ASCVD) and events like ACS.[16] The association of high LDL-C with CAD events in other studies has been established as causal based on randomized trials.[17] Our study also established strong association of LDL-C with ACS (OR, 4.98).

Many studies demonstrated that low level of serum HDL-C is an important contributor for cardiovascular events like ACS and the prevalence of low HDL-C level varies worldwide.[18] Eric Bruckert also showed the variations in prevalence of low HDL-C level in different region of the world. But there was no data against Bangladesh or even any south Asian countries.In our study the mean ± SD of HDL-C among cases was significantly lower among cases and the prevalence of low HDL-C was also higher in cases when compared to the control subjects. We found 75% subjects to be with low level of HDL-C among cases. In control group the rate was 38%, which appeared reasonable. The OR of HDL-C for ACS was calculated to be 4.89, which indicates strong association. Curtiss L. K, at al have also demonstrated that HDL-C is inversely associated with the risk of CAD.[19]

As an increase in both TC and a decrease in HDL-C increase the risk of CAD, a ratio of TC/HDL-C ratio is also important in assessing the risk for CAD. The famous Framingham Heart Study demonstrated that the TC/HDL-C ratio is also a powerful lipid predictor.[20] In our study we found similar result, 63.9% case subjects showed high TC/HDL-C ratio level and the OR was 6.27, which was very significant. Regarding LDL-C/HDL-C ratio we found similar results and was statistically significant (Table IV). OR for LDL-C/HDL-C ratio was 4.83, which indicates strong association.The study of Fernandez M L and other studies also demonstrated that LDL-C/HDL-C ratio is an efficacious tool for evaluating the risk for CAD.[21]

In this study we found serum TG (Mean ± SD) higher among the control subjects when compared to cases (ACS patients), although the difference was not significant statistically (p>0.05). Even we found the prevalence of higher TG among controls, but this increase was not significant too (p>0.05). Our findings was in contrast with other studies and M Z Islam et al which revealed that high level of serum triglyceride is associated with ACS. They also suggested that categorization of patients with ACS on the basis of TG level might be helpful for risk stratification and management.[22] In our study we could not establish any association between high TG level and ACS (OR, 0.431). Our finding regarding TG was also against the findings of the study by Wenjun Fan, et al in 2020 among American adults.[23]

L. Jia et al in their study demonstrated that a low TG/HDL-C ratio indicates the presence of primarily large, non-atherogenic LDL particles, while a high TG/HDL-C ratio indicates a larger proportion of small, dense pro-atherogenic LDL particles which is obviously atherogenic.[24] It signifies that high level of TG/HDL-C ratio is a predictor of CAD. In the context of Bangladesh Amin M R, et al.[25] in their study also showed similar findings which was consistent with the study by L. Jia et al In our study we did not found any association of high serum TG/HDL-C level with ACS (OR, 0.77). Rather the mean ± SD and prevalence of subjects with higher level of serum TG/HDL-C ratio was high among our control subjects when compared with the case group. But the difference was not significant statistically (p>0.05).

Limitation

There is a growing consensus that levels of apolipoprotein (Apo) B and the ratio of apo B/apo A-I are more accurate predictors of CVD risk, but it is still not realistic for the rural population of Bangladesh and local physicians to switch from cholesterol-based guidelines to apolipoprotein-based guidelines. Even we did not have the opportunity to probe into this issue due to logistic limitations.

Conclusion

For CAD, particularly fatal events like ACS risk assessment and planning intervention for dyslipidemia, serum TC, LDL-C, HDL-C, TC/HDL-C ratio and LDL-C ratio was proved to be good predictor and is commonly in use among the local physician for availability and cost effectiveness. Our study supported the practice and also reinforced the concept. But our study was inconsistent with the idea of estimating serum TG

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level and TG/HDL-C ratio for this purpose. We need further evaluation and large scale study to comment about the association of high serum TG and ACS, and also about the possibility of using TG/HDL-C ratio for risk assessment among the indigenous population.

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Disclosure
All the authors declared no competing interest.

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Original Article

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Association of Local Food Habit Intake with Anthropometric Measurements and Blood-Pressure of School-Going Children of Teknaf Coastal Area in Bangladesh

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Abstract

Background: Hypertension (HTN) has its origin in childhood but goes undetected unless especially looked for. Detection of hypertension in children will increase awareness and lead to preventive strategies.High dietary salt intake from food is one of a major risk factor for HTN worldwide. This study aimed to determine the nutritional status and prevalence of hypertension in school children in a coastal area in Bangladesh.

Materials and methods: This descriptive cross-sectional study included 190 school going children (Aged 6-15 years) some a primary school of Sadar of Teknaf Upazila in Cox's Bazar district of Bangladesh. Demographic, anthropometric (Weight, height, waist circumference) Blood Pressure (BP) and other information related to dietary habits and lifestyle were collected using a structured case record form.

Results: The prevalence of overweight/obesity ranged between 1.6% and 3.7%, depending upon the indicator used. 5.3% and 1.1% of the children had stage I and stage II systolic hypertension, and 8.9% and 1.1% respectively had stage I and stage II diastolic hypertension. Overall, 26 (13.7%) children were hypertensive. BP was positively correlated with anthropometric measurements such as weight, height, waist circumference and BMI which were statistically significant.

Conclusion: Though the prevalence of overweight/obesity was negligible, hypertension was relatively high among these children living in the coastal area of Bangladesh. Policymakers and researchers should pay special attention to policies to reducethis problem.

Key words: Blood pressure status; Coastal Banglades; Obesity; Overweight; School children.

Introduction

Hypertension (HTN) is one of the most common public health problems globally among adults and often begins in childhood and adolescence.[1] Bangladesh is in the process of rapid economic development and modernization with changing lifestyle factors has an increasing trend of HTN, especially among the urban population.[2] Previous pathophysiologic and epidemiologic evidence has suggested that childhood HTN is associated with essential HTN in adulthood and detrimental lifelong cardiovascular events.[3-5]

Several hereditary, behavioural, anthropometric, and socio-environmental risk factors are underlying HTN in children and adolescents.[6-8] In this regard, the attributive role of children's Body Mass Index (BMI) physical activity, dietary habits, gender and ethnicity in the development of HTN have been investigated previously. Of all these factors, obesity plays a significant role in the incidence of HTN in this age group.[9] There is abundant epidemiological evidence linking sodium intake to high blood pressure.[9] Societies with a high salt intake tend to have a significantly higher age-related increase in blood pressure. In contrast,low sodium intake is associated with lower age-related blood pressure elevations.[10] Studies in the United States have demonstrated that higher salt intake in children and adolescents is positively correlated with high systolic blood pressure and an elevated risk of pre-HTN/HTN.[11]

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From the public health perspective, reliable estimates of childhood HTN serve as the basis for adequate prevention and treatment and evidence-based health resource allocation and policymaking. Recognition of blood pressure correlates is vital in identifying groups within a population at increased risk of HTN. Therefore the early detection of HTN and its causative factors are essential to evolving measures to prevent the HTN and its complications. Keeping in view the seriousness of the problem on the one hand and the lack of knowledge about the prevalence of HTN among school children in the coastal area of Bangladesh, the present study was undertaken among the school children in Teknaf, Cox's Bazar, Bangladesh to find out the prevalence of HTN and the relationship of HTN with anthropometric variables. We hypothesized that the people of coastal areas are exposed to salt-containing food like dried fish, increasing their risk for HTN.

Materials and methods

This cross-sectional study was conducted in a primary school of Sadar of Teknaf Upazila in Cox's Bazar district of Bangladesh from January to March 2022. Permission and informed consent were obtained from the Authority of the school. Informed consent and assent were obtained from the parents or legal guardians of the participating children. The Ethical Review Committee of Rangamati Medical College approved the study protocol.

One hundred and ninety children were selected conveniently. School going children (Age 6-15 years) were included. Those who refused to participate in the interview and were ill or physically disabled were excluded.

Data regarding age, sex, physical activity level, screen time, the habit of dried fish taking, salt taking and panta rice taking, fathers occupation and family income were collected using a structured case record form. Anthropometric measurements [Height, weight, Waist Circumference (WC)] were taken following standard techniques with standardized tools. Blood pressure measurements were recorded with a pediatric mercury sphygmomanometer using an appropriately sized cuff with the subjects sitting posture. Blood pressure was recorded three times for each child and the mean was taken as the representative value. In children with higher blood pressure, measurement was repeated after taking a rest for one hour to alleviate possible anxiety and fear.

