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- Authors should submit electronic version (Microsoft word doc) of the manuscript to the editor via e-mail **(editor.jmmc@yahoo.com)** and two hard copies of manuscript with cover letter signed by all authors of the paper
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Types of Manuscript

The following categories of manuscript are accepted for this journal:

a. Original Research Articles
b. Systematic Review or Meta Analysis
c. Review Article
d. Short communications
e. Case reports
f. Letter to Editor

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The guidelines listed below should be followed where appropriate. Please use these guidelines to structure your article. Completed applicable checklists, structured abstracts and flow diagrams should be uploaded with your submission; these will be published alongside the final version of your paper.

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- STARD (www.stard-statement.org/) for reporting of diagnostic accuracy studies)
- STROBE (http://www.strobe-statement.org/) for reporting of observational studies in epidemiology

a) Checklist for cohort, case-control, and cross-sectional studies (combined)
b) Checklist for cohort studies
c) Checklist for case-control studies
d) Checklist for cross-sectional studies

- PRISMA (www.prisma-statement.org/index.htm) for reporting of systematic reviews
- MOOSE for reporting of meta-analyses of observational studies
- STREGA (www.medicine.uottawa.ca/public-health-genomics/web/eng/strega.html) for reporting of gene-disease association studies.
- The Equator Network (Enhancing the Quality and Transparency Of health Research) provides a comprehensive list of reporting guidelines. The web site of it is http://www.equator-network.org/resource-centre/library of-health-research -reporting/library/

Original Research Articles:

It should be arranged into the following sections:

1. Title
2. Author(s)
3. Address

4. Structured Abstract
5. Key words
6. Introduction
7. Methodology
8. Results
9. Discussion
10. Conclusion
11. Acknowledgement
12. References
13. Tables
14. Figures

Title page

It should be paginated as page 1 of the paper. It should carry the title, authors' names and their affiliations, running title, address for correspondence including Email address & mobile number.

Title

Must be informative, specific and short and not exceed 100 words.

Authors and affiliations

The names of authors and their appropriate addresses should be given. It should be made clear which address relates to which author.

Running title

It is a short title typed in the journal at the right top corner of right hand page of the article (except the lead page). A short running title of not more than 40 characters should be given.

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Abstract and key words

Abstract: It must start on a new page carrying the following information: (a) Title (without authors names or affiliations), (b) Abstract body, (c) Key words, (d) Running title. It should not exceed 350 words excluding the title and the key words. The abstract must be concise, clear and informative rather than indicative. New and important aspects must be emphasized. The abstract must be in a structured form consisting of background, objectives, methodology, result and conclusion briefly explaining what was intended, done, observed and concluded. Authors should state the main conclusions clearly and not in vague statements. The conclusions and recommendations not found in the text of the article should not be given in the abstract.

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Introduction

It should start on a new page. Essentially this section must introduce the subject and briefly say how the idea for research originated. Give a concise background of the study. Do not review literature extensively but provide the most recent work that has a direct bearing on the subject. Justification for research aims and objectives must be clearly mentioned without any ambiguity. The purpose of the study should be stated at the end. It should not exceed 500 words.

Methodology

This section should deal with the materials used and the methodology - how the work was carried out. The procedure adopted should be described in sufficient detail to allow the study to be interpreted and repeated by the readers, if necessary. The number of subjects, the number of groups studied, the study design, sources of drugs with dosage regimen or instruments used, statistical methods and ethical aspects must be mentioned under the section in text format not in structured format. The methodology- the data collection procedure - must be described in sufficient detail. If a procedure is a commonly used one, giving a reference (previously published) would suffice. If a method is not well known (though previously published) it is better to describe it briefly. Give explicit descriptions of modifications or new methods so that the readers can judge their accuracy, reproducibility and reliability. The nomenclature, the source of material and equipment used, with details of the manufacturers in parentheses, should be clearly mentioned. Drugs and chemicals should be precisely identified using their non-proprietary names or generic names. If necessary, the proprietary or commercial name may be inserted once in parentheses. In case of pharmaceuticals, the first letter of the drug name should be small for generic name (e.g., dipyridamole, propranolol) but capitalized for proprietary names (e.g., Persantin, Inderal). The routes of administration may be abbreviated, e.g., intraarterial (i.a.), intracerebroventricular (i.c.v.), intra-gastric lavage (i.g.), intramuscular (i.m.), intraperitoneal (i.p.), intravenous (i.v.), per os (p.o.), subcutaneous (s.c.), transdermal (t.d.).