Weight for age (Underweight) weight for height (Wasting) and height for age (Stunting) were used as indicators for assessing the nutritional status. BMI was calculated by using the formula [BMI = Weight (kg)/height^2 (Meters)] according to WHO. Waist to Height Ratio (WHtR) was calculated from WC and Ht [WHtR=WC (cm)/Ht (cm)].

According to the 2000 Center for Disease Control (CDC) and prevention growth charts, each student's age and sex-specific BMI percentiles criteria were determined. The nutritional status of the students was categorized based on BMI percentiles criteria as follows: Underweight if BMI <5th percentiles, normal if 5th- <85th percentiles ,overweight if >85th- <95th percentiles and obese if BMI >95th respectively.[12,13] Abdominal obesity was considered as WHtR more than 0.5. Smoothed waist circumference centiles were used for comparison. Extremely slim <0.34, underweight 0.35 to 0.43, healthy 0.44 to 0.52, over-weight 0.53 to 0.57 (Male). Extremely slim <0.34, under-wt 0.35 to 0.41, healthy 0.42 to 0.48, over- wt 0.49 to.53.[14] Definitions of BP Categories and Stages: Normal BP<90th percentile, Elevated BP>90th percentile to <95th percentile, Stages 1 HTN>95th to <95th percentile+12mmHg, Stage 2 HTN>95th percentile+ 12mmHg.[15] Screen Time (ST): The ST behaviour of the participants was assessed through a questionnaire that asked them to report the average number of hours per day they spent watching personal computer or electronic games. According to the international recommendations, the analysis ST was categorized into less than hours (Low) and 2 hours per day or more (High). Physical Activity (PA): The information of the past week was collected. Participants reported that the weekly frequency of their leisure time PA outside the school at least 30 minutes per day was considered the main leisure-time PA definition component. For statistical analysis, each weekly frequency received a name 0-2 days per week (Mild), 3-5 days per week (Moderate) and 6-7 days (Heavy).

All statistical analyses were performed in SPSS version 23.0. Data were analyzed through Descriptive statistics (Frequency, percentage) and inferential statistics (Chi-square test and Pearson correlation coefficient).To analyze the relation of the following variables: Age, height, weight, BMI, waist circumference, the waist-to-height ratio among them and blood pressure (Systolic and

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diastolic) Pearson's correlation test was used. Sociodemographic, dietary and lifestyle-related variables were compared with the chi-square test between normotensive and hypertensive children. A p-value less than 0.05 was considered statistical significance.

Results

A total of 190 children aged 6-15 years were included in the study and 64.2% were male. Children aged 11-15 years outnumbered those aged 6-10 years. Father's occupation was fishing for around half of the children and in around two-thirds, the monthly family income was below 20,000 Tk. More than 40% of the children reported engaging in light physical activity in their daily life and 20% said spending an extended period on screen. More than half of the children reported taking dried fish 2-3 times a week and 71.6% reported taking panta rice regularly. The entire group said to take extra salt in their diet (Table I).

Table I Sociodemographic characteristics, lifestyle and food habits of the children (n=190)

Variables		Frequency	Percentage (%)
Age	6-10 years	91	47.9
	11-15 years	99	52.1
Sex	Male	122	64.2
	Female	68	35.8
Monthly family income	<10,000 Tk	71	37.4
	10,000-20,000Tk	47	24.7
	>20,000Tk	72	37.9
Father's occupation	Fishing	92	48.4
	Others	98	51.6
Physical activity	Light	79	41.6
	Moderate	90	47.4
	Heavy	21	11.1
Screen time	Low	153	80.5
	High	37	19.5
Dried fish intake	None	5	2.6
	2-3 days a week	106	55.8
	Once a week	76	40.0
	Daily	3	1.6
Taking extra salt	Yes	190	100.0
Take panta rice	Yes	136	71.6
	No	54	28.4

We have measured different anthropometric parameters to determine the prevalence of overweight/obesity in these school-going children. The prevalence of overweight/obesity ranged between 1.6% and 3.7%, depending upon the indicator used.

Table II Nutritional status of the school-going children of Teknaf coastal area, Cox's Bazar, Bangladesh (n=190)

Nutritional status		Frequency	Percentage (%)
Stunting			
	Normal	141	74.2
	Moderate	13	6.8
	Severe	36	18.9
Underweight			
	Normal	122	64.2
	Moderate	12	6.3
	Severe	53	27.9
	Overweight	3	1.6
BMI category			
	Normal	107	56.3
	Underweight	78	41.1
	Overweight/obese	5	2.6
Waist circumference			
	Normal	147	77.4
	Mild malnutrition	28	14.7
	Severe malnutrition	8	4.2
	Overweight/obese	7	3.7
Waist to height ratio			
	Normal	90	47.4
	Mild malnutrition	66	34.7
	Severe malnutrition	30	15.8
	Overweight/obese	4	2.1

Overall, out of 190 children, 26 (13.7%) were hypertensive (Table III). Respectively, 5.3% and 1.1% of the children had stage I and stage II systolic hypertension. 8.9% and 1.1% had stage I and stage II diastolic hypertension.

Table III Blood pressure status of the school-going children of Teknaf coastal area, Cox's Bazar, Bangladesh (n=190)

Variables		Frequency	Percentage (%)
	Low	82	43.2
	Normal	89	46.8
Systolic blood pressure	Elevated	7	3.7
	Stage I HTN	10	5.3
	Stage II HTN	2	1.1
	Low	55	28.9
	Normal	93	48.9
Diastolic blood pressure	Elevated	23	12.1
	Stage I HTN	17	8.9
	Stage II HTN	2	1.1
Overall blood pressure	Normotensive	164	86.3
	Hypertensive	26	13.7

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Analyzing the relationship between the variables studied, it was found that all anthropometric indicators were positively correlated (r = 0.473 to 0.834, p < 0.001), indicating collinearity between them. Age was strongly correlated with weight and height, moderately associated with BMI and waist circumference, and weekly positively correlated with systolic and diastolic blood pressure. Anthropometric variables showed weak correlations with systolic and diastolic pressures, with coefficients ranging from 0.113 to 0.22 except waist-to-height ratio.

Prevalence of hypertension was higher among older children (Aged 11-15 years) than the younger children (6-10 years) among females than the male children and among children with lower monthly family income than the children with monthly family income >20,000 Tk. Still, none of these associations reached statistical significance. Similarly, no statistical association was found between hypertension with screen time, dried fish-eating habits, physical activity and habit of taking panta rice (Table IV).

Table IV Analysis of associations between sociodemographic and lifestyle-related variables with high blood pressure among children aged 6 to 15 years living in Teknaf coastal area, Cox's Bazar, Bangladesh

Variables		Normotensive	Hypertensive	p value
Age group				
	6-10 years	80 (87.9)	11 (12.1)	0.539
	11-15 years	84 (84.8)	15 (15.2)	
Sex				
	Male	107 (87.7)	15 (12.3)	0.459
	Female	57 (83.8)	11 (16.2)	
Monthly family income				
	<10,000 Tk	61 (85.9)	10 (14.1)	0.652
	10,000-20,000Tk	39 (83.0)	8 (17.0)	
	>20,000Tk	64 (88.9)	8 (11.1)	
Father's occupation				
	Fishing	83 (90.2)	9 (9.8)	0.129
	Others	81 (82.7)	17 (17.3)	
Physical activity				
	Light	72 (91.1)	7 (8.9)	0.103
	Moderate to heavy	92 (82.9)	19 (17.1)	
Screen time				
	Low	133 (86.9)	20 (13.1)	0.618
	High	31 (83.8)	6 (16.2)	
Dried fish intake				
	2-3 days in a week	75 (89.3)	9 (10.7)	0.289
	None or less	89 (84.0)	17 (16.0)	
Taking panta rice				
	Yes	117 (86.0)	19 (14.0)	0.855
	No	47 (87.0)	7 (13.0)	

Discussion

Childhood obesity and hypertension have been studied extensively in many developed countries, but studies and data related to obesity and hypertension in children in Bangladesh are relatively scarce.[16,17] To our knowledge, this study is the first study conducted on a particular population with a unique dietary habit in Bangladesh. Fishing is one of the main occupations at the study site, and they usually consume dried fish regularly. We hypothesized that, this particular dietary habit might have some impact on their blood pressure level.