Statistical Methods

The details of statistical tests used and the level of significance should be stated. If more than one test is used it is important to indicate which groups and parameters have been subjected to which test.

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The results should be stated concisely without comments. It should be presented in logical sequence in the text with appropriate reference to tables and/or figures. The data given in tables or figures should not be repeated in the text. The same data should not be presented in both tabular and graphic forms. Simple data may be given in the text itself instead of figures or tables. Avoid discussions and conclusions in the results section.

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This section should deal with the interpretation, rather than recapitulation of results. It is important to discuss the new and significant observations in the light of previous work. Discuss also the weaknesses or pitfalls in the study. New hypotheses or recommendations can be put forth. Avoid unqualified statements and conclusions not completely supported by the data. Repetition of information given under Introduction and Results should be avoided.

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Conclusions must be drawn considering the strengths and weaknesses of the study. They must be conveyed in the last paragraph under Discussion. Make sure conclusions drawn should tally with the objectives stated under Introduction.

Acknowledgements

It should be typed in a new page. Acknowledge only persons who have contributed to the scientific content or provided technical support. Sources of financial support should be mentioned.

References

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The number of table should be 3 or 4 in number. Each table must be self-explanatory and presented in such a way that they are easily understandable without referring to the text. It should be typed with double spacing and numbered consecutively with Arabic numerals. Provide a short descriptive caption above each table with foot notes and/or explanations underneath. The number of observations, subjects and the units of numerical figures must be given. It is also important to mention whether the given values are mean, median, mean±SD or mean±SEM. All significant results must be indicated using asterisks. Appropriate positions for the tables within the text may be indicated.

Check list for Table

- Units of data given?
- "n"mentioned?
- Mean ± SD or Mean ± SEM given?
- Statistical significance of groups indicated by asterisks or other markers?
- P values given?
- Rows and columns properly aligned?
- Appropriate position in the text indicated?

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- SD or SEM represented (graphically)?
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Authors should report systematic reviews and meta-analyses in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement. For Systematic Reviews, both abstract and text of the manuscript should be subdivided into the following sequential sections:

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used for article retrieval, including any constraints (for example, English language or human subjects). If abstract space does not permit this level of detail, summarize sources in the abstract including databases and years searched, and place the remainder of the information in the "Methods" section of the text.

4) Study Selection: Describe inclusion and exclusion criteria used to select studies for detailed review from among studies identified as relevant to the topic. Under details of selection include particular populations, interventions, outcomes, or methodological designs. Specify the method used to apply these criteria (for example, blinded review, consensus, multiple reviewers). State the proportion of initially identified studies that met selection criteria.

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6) Results: State the main results of the review, whether qualitative or quantitative, and outline the methods used to obtain these results. For meta-analyses, state the major outcomes that were pooled and include odds ratios or effect sizes and, if possible, sensitivity analyses. Accompany numerical results by confidence intervals, if applicable, and exact levels of statistical significance. For evaluations of screening and diagnostic tests, include sensitivity, specificity, likelihood ratios, receiver operating characteristic curves, and predictive values. For assessments of prognosis, summarize survival characteristics and related variables. State the major identified sources of variation between studies, including differences in treatment protocols, protocols, co-interventions, confounders, outcome measures, length of follow-up, and dropout rates.

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Systematic reviews are welcome. They should be critical assessments of current evidence covering a broad range of topics of concern to those working in the specific field of journal. Systematic reviews should be 4000-5000 words (abstracts to be structured as above).

N.B.: For advice on writing systematic reviews consult: **The Cochrane Reviewers' Handbook Meta-analysis of RCT:** A MOOSE checklist is required for meta-analysis of RCT.

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- Running title

- Number of pages, number of figures and number of tables.
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- Figures/photographs and legends
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Examples of References - Vancouver Style

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1. Standard journal article

List the first six authors followed by et al. (Note: NLM now lists up through 25 authors; if there are more than 25 authors, NLM lists the first 24, then the last author, then et al.)

Vega KJ, Pina I, Krevsky B. Heart transplantation is associated with an increased risk for pancreatobiliary disease. Ann Intern Med 1996 Jun 1;124(11):980-3

As an option, if a journal carries continuous pagination throughout a volume (as many medical journals do) the month and issue number may be omitted. (Note: For consistency, the option is used throughout the examples in Uniform Requirements. NLM does not use the option.)

Vega KJ, Pina I, Krevsky B. Heart transplantation is associated with an increased risk for pancreatobiliary disease. Ann Intern Med 1996;124: 980-3

More than six authors:

Parkin DM, Clayton D, Black RJ, Masuyer E, Friedl HP, Ivanov E, et al. Childhood leukaemia in Europe after Chernobyl: 5 year follow-up. Br J Cancer 1996;73:1006-12

2. Organization as author

The Cardiac Society of Australia and New Zealand. Clinical exercise stress testing. Safety and performance guidelines. Med J Aust 1996; 164: 282-4

3. No author given

Anonymous. Cancer in South Africa [editorial]. S Afr Med J 1994;84:15

4. Article not in English

(Note: NLM translates the title to English, encloses the translation in square brackets, and adds an abbreviated language designator.)

Ryder TE, Haukeland EA, Solhaug JH. Bilateral infrapatellar seneruptur hostidligere frisk kvinne. Tidsskr Nor Laegeforen 1996;116:41-2.

5. Volume with supplement

Shen HM, Zhang QF. Risk assessment of nickel carcinogenicity and occupational lung cancer. Environ Health Perspect 1994;102 Suppl 1:275-82.

6. Issue with supplement

Payne DK, Sullivan MD, Massie MJ. Women's psychological reactions to breast cancer. Semin Oncol 1996; 23(1 Suppl 2):89-97.

7. Volume with part

Ozben T, Nacitarhan S, Tuncer N. Plasma and urine sialic acid in non-insulin dependent diabetes mellitus. Ann Clin Biochem 1995;32(Pt 3):303-6.

8. Issue with part

Poole GH, Mills SM. One hundred consecutive cases of flap lacerations of the leg in ageing patients. N Z Med J 1994;107(986 Pt 1):377-8.

9. Issue with no volume

Turan I, Wredmark T, Fellander-Tsai L. Arthroscopic ankle arthrodesis in rheumatoid arthritis. Clin Orthop

1995;(320):110-4.

10. No issue or volume

Browell DA, Lennard TW. Immuno-logic status of the cancer patient and the effects of blood transfusion on antitumor responses. Curr Opin Gen Surg 1993:325-33.

11. Pagination in Roman numerals

Fisher GA, Sikic BI. Drug resistance in clinical oncology and hematology. Introduction. Hematol Oncol Clin North Am 1995 Apr;9(2):xi-xii.

12. Type of article indicated as needed

Enzensberger W, Fischer PA. Metronome in Parkinson's disease [letter]. Lancet 1996;347:1337.

Clement J, De Bock R. Hematological complications of hantavirus nephro-pathy (HVN) [abstract]. Kidney Int 1992;42:1285.

13. Article containing retraction

Garey CE, Schwarzman AL, Rise ML, Seyfried TN. Ceruloplasmin gene defect associated with epilepsy in EL mice [retraction of Garey CE, Schwarzman AL, Rise ML, Seyfried TN. In: Nat Genet 1994;6:426-31]. Nat Genet 1995;11:104.

14. Article retracted

Liou GI, Wang M, Matragoon S. Precocious IRBP gene expression during mouse development [retracted in Invest Ophthalmol Vis Sci 1994; 35:3127]. Invest Ophthalmol Vis Sci 1994;35:1083-8.

15. Article with published erratum

Hamlin JA, Kahn AM. Herniography in symptomatic patients following inguinal hernia repair [published erratum appears in West J Med 1995;162:278]. West J Med 1995;162: 28-31. Books and Other Monographs

(Note: Previous Vancouver style incorrectly had a comma rather than a semicolon between the publisher and the date.)

16. Personal author(s)

Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996.

17. Editor(s), compiler(s) as author

Norman IJ, Redfern SJ, editors. Mental health care for elderly people. New York: Churchill Livingstone; 1996.

18. Organization as author and publisher

Institute of Medicine (US). Looking at the future of the Medicaid program. Washington: The Institute; 1992.

19. Chapter in a book

Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: Pathophysiology, diagnosis, and management. 2nd ed. New York: Raven Press; 1995. p. 465-78.

20. Conference proceedings

Kimura J, Shibasaki H, editors. Recent advances in clinical neuro-physiology. Proceedings of the 10th International Congress of EMG and Clinical Neurophysiology; 1995 Oct 15-19; Kyoto, Japan. Amsterdam: Elsevier; 1996.