We have measured different anthropometric parameters to determine the prevalence of overweight/obesity in these school-going children. The prevalence of overweight/obesity ranged between 1.6% and 3.7%, depending upon the indicator used. In Bangladesh, the prevalence of overweight/obesity ranged from less than 1% to 17.9% based on different reference standards, with a higher percentage amongst urban children across other age groups and sexes.[16] In one study, overweight and obesity were stated as high as 23.6% and 17.9%, respectively, amongst affluent urban children.[18] On the other hand, less than 2% of rural children had been reported as overweight.[19] Our findings confirmed that malnutrition or being underweight rather than overweight/obesity ismore prevalent in rural settings of Bangladesh.

We found a prevalence of high blood pressure among school children in the present study as 13.7%.The prevalence of hypertension is more in girls (16.2%) than in boys (12.3%). A previous study among children aged 10 to 17 years in three secondary level schools in Dhaka, Bangladesh, revealed that hypertension was 1.8% (The male was 1.68% and the female was 1.99%).[20] The comparatively higher prevalence of HTN in the current study might be attributable to the dietary habit and the salinity in the drinking and cooking water.[21]

The results showed weak correlations among BMI, WC and systolic and diastolic levels. There is evidence that obesity increases the risk of pressure changes in children and adolescents and that BMI is the best anthropometric parameter to predict this risk.[22,23] In clinical practice, however, there is no consensus on the use of BMI in monitoring cardiovascular risk factors, once besides body adiposity, BMI may represent different elements of

the body composition.[24] With an increase in age, weight and height, there was a linear increase in systolic and diastolic blood pressure in the studied children.

The present study findings would help the policymakers make decisions in developing future research agendas. The evaluation of BMI and WC, in addition to nutritional assessments in children, represents a necessary action for the screening of high blood pressure in different territorial contexts.

Limitations

The study has certain limitations. Because the study had a cross-sectional design, the causal inference might not be strong between the outcome and independent variables. There might also be a recall and reporting bias in aspects of dietary and lifestyle-related variables. The sample size was small and conveniently collected, which might limit its generalizability.

Conclusion

Based on the findings of this study, it was concluded that though overweight/obesity is not frequent, hypertension exists among 6-15 years school-going children in Teknaf, Cox's Bazar, Bangladesh and it is related to increased BMI and WC.

Recommendations

Hypertension is not an uncommon problem in children. Continuous study and effort are needed to get rid of childhood obesity and hypertension to get a healthy future nation. Blood pressure measurement should be mandatory in school health programs and routine clinical practice.

Disclosure

All the authors declared no competing interest.

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Original Article

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Corticosteroid Prescribing Practices at Dermatology Outpatient Departments of Tertiary Care Hospitals : A Multicenter, Cross Sectional Study

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Abstract

Background : In dermatology, corticosteroids are the most frequently prescribed medication group. The goal of this study was to examine the prescription pattern of glucocorticoids in patients with skin diseases in Outpatient Dermatology Departments (OPD) in tertiary care hospitals.

Materials and methods : A prospective, multi-centered, cross-sectional study was undertaken in the dermatology department of government affiliated three tertiary care medical College hospitals in Chittagong, Bangladesh, from March 2021 to April 2022. A total of 450 prescriptions from Dermatology Out-patient Department patients with skin diseases were obtained and evaluated for demographics, skin diseases, and corticosteroid use patterns.

Results: Out of 450 patients, majority belonged to the age group 21-40 years (44%) and were female (56%). The most frequent indication for prescribing corticosteroids were eczema (20%) urticaria (17%) and allergic Contact dermatitis (7%) and psoriasis (7%). The commonest corticosteroids used were betamethasone (19%) and Clobetasolproprionate (17%), Deflazacort (15%). Use of topical steroid combinations with Fusidic acid and Miconazole nitrate were prevalent, (4%) and (5%), respectively. Highly potent steroids were used in 51% cases whereas only 21% were given low potency steroids.

Conclusion: Physicians prefer highly potent corticosteroids, according to this study. To improve prescribing, physicians should receive ongoing medical education and be made aware of the irrational use of steroids.Researchers and policymakers can use the baseline data acquired in these studies to enhance judicial prescribing practices.

Key words: Corticosteroids; Dermatology; Prescribing pattern.

Introduction

With the advent of topical corticosteroids, the current era of dermatotherapy began, and since then, these agents have been used in a variety of ways, with varying degrees of success. Many people suffer from typical skin disorder that affect people of all ages. Corticosteroids hassignificant role in the treatment of a various disorders, including skin problems. In topical form, it is likely to have more applications in dermatological therapy. Consultants frequently prescribe these medicines due to their potent immunosuppressive and anti-inflammatory effects. Interestingly, the similar processes that cause their beneficial anti-inflammatory characteristics are also responsible for their negative effects.[1]

Acute urticaria, pemphigus vulgaris, keloid, fixed drug eruptions, eczema, and other dermatological conditions have all been treated with them. As a result, dermatologists have risen to the top of the list of corticosteroid prescribers.[2] However, caution must be taken during the selection process as well as with regard to dose regimes. Corticosteroids are often used to treat psoriasis, as well as adult atopic dermatitis and eczema.[3] Despite their usefulness, their inappropriate and extended use in a variety

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of dermatological disorders puts a patient at risk for a variety of side effects, ranging from minor to severe.[4]

Corticosteroids' most serious side effect is immunosuppression, which might make you more susceptible to bacterial and fungal infections. The side effects of topically administered corticosteroids include adrenal suppression, rosacea induced by steroid, dermal and epidermal thinning, striae, candidiasis (Perioral), and hypertrichosis.[5] As a result, doctors should prescribe the lightest corticosteroid feasible to treat dermatological disorders.[6]

A correct diagnosis, as well as consideration of the routes of application, frequency of administration, duration of therapy, and adverse effects, are all necessary for successful treatment.[7]

Because the medicine is administered directly to the target organ, topical treatments are preferred. The dose can be easily adjusted based on the reaction.[8] Glucocorticoids (Topical and systemic) are widely used alone or in combination with other medications.[9] To acquire the best possible benefits at the minimum possible therapeutic dose for the short period at a reasonable cost and with fewer side effects, it is critical to employ the safest and smallest number of steroids feasible.[10] This will allow for more sensible medicine use. Prescribing medications is a crucial skill that must be examined and provide feedback to physician on a regular basis.Since it indicates a physician's diagnostic ability and attitude toward picking the most appropriate and cost-effective treatment. Their sensible usage, on the other hand, can help to reduce the cutaneous and systemic negative effects that corticosteroids might cause.[7] Physicians should prescribe steroid that will treat the skin related problem with the most therapeutic benefit and the fewest side effects possible.[11]

Because of the high disease prevalence and the significant economic burden of skin disease treatment, it is critical to investigate skin disease drug prescribing patterns. Taking these facts into account, current study was conducted to evaluate corticosteroid medication prescribed in dermatology to create baseline data and evaluate various elements of drug prescribing procedures.

Materials and methods

A prospective, multicenter, cross-sectional study was done in the Dermatology Department of the government affiliated private medical college of Chattogram, Bangladesh from March, 2021 to April, 2022. Data were collected from Outpatient Department of Dermatology of BGC Trust Medical College, Chattogram Maa-O-Shishu Medical College and Marine City Medical College. The protocol has been approved by the BGC Trust Medical College's Institutional Review Board.

A total of 450 prescriptions of patients with skin problems from the Dermatology Out-Patient Department who were on corticosteroids and were correctly selected by the dermatologist of the relevant medical college were obtained and analyzed. A sufficient number of data collectors were engaged to collect the data. This study included only new patients who visited to the outpatient department of dermatology, but not those who were hospitalized during their visit.The information was gathered prospectively through direct observation in a specially developed proforma that included demographic, dermatological disease, and pharmacological information. The prescriptions were examined for the following information: Diagnosed skin diseases, medicine information (Corticosteroid alone or in combination with other medicines combination, topical, systemic corticosteroids, and potency).

The obtained data was numerically coded and imported into Microsoft Excel 2010, where it was evaluated while keeping respondents' anonymity and privacy in mind. Microsoft Excel was used for statistical analysis, and data was evaluated as frequency and percentages.