21. Conference paper

Bengtsson S, Solheim BG. Enforce-ment of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Infor-matics; 1992 Sep 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. p. 1561-5

22. Scientific or technical report

Issued by funding/sponsoring agency:

Smith P, Golladay K. Payment for durable medical equipment billed during skilled nursing facility stays. Final report. Dallas (TX): Dept. of Health and Human Services (US), Office of Evaluation and Inspections; 1994 Oct. Report No.: HHSI-GOEI69200860.

Issued by performing agency:

Field MJ, Tranquada RE, Feasley JC, editors. Health services research: work force and educational issues. Washington: National Academy Press; 1995. Contract No.: AHCPR282942008. Sponsored by the Agency for Health Care Policy and Research.

23. Dissertation/Thesis

Kaplan SJ. Post-hospital home health care: the elderly's access and utilization [Dissertation/Thesis]. St. Louis (MO): Washington Univ.; 1995.

24. Patent

Larsen CE, Trip R, Johnson CR, in-ventors; Novoste Corporation, assignee. Methods for procedures re-lated to the electro-

physiology of the heart. US patent 5,529,067. 1995 Jun 25.

Other Published Material

25. Newspaper article

Lee G. Hospitalizations tied to ozone pollution: study estimates 50,000 admissions annually. The Washington Post 1996 Jun 21;Sect. A:3 (col. 5).

26. Audiovisual material

HIV+/AIDS: the facts and the future [videocassette]. St. Louis (MO): Mosby-Year Book; 1995.

27. Legal material

Public law: Preventive Health Amendments of 1993, Pub. L. No. 103-183, 107 Stat. 2226 (Dec. 14, 1993). Unenacted bill: Medical Records Confidentiality Act of 1995, S. 1360, 104th Cong., 1st Sess. (1995)

Code of Federal Regulations: Informed Consent, 42 C.F.R. Sect. 441.257 (1995).

Hearing: Increased Drug Abuse: the Impact on the Nation's Emergency, Rooms: Hearings Before the Subcomm. On Human Resources and Intergovernmental Relations of the House Comm. On Government Operations, 103rd Cong., 1st Sess. (May 26, 1993).

28. Map

North Carolina. Tuberculosis rates per 100,000 population, 1990 [demo-graphic map]. Raleigh: North Carolina Dept. of Environment, Health, and Natural Resources, Div. of Epidemiology; 1991.

29. Dictionary and similar references

Stedman's medical dictionary. 26th ed. Baltimore: Williams & Wilkins; 1995. Apraxia; p. 119-20.

30. Classical material

The Winter's Tale: act 5, scene 1, lines 13-16. The complete works of William Shakespeare. London: Rex; 1973.

31. In press

(Note: NLM prefers "forthcoming" because not all items will be printed.)

Leshner AI. Molecular mechanisms of cocaine addiction. N Engl J Med. In press 1996.

Electronic Material

32. Journal article in electronic format

Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis [serial online] 1995 Jan-Mar [cited 1996 Jun 5];1(1):[24 screens].

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Editorial
Journal of Monno Medical College,
December 2018, Vol. 4, No. 2, pp 23-24 ISSN (Print) 2412-3277

Zika Virus Infection: A Public Health Threat to Bangladesh

Alam MJ

Zika fever, also known as Zika virus disease or simply Zika, is an acute infectious disease which is caused by Zika virus and is transmitted by infective, female, aedes mosquito. Most cases of Zika fever have no symptoms, but when present, they are usually mild and can resemble dengue fever[1-2]. This Zika virus is also related to yellow fever, Japanese encephalitis and West Nile viruses[2].

Zika virus (ZIKV) is an arthropod-borne virus which belongs to family Flaviviridae[3]. It was first isolated in Uganda in 1947 from Rhesus monkeys[4] in zika forest. Therefore, the virus is named after zika forest. The first large outbreak of disease caused by Zika infection was reported from Island of Yap in 2007. In July 2015, Brazil reported an association between Zika virus and Guillain-Barré syndrome (GBS). Furthermore, Brazil reported an association between Zika viru sinfection and microcephaly[5].

Outbreaks and evidence of transmission soon appeared throughout the Americas, Africa, and other regions of the world. To date, a total of 86 countries and territories have reported evidence of mosquito-transmitted Zika infection[6]. Zika virus has the potential for further international spread given the wide geographical distribution of the mosquito vector, a lack of immunity among population in newly affected areas and the high volume of international travel. However, the mosquito that transmits Zika virus namely Aedes aegypti that also transmits dengue virus, is widely prevalent in India[5].

In Bangladesh, Aedes mosquito borne disease like Dengue and Chikungunya fever already present. As Zika virus disease is an Aedes mosquito borne disease, so there is possibility of occurrence of Zika in Bangladesh. Report of a serological study from Institute of Epidemiology, Disease Control & Research (IEDCR), Dhaka, Bangladesh has revealed the evidence of Zika virus infection[7]. This virus is transmitted by infected mosquito, hence called arbovirus. The Reservoir of infection is not known though serological evidence has been found in monkeys, rodents and humans of West Africa[8]. Zika is primarily spread by Aedes aegypti and Aedes albopictus mosquitoes[9-10] and can also be transmitted through sexual contact[11] or blood transfusions[12]. Zika virus can spread by vertical transmission, during pregnancy or at delivery[13-14].

The incubation period is 3 to 12 days. Infection is asymptomatic or mild, resembling dengue with fever, headache, arthralgia, conjunctivitis and maculopapular rash[9]. Symptoms generally last less than seven days[15]. It has not caused any reported deaths during the initial infection[14]. Mother-to-child transmission during pregnancy can cause microcephaly and other brain malformations in some babies[16]. Infections in adults have been linked to Guillain–Barré syndrome[2].

Zika virus is diagnosed through PCR and virus isolation from blood samples. Serological diagnosis is not recommended. Zika virus disease is usually relatively mild and requires no specific treatment. Patients infected with Zika virus should get adequate rest and should be treated by paracetamol for pain and fever. Since there is no vaccine against the Zika Virus, you should take the necessary measures to protect yourself from mosquito bites. Mosquito repellents are safe and can be used on children and pregnant women, but always follow the guidelines on the packaging before use. Use mosquito nets when sleeping. Pregnant women must avoid sex with a person with the Zika Virus during their pregnancy or if they are planning to get pregnant.

Since Zika virus may be found in the semen or genital secretions for prolonged periods, infected individuals should practice safe sex for at least 6 months and planned pregnancy should be postponed for at least 6 months[10]. Women should avoid getting pregnant for up to 8 weeks if they have traveled to a Zika infected area. It is advised to cover the exposed skin and to wear light coloured clothing as much as possible in mosquito-infested areas. If you live in mosquito infested areas, then eliminate mosquito breeding sites.

Our country is already affected by wide prevalence of dengue and also by Chikungunya fever which are transmitted by Aedes mosquito. It is alarming for us and there is also a chance of attacking the country with Zika virus which may create a public health problem. Control of Aedes mosquito is theonly measure to combat the situation.

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Original Article

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Comparative Study between Sonographic and Clinical Expected Date of Delivery during First and Third Trimester of Pregnancy

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Abstract

Background: The correct expected date of delivery decreases the rate of inappropriate diagnoses of gestational age as well as reduce the numbers of inappropriate inductions of labor. **Objective:** This present study was aimed to find out the difference in days between EDD calculating from LMP and first trimester ultrasonography (USG) and with the expected date of delivery (EDD) revealed from third trimester USG. **Methodology:** This cross-sectional study was conducted in Department of Gynaecology and Obstetrics at Monno Medical College Hospital, Manikganj, Bangladesh from December 2016 to November 2018 over a period of 2(two) years. All pregnant women who gave consent and were fulfilled the exclusion and inclusion criteria of this study were selected as study population. Relevant history was taken and data were collected using a standard questionnaire containing all the variable of interest. **Results:** A total number of 200 pregnant women were recruited for this studyof which 30.0% patients had no discrepancy on EDD by USG in first trimester and EDD by LMP. Only 20 (10%) patient had showed more than 7 days difference in EDD by USG in first trimester and EDD by LMP. However, 56 (26%) patients were in 4 to 7 days difference and 128 (64%) patients had showed less than 3 days differences between EDD by USG in first trimester and EDD by LMP. The mean difference was 2.86±2.93 days in first trimester from EDD by USG. In third trimester, 56 (28%) patients showed less than 3 days difference. In this study maximum differences was found in between EDD by USG in first trimester (2.86±2.93 days) and EDD by USG in third trimester (7.68±5.71 days) with relation to EDD by LMP. Statistically significant difference is found between first trimester and third trimester of ultrasonography and EDD based on gestational age by LMP. **Conclusion:** Accurate dating by the first trimester ultrasonography is very significant and accurate. Ultrasonography in third trimester for determination of EDD is a reliable method with acceptable clinical range ±3 weeks. *[J Monno Med Coll December 2018;4(2): 25-29]*