Results

The study included 450 prescriptions with corticosteroid prescriptions. The majority of the patients (196/450, 44 %) were belongs to 21-40 years age group. Females comprised about 56% of the patients (252/450) (Table I)

Table I The demographic profile of the participants

Item	No of patients (n=450)	
Age	Frequency	Percentage
<20	88	19%
21-40	196	44%
41-60	105	23%
>60	61	14%
Gender		
Male	198	44%
Female	252	56%

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Table II demonstrated that the most prevalent indications for corticosteroid prescription were eczema (20%), urticaria (17%), miliarubra (8%), allergic contact dermatitis (7%), and psoriasis (7%).

Table II Dermatological conditions indicated for Corticosteroid

Dermatological Indication	Total No of patient (N=450)	
	Frequency	Percentage (%)
Eczema	86	19
Urticaria	77	17
Psoriasis	33	7
Lichen planus	12	3
Allergic Contact dermatitis	31	7
Pemphigus vulgaris	6	1
Adverse drug reaction	22	5
Seborrheic dermatitis	23	5
Keloid	7	2
Alopecia	31	7
Discoid lupus erythematosus	3	1
Planter keratoderma	10	2
Atopic dermatitis	24	5
Plurigonodularis	11	2
Plurigo simplex	17	4
Miliariarubra	26	6
Melasma	31	7

Table III demonstrated that the most commonly used corticosteroids were betamethasone (86/450, 19%), clobetasolproprionate (77/450, 17%), and deflazacort (67/450, 15%).

Table III: Corticosteroids commonly recommended in Dermatological Outpatient Department.

Corticosteroid	Total N=450	
	Frequency	Percentage (%)
Betamethasone	86	19
Clobetasolproprionate	77	17
Deflazacort	67	15
Prednisolone	49	11
Mometasonefuroate	33	7
Hydrocortisone	48	11
Flucinoloneacetonide	38	8
Triamisolone	34	8
Halobetasol	18	4

Table IV demonstrated that (356/450) 85% corticosteroids were administered alone. The most often used topical steroid combination is with Miconazole Nitrate (23/450, 5%), Fusidic acid (20/450, 4%), Gentamycin (3/450, 1%) and Clotrimazole (21/450, 5%). Over half of the steroids administered (230/450) were very potent, with just (115/450, 26%) being low potent. In terms of duration of use, 67 % (301/450) of patients had used corticosteroids for more than two weeks. Corticosteroid routes of administration were predominantly topical (67%) and parenteral (7%, 34/450).

Table IV Detailed corticosteroid prescribed

Corticosteroid	Total No =450 (%)	
	Frequency	Percentage (%)
Corticosteroid used		
Alone	356	85%
Combination	67	15%
Routes of administration		
Topical	300	67%
Oral	116	26%
Per-enteral	34	7%
Topical Corticosteroid in combination with		
Fusidic acid	20	4%
Gentamycin	3	1%
Miconazole nitrate	23	5%
Clotrimazole	21	5%
Corticosteroid Potency		
Very potent	230	51%
Moderately potent	105	23%
Low potent	115	26%
Duration		
≤ 2 weeks	149	33%
>2 weeks	301	67%

Discussion

Corticosteroids are among the widely used classes of medicine used in dermatological disease as both short-term and long-term treatments, although they are accompanied with a multitude of side effects.[11] Prescriptions should be audited on a regular basis to improve prescribing quality, decrease side effects and prescribing errors, provide criticism to physicians, andimplementation of standard treatment guideline. The study goal was to gather baseline data by assessing corticosteroid prescribing patterns and evaluating monotherapy and the use of co-administered medicines in conjunction with corticosteroids in skin diseases.

The majority (44%) of the patient in this study were between the ages of 21 to 40, 56% were female. This is similar to the study conducted by Bylappabk et al.[12]

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According to the current study, eczema (20%), urticaria (17%), miliariarubra(8%), allergic contact dermatitis (7%), and psoriasis (7%) were the most common reasons for corticosteroid prescription.

Study conducted by Bylappa et al revealed contact dermatitis (47%) and psoriasis (14%) were the common dermatological condition.[12] Similar study conducted by Divyashanthi and Manivannan revealed, psoriasis and contact dermatitis were most common dermatological disorder in which corticosteroid prescribed.[13]

In this study, most common corticosteroids prescribed were betamethasone 19%, Clobetasol proprionate 17% and Deflazacort 15%. Similar findings revealed in Javsen et al study.[14] In contrast, a study by Bylappaet al found clobetasol to be the most widely utilized corticosteroid. Similar to this study, Haiya J S. et al found that fluorinated glucocorticoids Betamethasone and Clobetasol were the most regularly prescribed, whereas non-fluorinated glucocorticoids Prednisolone and Mometasone were the least usually administered.[15] Fluorinated steroids have a higher permeability and produce systemic adverse effects due to their higher lipid solubility. In this study, corticosteroid mainly prescribed alone (85%). Most commonly used topical steroid combination with Fusidic acid 4%, Gentamycin 1%, and Miconazole nitrate 5% and with Clotrimazole 5%. Similarly to the current study, Nerurkar RP et al found that the 88% of prescribed corticosteroids were topical as single drugs, while only 12% were recommend in combinations with other topical medicine such as Salicylic acid, Fusidic acid and Clotrimazole.[16] Various studies conducted in various nations have also found comparable results to the current study.[12,17] Only if the lesion was limited to a tiny area of skin were topical steroid fixed dose combinations are preferred. A short course of an appropriate oral anti-infective was chosen in severe instances.[15]

As a result, the topical route was proven to be the most chosen route for medication administration (62 %) in the current investigation. When compared to other studies, one consistent conclusion was that topical formulations were widely utilized in dermatology.[10,18-19] The principal advantage of adopting the topical route for steroid administration was that it had the fewest side effects, unless systemic injection was required.[3,20] Unless the disease requires long-term treatment, oral formulations should be administered in a short period with reducing doses.[21]

According to the results of the current study, nearly 51% of the steroids administered were very potent, while just 26% were low potent. In terms of duration of use, 67 % had been on corticosteroids for more than two weeks. According to a study by Bhagunde et al, high potency medications were prescribed in 66% of encounters, whereas low/mild potency corticosteroids were prescribed in 11% of encounters.[7] Other studies have shown similar results.[15,22] Long-term and extreme application may result in hypothalamus pituitary adrenal axis suppression as well as local side effects.[22,23] When at all possible, the use of highly potent corticosteroids should be restricted.

Low potency corticosteroids have been considered to be the best for long-term use.[24,25] High potency corticosteroids have been recommended over low and moderately potent corticosteroids in specific situations, such as atopic dermatitis.[26]

Limitation

This study had few drawbacks. Patients were not followed up on in this cross-sectional trial to assess the efficacy and safety of corticosteroids. Only Dermatological Out-patient Department were included in the study. Inpatients and emergency situations all required to be investigated.

Conclusion

More emphasis should be placed on rational and comprehensive corticosteroids prescribing for skin diseases. The baseline data generated by these studies can be used by researchers and policymakers to enhance prescribing practices. Continuing medical education is also critical for professional physicians to put it into action and ensure success. This will help to improve corticosteroid prescribing by providing education during consultations.

Recommendation

Future studies will be able to assess this. Maintaining a balance between judicious use and frequent misuse of corticosteroids, as well as physician attention and patient education during consultation is crucial.

Disclosure

All the authors declared no competing interest.

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Original Article

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Study of Metabolic Syndrome in Menopausal Women

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Abstract

Background: Metabolic Syndrome (MetS) is a cluster of risk factors for future development of type 2 diabetes mellitus and cardiovascular diseases. Menopause is associated with an increase in metabolic syndrome prevalence. This study was undertaken to determine the prevalence of metabolic syndrome and components in postmenopausal women. The aim was to evaluate the prevalence of MetS among postmenopausal women.

Materials and methods: This cross-sectional, observational study was carried out in the Department of Obstetrics and Gynecology, Sir Salimullah Medical College and Mitford Hospital between December 2016 and November 2017. A total of 201 menopausal women attending Out-Patient Department were enrolled in this study. Postmenopausal women were considered to have metabolic syndrome if they had any three or more of components according to the ATP III Criteria and categorized as group I. Those subjects who did not fulfill the ATP III criteria were categorized as group II. Anthropometric indices, blood pressure, fasting blood glucose and lipid profile were measured.