Keywords: Clinical EDD, Sonographic EDD, LMP, trimesters

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Introduction

The first and foremost duty of an obstetrician for a pregnant woman is to date the pregnancy. Proper estimation of EDD is necessary for planning and to execute therapeutic maneuvers[1]. Accurate estimation of EDD helps in surveillance of both maternal and fetal conditions. Parameters of fetal growth, fetal maturity helps in detection of EDD. Certain decisions concerning management of preterm labour, postdated pregnancy and identification of intrauterine growth restriction (IUGR) are all based on gestational age of the fetus which is calculated from the EDD, based on the LMP. Normally, human gestation lasts for an average of 266 days from the date of conception or 280 days from the first day of the last menstrual period (LMP)[2]. Based on the assumption

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that a typical menstrual cycle lasts 28 days, with ovulation occurring on approximately day 14, the 19th –century obstetrician, it has been developed a simple calculation for estimated date of delivery that involved adding 9 calendar months and ±7 days to the first day of the LMP[3].

Clinical dating of pregnancy is usually based on the patient's LMP and on examination of symphysio fundal height[4]. LMP is considered adequate for the purpose of calculating the EDD only if the menstrual cycle is regular[5]. In USA, the EDD for most pregnancies is assigned according to Naegele's rule. In practice, EDD can be achieved by subtracts 3 months from the first day of the LMP and then adding 7 days[1]. It is stated that the LMP in term based on 282 days, on average, is significantly closer to the actual dayof delivery than the USG-term[6]. Dating by USG results in 18.0% of EDD become prompted and only 2.0% become delayed[7]. Adaptation USG biometry alone simplifies the calculation of the EDD, which is carried out automatically by most modern USG machines, but gestational age with ultrasound is also dependent on operator skill. The reliability of this approach depends on a number of factors including the woman`s accurate LMP, the regularity of her menstrual cycles and possible use of contraceptives or breastfeeding that could influence the timing of ovulation[2]. But despite of above facts the actual timing of ovulation can also flactuate[8-10].

Sonography is now the method of choice in predicting the day of delivery in many countries. Ultrasonography during pregnancy is one of the technical methods most commonly used in health care for estimation of gestational age. Maternal obesity and position of the fetus and also operator's skill can decrease the accuracy of the process. The determination of gestational age in the first trimester uses the mean gestational sac diameter (MSD) and or the crown rump length (CRL). During the first 3 to 5 menstrual weeks an intrauterine pregnancy is first signaled by the presence of a gestational sac. During first trimester crown-rump-length (CRL) is the best parameter for determining gestational age. The CRL measurement is reported to be accurate for dating within 3 to 8 days. The MSD should not be used to estimate the gestational age once the CRL can be measured. Between 12th and 14th weeks of pregnancy, CRL and BPD are similar in accuracy. It is recommended that CRL be used up to 84mm and the BPD be used for measurements after that.

Many sonographic parameters have been proposed for estimating gestational age in the third trimesters. These include several fetal measurements: femur length (FL), biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC)[4]. In the third trimester, 3-weeks discrepancy between LMP and ultrasound dating is allowed, but IUGR should also be kept in mind[5]. The need for optimal pregnancy dating arises primarily when pathology is suspected and intervention is planned. It is also kept in mind that fetuses of the same size at the time of ultrasound assessment, are not always of the same age. Growth restricted fetus (IUGR) will be smaller than expected and the estimated date of delivery will not be correlate with the LMP. Such a discrepancy is not only indicative of early intrauterine growth restriction of the fetus but is also associated with adverse perinatal outcome. In this study, the focus was primarily on methods for estimation of gestational age and to study the potential impact of two pregnancy dating procedures like LMP and USG for calculation of estimated gestational age. This study was designed to analyze accuracy of expected date of delivery mainly based on calculating LMP and early ultrasonography and on ultrasonography in 3rd trimester of pregnancy in Bangladeshi perspective.

Methodology

It was a descriptive type of cross sectional study conducted in Obstetrics and Gynaecology department of Monno Medical College and Hospital (both outdoor and indoor), Manikganj, Bangladesh over a period of 2 years from December 2016 to November 2018. All pregnant women who gave consent attending Obstetrics and Gynaecology department (outdoor) of Hospital were chosen as study population. Sample size was 200 and sampling technique was purposive. Materials used were detailed history sheet, Investigation: USG record of 1st trimester of pregnancy, Measuring tape, ultrasonogram mechaine, Gloves, GelSelection Criteria werepregnancy with duration >30 weeks. Patient with known LMP, regular menstrual cycle (28±2days), Singleton pregnancy, longitudinal lie, live pregnancy, booked patients having USG record of 1st trimester of pregnancy. Pregnancy with unknown LMP. With medical and obstetrical complication, IUFD were taken as exclusion criteria. The statistical analyses of collected data were performed using Special Package for Social Sciences (SPSS-V.19) computer program. Quantitative data was expressed as mean, standard deviation, frequency and percentage. Comparison was done by unpaired t – test where necessary. A probability p value of<0.01 was considered statistically significant and $p<0.001$ was considered highly significant but $p>0.05$ taken as non-significant.

Results

A total number of 200 pregnant women were recruited for this study after fulfilling the inclusion and exclusion criteria. In this study considering the age distribution of the patients, 56 (28.0%) patients were below 20 years, 48 (24.0%) patients were in age range 21 to 25 years, 56 (28.0%) patients were in age range 26 to 30 years and 40 (20.0%) patients were above 30 years. Minimum age 15 years and maximum 40 years. Mean±SD age was 25.40±6.24 years (Table 1).

Table 1: Age Distribution of the Study Patients (n=200)

Age Group	Frequency	Percent
Less than 20 Years	56	28.0
21 to 25Years	48	24.0
26 to 30Years	56	28.0
More than 30Years	40	20.0
Total	**200**	**100.0**
Mean±SD (Range)	25.40±6.24 (15-40) years	

In this study maximum patients were primi para which was 152(76.0%) cases and the rest of 48(24.0%) patients were multi para (Figure I).

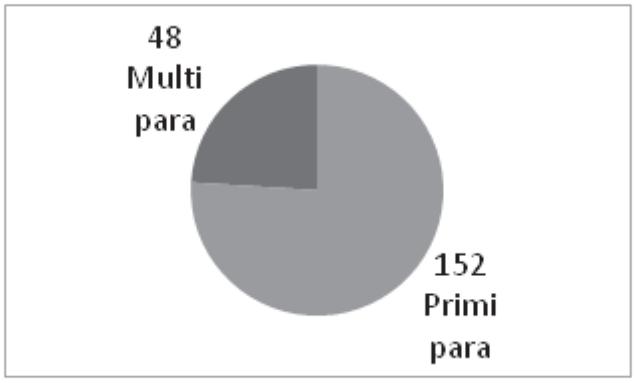

Figure I: shows the parity of the patients

In this study considering the occupational distribution of the patients, majority of the patients 140(70.0%) were housewife, (48) 24% patients were garments worker (Table 2).

Table 2: Occupational distribution of the study patients (n=200)

Occupation	Frequency	Percent
Housewife	140	70.0
Garments worker	48	24.0
Service holder	04	2.0
Day labour	08	4.0
Total	**200**	**100.0**

The socioeconomic status of the patients were recorded and it was found that most of the patients 68.0% were from middle class family, 20.0% patients from upper class family and 12% patients were lower class family (Table 3).

Table 3: Distribution of the Study Patients by Socioeconomic Status (n=200)

Socioeconomic status	Frequency	Percent
Lower class (<5000 Tk.)	24	12.0
Middle class (5000 to 10000 Tk.)	136	68.0
Upper class (>10000 Tk.)	40	20.0
Total	**200**	**100.0**

In this study maximum diferences in between EDD by USG infirst trimester was below 3 days which was in 128(64.0%) patients followed by 4 to 7 days and above 7 days differences from EDD which was 52(26.0%) cases and 20(10.0%) cases respectively(Table 4).

Table 4: Distribution of Patients by UltrasonographicEDD in First trimester (n=200)

Day differs from EDD by LMP	Frequency	Percent
Less than 3 days	128	64.0
4 to 7 days	52	26.0
More than 7 days	20	10.0
Total	**200**	**100.0**

Considering the ultrasonographic EDD in third trimester, maximum diferences in between EDD by USG in third trimester was above 7 days which was 92(46.0%) patients; however, 52(26.0%) patients were from 4 to 7 days differences and 56(28.0%) patients were found below 3 days differences from EDD (Table 5).