Results:
The mean age was 56.99±8.61 years in group I and 58.15±7.08 years in group II. Mean age of menopause was 48.51±1.7 years in group I and 49.34±1.71 years in group II. 41.3% subjects were overweight and 7.3 % were obese. The difference was statistically significant ($p<0.05$) between two groups. The duration of menopause was almost alike between two groups.
The overall prevalence of metabolic syndrome was 54.2% among menopausal women. The difference of waist circumference, hypertension, Fasting Blood Sugarand Triglycerideswere statistically significant between two groups. Body mass index and waist circumference had a positive correlation with different components of metabolic syndrome except HDL.

Conclusions: Metabolic Syndrome was highly prevalent among Bangladeshi menopausal women. The presence of Mets had a strong association with impaired FBG followed by central obesity, elevated TG, hypertension and low HDL.

Key words : Hormon; Menopausal women; Metabolic syndrom; Testosterone.

Introduction

Menopause is a natural biological process which is a significant hallmark for women because during this transition time several changes occur in the body secondarily due to diminished ovarian function. Menopause in the life of woman is an inevitable reality. During this period, she underwent numerous metabolic and hormonal changes. Changing hormonal milieu with declining estrogen and alteration of its ratio with testosterone has been implicated as a causal factor for the emergence of Metabolic Syndrome (MetS) at menopausal transition.[1] Besides hormonal changes, aging also plays role in clustering of cardio-metabolic risk factors.[2] Hence, there is a debate as to whether the increased incidence of MetS is due to aging alone or due to menopausal transitional changes. There is increased risk of MetS and its components after menopause and is recognized as a public health problem.[3]

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Metabolic syndrome or syndrome X has been studied since the early 1980sand Syndrome X was initially coined by Reaven in 1988.[4] It is also known as the insulin resistance syndrome, the central obesity syndrome and the deadly quartet. Many definitions have been scheduled to evaluate this syndrome and the commonly used definition is NCEP-ATP III -2005 definition.[5] It comprises of the following components: hyperglycemia or insulin resistance, dyslipidemia, central obesity and hypertension. All these increase the risk for future development of Type 2 diabetes mellitus and Cardiovascular Diseases (CVD) by three to five fold and two to threefold, respectively.[6] Among the above components, obesity is considered as the major contributor of cardiac dysfunction in postmenopausal women. It is estimated that half of all cardiovascular events in women is related to metabolic syndrome.[7] Different studies show that MetS and CVD are more common in women above 55 years of age with significant increase in individual risk factors in the postmenopausal phase.[8] Woman enjoy better cardiac health than men due to estrogen which is a cardio protective factors. The risk of Coronary Artery Disease (CAD) that is caused by Metabolic syndrome seems to be particularly high among female after menopause.

Many metabolic changes among post-menopausal women are related to decrease estrogen secretion and consequently accumulation of abdominal fat. To decrease the risk of MetS and CVD in post-menopausal women, lifestyle modification to control weight, lipid profile, blood pressure and blood glucose is recommended. Besides the abdominal obesity, alteration in lipid profile and insulin resistance are two important factors that are influenced by decreased hormone secretion. A striking increase in the number of people with the MetS has taken place worldwide not only in developed countries but also in developing countries considerably due to changing environment and lifestyle.[9] It is estimated that about 20–25% of the world's population have metabolic syndrome and they are three times more likely to die from heart attack or stroke in comparison topeople without the syndrome.[10] Some studies showed the prevalence of metabolic syndrome among postmenopausal women in China, India, and Brazil to be 33.5%, 55%, and 34.7%, respectively.[11,12,13] Among Asian countries in China the prevalence of MetS were 40.28% to 49.66% in pre and post-menopausal women, respectively, after adjusting for age.[11] According to many studies it raises the risk of myocardial infarction 2.5-fold, and causes a 1.5-fold increase in the total mortality rate and a 2-fold increase of the number of cardiovascular events.[14] Differences in genetic background, diet, levels of physical activity, age and sex structure all influence the prevalence of both metabolic syndrome and its components.

Although the prevalence of MetS among postmenopausal is lower in Asian countries, it is observed that its prevalence is increasing due to the combined effect of rising aging population and obesity. Evidence suggests that metabolic syndrome is higher among postmenopausal women, irrespective of diagnostic criteria used. Therefore, it is very important to set up a study on postmenopausal women with a risk of metabolic syndrome.

As there are limited studies on the prevalence of metabolic syndrome among postmenopausal women in our country, this study is undertaken with an aim to identify the prevalence of MetS and frequency of its different components among postmenopausal women to screen who have risk of CVD, type-2 DM in order to reduce the morbidity and mortality from these disease. The aim of the study is to evaluate the prevalence of MetS and frequency of its different components among postmenopausal women.

Materials and methods

Thiscross sectional observational study was conducted in the department of Obstetrics and Gynecology, Sir Salimullah Medical college and Mitford Hospital (SSMC & MH), Dhaka between1st December 2016 and 30th November 2017. Ethical clearance was taken from the institutional review board of Sir Salimullah Medical College. A total of two hundred one postmenopausal women above 45 years of age having menopause for consecutive 12 months who attended Out-patient Department of Gynecology, SSMC & MH were enrolled for the study. Women having premature menopause induced by surgery, chemotherapy or radiation, women who were on hormone replacement therapy, smoker or tobacco user and having coexistence of any other serious illness other than metabolic syndrome were excluded from this study.

Purposive sampling was done according to the availability of the participants who had voluntarily joined this study. After selecting the patients by inclusion criteria, purpose and procedure of study

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was discussed with the patients. Then a written informed consent was obtained from each patient. All study participants were subjected to detailed history, clinical examination followed by biochemical investigations. Demographic information was collected by a questionnaire. The body weight was measured in bare foot. Height of the subjects were measured barefooted in standing position with meter scales. Body mass index was determined by measuring weight in kg divided by the square of height in meter.Waist circumference was measured at the point halfway between the lower border of ribs and the iliac crest in a horizontal plane in erect posture during minimal respiration. Systolic and diastolic blood pressure was measured on right hand in sitting position. Venous blood sample was collected from the subjects in morning having 8–12 hours overnight fasting. The samples were centrifuged for 10 minutes at 3000 rpm. The serum was used for estimating fasting blood glucose, triglycerides, total cholesterol, LDL and HDL concentrations using spectrophotometer techniques in the hospital department of Biochemistry and Clinical Pathology. Postmenopausal women were considered to have metabolic syndrome if they had any three or more of components according to the ATP III Criteria and categorized as group I. Those subjects who did not fulfill the ATP III criteria were categorized as group II. Statistical analyses of the results were performed by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-20). The mean values were calculated for continuous variables. The quantitative observations were indicated by frequencies and percentages. Chi-Square test was used to analyze the categorical variables, shown with cross tabulation. Student t-test and Pearson's Correlation Co-efficient test were used for continuous variables. p values <0.05 was considered as statistically significant.

Results

There was no significant difference between group I and group II regarding age, socioeconomic status and education. The mean age in group I was (56.99±8.61) years and in Group II was (58.15±7.08) years.It was observed that in group I mean age of menopause was 48.51 years and in group II 49.34 years. The difference of age of menopause was statistically significant (p<0.05) between two groups. It was observed that in group I 32.2% menopausal women were grand multipara which was statistically significant (p<0.05) when compared with group II.

Table I BMI status of the study subjects (n=201)

BMI (kg/m^2)	Group-I (n=109)		Group-II (n=92)		p value
	n	%	n	%	
18.5-24.9 (Normal)	56	51.4	86	93.5	0.001^s
25-29.9 (Over weight)	45	41.3	6	6.5	
≥30 (Obese)	8	7.3	0	0.0	

Table I shows a higher prevalence of overweight and obesity in group I than that in group II (48.6% vs 6.5%) and it was statistically significant (p<0.001).

Table II Distribution of the study subjects by MetS components (n=201)

MetS components	Group-I (n=109)		Group-II (n=92)		95% CI OR (Lower-Upper)	p value
	n	%	n	%		
HDL-c (mg/dl)						
<50 (abnormal)	107	98.2	87	94.6	3.07 (0.51-23.50)	0.166^{ns}
≥ 50 (normal)	2	1.8	5	5.4		
FBG (mmol/l)						
5.6	91	83.5	7	7.6	61.39(22.7-100)	0.001^s
<5.6	18	16.5	85	92.4		
TG (mg/dl)						
≥150	79	72.5	7	7.6	31.98 (12.49-85.53)	0.001^s
<150	30	27.5	85	92.4		
Hypertension						
Present	73	67.0	11	12.0	14.93 (6.72-33.92)	0.001^s
Absent	36	33.0	81	88.0		
WC(cm)						
≥88	73	67.0	4	4.3	44.61 (14.24-100)	0.001^s
<88	36	33.0	88	95.7		

Table II shows MetS components of the study subjects. It was observed that in group I low HDL-c (98.2%) was the most common component of Metabolic syndrome. Next in order of frequency are impaired FBG (83.5%), elevated serum TG (72.5%), hypertension (67.0%) and waist circumference (67%). The difference inimpaired FBG, raised serum TG, hypertension and waist circumference were statistically significant (p<0.05) between two groups.

Table III Distribution of study subjects by number of Mets components (n=201)

MetS components	Number	Percentage (%)
Five	28	13.9
Four	45	22.4
Three	36	17.9
Two	24	11.9
One	68	33.8

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Table III shows distribution of study subjects by number of Mets components. It was observed that among postmenopausal women 33.8% had one component of metabolic syndrome while 11.9%, 17.9%, 22.4%, 13.9% had two, three, four, and five components respectively.

Table IV Correlations between waist circumference (cm) with other components of Mets (n=201)

Other components of Mets	Waist circumference (cm) Correlation co-efficient (r value)	p value
FBG (mmol/L)	0.393	0.001[s]
TG (mg/dl)	0.388	0.001[s]
HTN (mm Hg)	0.939	0.001[s]
HDL-c (mg/dl)	-0.034	0.635[ns]

Table IV shows Waist circumference had positive correlation with FBG, TG and HTN but negative correlation with HDL-c. The correlation between Waist circumference with other components of Mets except HDL-c were statistically significant ($p<0.05$).

BMI had positive correlation with FBG, TG, HTN and Waist circumference but negative correlation with HDL-c. The correlation between BMI with different components of Mets except HDL-c were statistically significant ($p<0.05$).

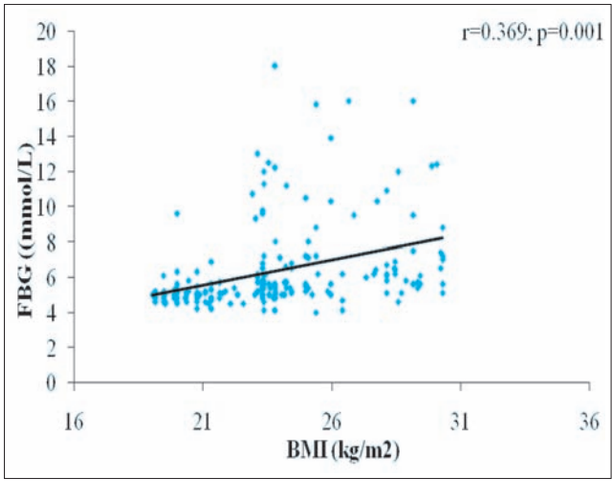

Figure 1 Scatter diagram showing significant positive correlation between BMI with FBG

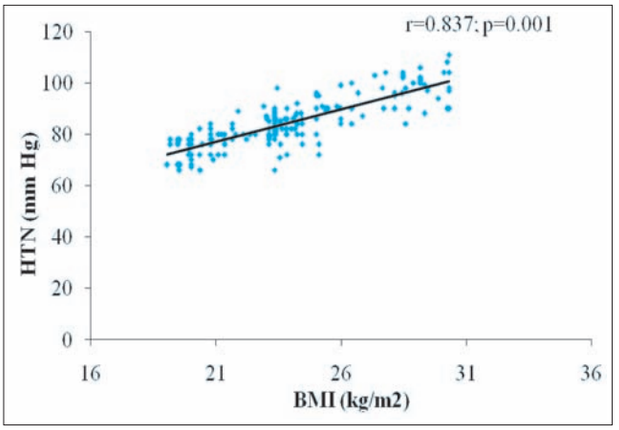

Figure 2 Scatter diagram showing significant positive correlation between BMI with HTN

Discussion

From the study result it was found that the prevalence of MetS in postmenopausal women was 54.2%. It was consistent with the study conducted bySapkota and colleagues in Nepal, the prevalence was 57.8%.[15] In Bangladesh another study conducted by Jahan and colleagues show prevalence was 50% (95% CI=39.9% - 60.1%).[16] In India, a prevalence of 55% was reported by the study conducted by Pandey and colleagues.[12]

In this study, it was found that in group I the mean age of the respondents was 56.99±8.61 years and in group II 58.15±7.08 years, which was quite similar with the study conducted by Jahan and colleagues in Bangladesh.[17] Patients belonging to low socioeconomic status was 90.8% in group I while 92.4% in group II. This finding was similar with the study conducted by Jahan and colleagues.[17] In this current study, 89.9% subjects belonged to age ≤50 years in group I and 84.8% in group II while attaining menopause. Mean age of menopause was 48.51±1.7 years in group I and 49.34±1.71 years in group II. The mean age of menopause was statistically significant ($p<0.05$) between two groups. In a study conducted by Hussain and colleagues mean age of menopause were 49.8±4.23 years, which was quite similar with the present study result.[18] In this present study, patients having ≥ 5 para was 32.2% in group I and was 17.4%. in group II. Parity ≥5 was significantly ($p<0.05$) higher in group I. Akter and colleagues did a study which showed higher was the parity more was risk of having Mets.[19] In this current study, in group I 41.3% subjects and in group II 6.5% subjects belonged to BMI 25-29.9 kg/m^2. Overweight and obese were significantly ($p<0.05$)

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higher in group I. Similar observations regarding the BMI was also observed in studies conducted by Jahan, Akter.[17,19] In this current study, it was observed that among the 5 components of MetS all components were presents in group I which was statistically significant except HDL-c when compared with group II. The difference of waist circumference, hypertension, FBG and TG were statistically significant ($p<0.05$) between two groups. This study result showed that the presence of MetS had a stronger association with impaired FBG ≥5.6 mmol/l odds ratio 61.39 (95% CI=22.7% - 100%) followed by waist circumference ≥88 cm having odds ratio 44.61 (95% CI= 14.24%- 100.0%), high TG odds ratio 31.98 (95% CI=12.49% - 85.53%), presence of HTN odds ratio 14.93 (95% CI=6.72% - 33.92%) and low HDL-c having odds ratio 3.07 (95% CI=0.51% - 23.50%).

In our country Jahan and Billah reported that the prevalence of MetS had largely determined by obesity, high diastolic blood pressure high TG and diabetic status.[16] The investigators also mentioned that low HDL-c prevalence was highest (96.9%, 95% CI=91.0 - 99.0) among the components of MetS followed by TG (51.6% 95% CI= 41.4 - 61.6), HTN (32.8%, 95% CI= 24.0 - 43.0). MetS respondents had significantly ($p<0.05$) high waist circumference. A study conducted by Shihuaand colleagues in china also found hypertension and high TG to be associated with Mets.[20] In this study it was observed that postmenopausal women had respectively 17.9%, 22.4% and 13.9% of three, four and five abnormal metabolic syndrome components.100% postmenopausal women have at least one metabolic syndrome risk.

In present study waist circumference and BMI had positive correlation with FBG, TG and HTN but negative correlation with HDL-c. The correlation between Waist circumference and BMI with different components of Mets except HDL-c were statistically significant ($p<0.05$). Estrogen secretion is decreased among postmenopausal women depending on metabolic alterations and resulting agglomeration of abdominal fat.

Limitations

The present study was conducted within a short period of time. As a cross-sectional study, it is not possible to determine with certainty the temporal relationship between menopause and the onset of the reported diseases. The study population was selected from one selected hospital, so that the results of the study may not be reflect the exact picture of the country. Small sample size with purposive sampling was also a limitation of the present study.

Conclusion

The study findings suggested high prevalence of Metabolic Syndrome in postmenopausal women. Overweight and obesity were significantly higher in postmenopausal women having metabolic syndrome. Low HDL cholesterol was more common in menopausal women followed by elevated fasting blood glucose, TG, hypertension and waist circumference. The presence of Metabolic Syndrome had a stronger association with impaired FBG followed by waist circumference, high TG and HTN. Waist circumference and BMI had positive correlation with different components of Mets except HDL-c were statistically significant.

Disclosure

All the authors declared no competing interest.

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Case Report

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Mondor's Disease and Role of Diagnostic Musculoskeletal Ultrasound

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Abstract

Background: Mondor's Disease (MD) a superficial thrombophlebitis of the thoraco-epigastric veins and their confluents is rarely reported in the literature. The superior epigastric vein is the most affected vessel but involvement of the other vessels like dorsal vein of penis have also been described. There is no universal consensus on treatment in the literature but most authors suggest symptomatic treatment with Non-Steroid Anti-Inflammatory Drugs (NSAIDs). The purpose of the study to see the ultrasound appearance of clinically suspected Mondor's disease and follow up the case to observe its natural course.

Case report : We report the case of a garment factory worker who presented with left hypochondriac palpable cord like structure. There is no history of pain, trauma or other systemic diseases. As it is not subsiding he got panic and ask the primary physician to exclude any serious disease. The primary differential was foreign body reaction. We scanned him with HF ultrasound and found the changes are compatible with Mondor's disease.

Discussion : MD though a rare entity but can involve different body part like Breast, Penis, Chest and abdominal wall and presented with pain mimicking other pathology of that respective area and warrants many investigations to exclude potential serious pathology. But HF MSKUS here can play a great role by diagnosing the pathology easily.

Conclusion : Ultrasonography, especially HF MSKUS is readily available now and practiced by different specialist Like PMR and even within the emergency department and we suggest its use in aiding diagnosis of superficial thrombophlebitis such as Mondor's disease.

Key words: Color-Doppler; Mondor's disease; Ultrasonography; Vein thrombosis.

Introduction

Mondor's Disease first described by Henri Mondor as superficial thrombophlebitis in the thoraco abdominal wall.[1] It is an uncommon disease. The other site of involvement noted on the breast, penis, groin, axilla, upper limb, abdominal wall and cervical region.[1] MD has three classifications. Type 1 involves the chest wall, type 2 involves other venous districts, mainly dorsal veins of the penis and type 3 occurs after breast surgery.[2] It is rarely reported and is not diagnosed early because many patients do not seek treatment because it is a benign and self-limiting disorder and sometimes painless.[1] There is no general clinical presentation of the disease, but most reported cases have a sucutaneous, tender, cord-like structure, where overlain skin is freely mobile, lacking inflammatory symptoms.[1,3] Symptoms typically last from 6 to 8 weeks before complete resolution, but in some reported cases it can last up to 6 months.[4,2] There has been no evidence report of any long term sequelae as it is a benign self-limiting condition.[4] Diagnosis of Mondor disease is clinical, based on history and physical examination.[4] However ultrasound and Doppler

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ultrasonography may be necessary not only to confirm MD, but also to exclude other differential diagnoses such as presence of an underlying compressing mass or muscle tear etc.[1] The purpose of the study to see the ultrasound appearance of clinically suspected Mondor's disease and follow up the case to observe its natural course.

Case Presentation

On 7th November 2020, A 42 year-old previously healthy male garment factory worker presented to the Physical Medicine Center, Chattogram complaining of a palpable structure over left lateral chest wall and corresponding part of abdominal wall for 2 weeks. He has no pain and swelling. There is no history of trauma, systemic features of disease like fever or wearing lumbar corset or other orthosis that may compress the area. It gradually became more palpable and he could feel the tethered structure in that area easily. It made him panic and he visited the 2nd author to exclude any serious pathology. Upon presentation, the patient was normotensive (130/80) with a normal heart (80) and respiratory (14) rate and was afebrile (36.8 C). Physical examination revealed no abnormality. The cord like structure was not evident on inspection but can be felt on superficiall palpation. It can be demonstrated by putting pressure along the long axis of the cord (Figure 1).

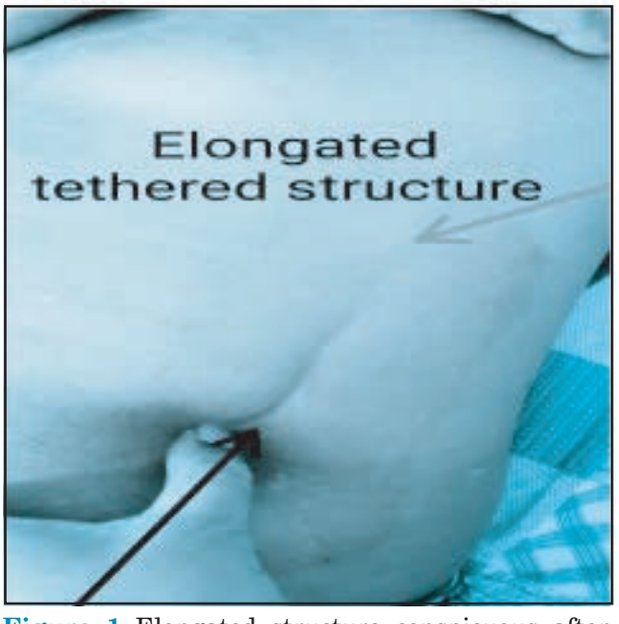

Figure 1 Elongated structure conspicuous after tethering the skin over lateral abdominal wall. The structure is clearly visible within 2 arrows

The primary physician's differentials were i) Foreign body reaction ii) Benign skin tumour iii) Thrombophlebitis 4. Resolved case of erythema nodosum. He advised the necessary investigation to exclude any systemic pathology and it was within normal limit. Then he referred the patient to 1st author to have an ultrasound scan of that area.

Ultrasound of the chest wall and adjoing area performed by using a Philips affinity 30 machine, with a high frequency linear probe (L12-5) on the Superfical Muskulokeletal setting, demonstrated a noncompressible, left lateral superficial vein in that area (Figures 2 and 3). The arteries and soft tissues of that area were otherwise unremarkable. On ultrasound, it appeared as a hypoechoic tubular structure with some areas of narrowing, giving a somewhat beaded appearance. There was no internal echoes present that representing clot. No flow is present on color or spectral Doppler studies and in this case.

Figure 2 Short axis view of the structure (The arrow indicate the hypoechoic structure)

Figure 3 Long axis view of the structure with in the arrows. Thin hyperechoic wall with hypoechoic internal content (Old clot) can be seen

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We assured the patient that this is a benign condition and will be healed with time. Conservative management with hot moist compression was advised with follow-up to ensure the resolution of symptoms, which was expected to take up to 4 weeks. The patient was visited after 4 weeks and reported that his symptoms had resolved. We offered him no medication and no massage or other physical agent. We just let it be resolved by itself (Total time of study : From 7th November 2020 to 6th November 2021).

Discussion

Pathophysiology of MD is remains obscure but in some literature some factors are related to MD. These are local trauma, including repetition injury with the edge of tight brace, strenuous exercise, or direct injury like surgery.[5] Other causes include direct vein damage, blood stasis or extrinsic pressure on the veins. This process triggers an inflammatory response that includes pain, swelling and redness resulting in visible and indurated cord like veins. Re-cannulization can take four to eight weeks and most patients enjoying a complete resolution of symptoms.[6] Mondor's disease have been reported after mammoplasty, mastectomy and breast-conserving surgery for breast cancer and after core needle biopsy.[7] Though some authors have highlighted an association between the Mondor cord as a sign of underlying breast pathology and recommend ruling out breast cancer through appropriate imaging before expectant management, however, no direct correlation has been proven. In elderly patients without an obvious triggering factor, it is important to exclude an underlying malignancy (Especially in classic and penile syndrome) or other prothrombotic state.[4] For our patient, we retained that the repeated trauma, associated with the occupation, were the likely trigger for this condition.

No universal consensus exists about the optimal therapeutic management of MD, as several treatment options are acceptable [8]. Most patients require symptomatic treatment with anti-inflammatory drugs (NSAIDs).[3] Studies have showed that the administration of antiplatelet agents and heparin did not help to heal or to prevent additional local thrombosis.[1] In case of severe pain, local infiltration of anesthetic agents may help to resolve the symptoms.[9] When this treatment is not sufficient or in case of recurrent disease, surgery in the form of thrombectomy or superficial vein resection may be necessary.[1] For our patient we did not offer any medication as he has no symptom other than anxiety. With proper explanation he was satisfied. After 4 weeks follow up he presented with resolution of the problem along with the anxiety related to this. However there isevidence that patients who has inguinal Mondor disease are predisposed to experience recurrent episodes.[2]

Ultrasound has been shown to have consistent features in Mondor's disease, including noncompressible veins and lack of venous color Doppler flow.[1,3] A chronic thrombus has a smaller lumen size and increased echogenicity (i.e Hyperechoic).[10] In this particular case, the vessel was noncompressible, lacked venous color Doppler flow, had a normal size lumen, and had decreased echogenicity (i.e Hypoechoic). So it is acute. These described findings are also found with Mondor's disease in other areas, such as the breast.[1,11] There may be weak flow and high resistance in nearby arteries using pulsed Doppler in examining Mondor's disease of the penis.[12]

Further imaging studies have been used for the diagnosis of superficial thrombophlebitis. For the cases of the disease occurring in the breast, mammography is commonly used, showing densities along the affected area.[1,13] MRI angiography can also demonstrate thrombus and be used to evaluate extension of the thrombus, even into areas difficult or impossible to image with ultrasound or presence of hematoma; however, MRI is expensive and adds little to the clinical management of the disease[14] Belleflamme et al have suggested ultrasound be the confirmatory imaging modality of choice.[15] Proper identification of Mondor's disease assisted by ultrasonography allows for proper management of the disease. Patients diagnosed in the emergency department or any other setting should be given proper follow-up, which may include testing for protein C and protein S or antithrombin III deficiencies, evaluation for other thrombophilic conditions and possible search for occult malignancy.[3,15,1]

Conclusion

Ultrasound has been shown to be an effective means of supporting the diagnosis of Mondor's disease. Findings on ultrasound are a noncompressible vein without flow and absence of other pathology such as foreign body, muscle tear etc. Its use has been

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validated and accepted by many specialties. With the advent of technology now HF MSKUS available and Cheap.The Musculoskeletal Physician and other sonographers who have familiarity with the sonographic findings are able to quickly diagnose this rare condition at bedside with relative certainty. Mondor's disease is usually a benign and self-limiting entity, but in a small proportion of cases, it is associated with breast malignancy. So sonographers should be aware of this entity and carefully distinguish malignancy from benign conditions.

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Disclosure

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Case Report

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An Unusual Case of A Left Sided Incarcerated Amyand's Hernia with Cecum and Terminal Ileum

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Abstract

Background: Amyand's hernia, is described as the presence of a normal or pathological vermiform appendix inside the inguinal hernial sac, which is a rare clinical entity. The purpose of the study to disseminated our knowledge and experience of clinical characteristics presentation and management about the mentioned case report for thed readers as future references.

Case Presentation: A 18 months old boy weigthing 9 kg came on 10.01.2022 to the Emergency Department of Chattogram International Medical College Hospital (CIMCH) Chattogram with a history of irreducible swelling on inguinoscrotal region for 2 days with tenderness for last 6 hours. There was no specific sign of intestinal obstruction, dehydration or infection. Clinical diagnosis was left-sided incarcerated inguinal hernia and prepared for inguinal exploration. Peroperatively, we identified the cecum, vermiform appendix and terminal ileum in the left scrotal sac. After opening the sac, hernial contents was completely reduced through the defect to the abdominal cavity & herniotomy was performed, appendectomy was not performed as the appendix was not inflamed. Post operative period was uneventful and baby was discharged on 2nd post-operative day with normal bowel habit.

Conclusion: Left sided Amyand's hernia diagnosis is challenging due to it's rarity. Surgery is often diagnostic as well as therapeutic. A pediatric surgeon should have a suspicion of Amyand's hernia in inguinal region irrespective of normal or complicated hernia.

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Key words: Amyand's hernia; Appendectomy; Children; Inguinal hernia; Mobile cecum.

Introduction

Congenital inguinal hernia is a common problem in children and it is estimated as 75% of all hernias.[1,2] Most frequently a piece of omentum to small or large intestine is the content of hernial sac but sometimes ovary, fallopian tube, urinary bladder, intestinal diverticulum, Meckel's diverticulum and very rarely vermiform appendix may be present.[3-5] Inguinal hernia containing vermiform appendix is called Amyand's hernia.[6,7] The prevalence of Amyand's hernia is higher in pediatric age group approximately 1 % where it is 0.4–0.6 % among all cases of inguinal hernias in general population.[7] It occurs commonly in male child, as indirect right inguinal hernia but rarely it may occur in left side, due to congenital anomalies like intestinal malrotation, situs inversus and mobile cecum.[8-10] Amyand's hernia is difficult to diagnose preoperatively due to indistinct clinical features, it may present as normal or complicated inguinal hernia like incarceration, strangulation or acute scrotum.[10]

Case Report

A 18 months old boy weighting 9 kg was admitted on 10th January 2022 at Chattogram International Medical College Hospital with 2 days history of a irreducible swelling in left inguinoscrotal region with tenderness for last 6 hours. Bowel moved 2 days back, no history of vomiting. Mother also gave history of recurrent swelling in left inguinoscrotal region since birth which was diagnosed as left sided complete indirect inguinal hernia and surgical repair was offered on elective basis but they delay. On examination baby was irritable and his vitals were within normal limit, abdomen was soft, not distended. Local examination revealed a firm, mildly tender, irreducible swelling on inguinoscrotal region (Fig 1). It was planned for exploration through inguinal skin crease line incision under general anesthesia. After opening of

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hernial sac, cecum, terminal ileum and vermiform appendix was found (Fig 2). The trapped cecum, terminal ileum, vermiform appendix were viable and the vermiform appendix was not inflamed. Hernial contents were completely reduced through the defect to the abdominal cavity and herniotomy was performed. Appendectomy not done as it was normal. Postoperative period was uneventful and baby was discharged on second post-operative day with normal vitals and normal bowel habit.

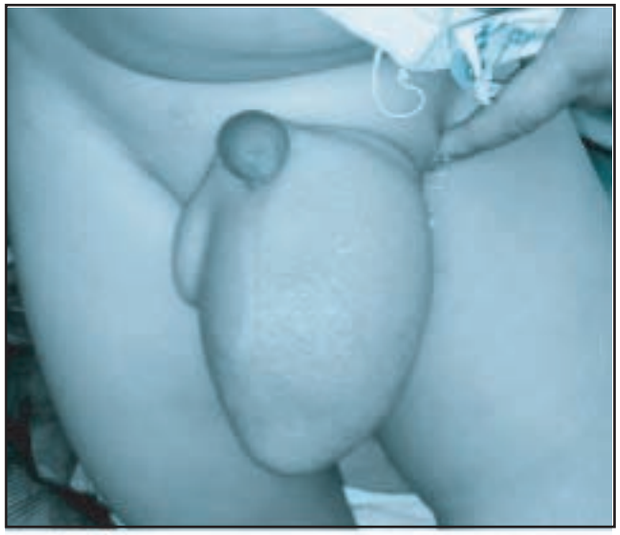

Figure 1 preoperative photograph of incarcerated left inguinal hernia

Figure 2 peroperative photograph showing the content of hernia to be cecum, terminal ileum

Discussion

Amyand's hernia was first described by a French surgeon Claudius Amyand.[11] The incidence is three times more in children than adult due to patency of the processus vaginalis and very much rare in left side.[12,13] Appendix in an Amyand's hernia may be incarcerated but remain healthy or it may be inflamed, perforated which is rarely seen in pediatric age group.[10,9] Inguinal orifice is larger in children, and thus the vermiform appendix can easily herniate without incarceration. The lumen of vermiform appendix is relatively wider in neonate, so it is difficult to blocked by a foreign body that may lead to appendicitis.[14] Although USG, CT scan may be helpful in preoperative diagnosis of inguinal hernia but it is not routinely practiced after the clinical diagnosis.[15]. The preoperative diagnosis of left sided Amyand's hernia is very difficult due to indistinct clinical features and rarity of the disease, so diagnosis is always possible.[16,17] Treatment of Amyand's hernia depends on the condition of vermiform appendix which could be either normal or complicated.[18] There are some controversy regarding appendectomy in Amyand's hernia, some author advocate appendectomy even in normal vermiform appendix to avoid future complications, like secondary appendicitis due to manipulation during surgery or atypical presentation of appendicitis due to mobile cecum.[19,9,20] While other author advocate appendectomy only in inflammation, because vermiform appendix is an organ of immune system, appendectomy may also increase the risk of surgical site infection, it may be useful in future for Malone anterograde colonic enema.[21,12,7,22]

Conclusion

Amyand's hernia is rare where left sided incarcerated Amyand's hernia with cecum and terminal ileum is rarer and clinical diagnosis is challenging. Surgery is often diagnostic as well as therapeutic. A pediatric surgeon should have a suspicion of Amyand's hernia in inguinal region irrespective of normal or complicated hernia.

Disclosure

Both the authors declared no competing interest.

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