Table 5: Distribution of Patients by ultrasonographic EDD in Third Trimester (n=200)

Day differs from EDD by LMP	Frequency	Percent
Less than 3 days	56	28.0
4 to 7 days	52	26.0
More than 7 days	92	46.0
Total	**200**	**100.0**

The comparison of EDD in between USG in first trimester and third trimester and in relation to EDD was recorded. Statistically significant was found in the difference between EDD of first trimester and third trimester of EDD ($p < 0.001$).

Table 6: Comparison of EDD inbetween USG in First trimester and Thirdtrimester and in relation to EDD by LMP (Mean±SD)

Parameter	First trimester	Third trimester	P value
EDD by USG (days)	2.86±2.93	7.68±5.70	<0.001*

Paired t-test was used to compare 1st trimester and 3rd trimester; SD=Standard deviation

Discussion

This cross-sectional study was conducted among 200 patient who attended the outpatient department of Gynaecology and Obstetricsin Monno Medical College Hospital. The study was aimed to find out the difference in days between EDD calculating from LMP and first trimester USG and with the EDD revealed from third trimester USG.

In present study, 56 (28.0%) patients are below 20 years; however, 48 (24.0%) patients are in age range of 21 to 25 years. Furthermore, 56 (28.0%) patients are in the age range of 26 to 30 years and 40 (20.0%) patients are above 30 years. Minimum age is 15 years and maximum is 40 years. The mean age with SD is 25.40±6.24 years. Maximum patients (76.0%) areprimipara and 24.0% patients are multipara. Majority of the patients were housewife(70.0%) followed by service holder (24%). However, 68.0% patients are from middle class family; 20.0% patients are from upper class family and 12% patients are from lower class family. Falatah et al[11] have demonstrated that the mean age of the respondents is 27.9±2.41 (range 17–45) years. Most of the women (96.8%, 429/443) are married. The majority of respondents are multiparous (56.7%, 251/443) and have tertiary education (79.5%, 352/443). Furthermore, 54.5% are middle class family. The findings of the study is consistent with this present study.

In this study, most (34.0%) of the patients had no discrepancy on EDD by USG in 1st trimester and EDD by

LMP. Only 20(10%) patient shows more than 7 days difference in EDD by USG in 1st trimester and EDD by LMP. 52 (26%) patients 4 to 7 days difference and 128 (64%) patients shows less than 3 days differences between EDD by USG in 1st trimester and EDD by LMP. Mean difference 2.86±2.93 days in first trimester from EDD by USG.

Hoffman et al[12] reported ultrasound in the first trimester is generally considered a highly accurate method of pregnancy dating. The authors studied first trimester report of LMP and first trimester ultrasound for estimating GA at birth of 1867 singleton live births to women and found LMP-based estimates were 0.8 days (standard deviation=8.0, median=0) longer on average than ultrasound estimates. Results indicate similarity with the present study with standard deviation 2.93 in first trimester USG in relation to EDD by LMP.

In this present study findings are differed from Brakohiapa et al[13] who conducted a study on females presented for antenatal sonographic evaluation in first trimester in pregnancy and found that first trimester estimations were the most accurate with 18.6% having no deviation, and 67.8% having gestational ages within the acceptable clinical range (±2 weeks). And in the current study 34% of the patient had no discrepancy on EDD by USG In 1st trimester.

In present study, 56 (28%) patients show less than 3 days difference, 52 (26%) patients shows 4 to 7 days difference and highest percentage 92 (46%) patients more than 7 days difference EDD by USG in 3rd trimester and EDD by LMP. Ugwuet al[14] have investigated pregnant women, having difference in gestational age when examined by ultrasound in last trimester and calculated the last menstrual period. They found 15.40% pregnant women have 0 week different in gestational age between US and LMP and 38.46% pregnant women have 1 week different between ultrasound gestational age and 13.46% pregnant women have 3 weeks different between the gestational ages by USG. In this study, there is no difference in EDD by LMP among 6% patients.

Dietz et al[15] reported from their study on late pregnancy that overall 17.2% of gestational age estimates had an absolute difference of more than 14 days between the LMP based and ultrasound EDD. This result may simulate with this present results as it has been found 46.0% gestational age which is more than 7 days (more than 14 days 20%) difference between LMP based and USG based EDD.

Many patients in this present study set up, due to socio-economic reasons, come for their first antenatal visits in third trimester. Most of them are uneducated come from remote areas. Many being lactating mothers unsure of LMP or having irregular cycles. Because of non-availability of any dating scan or earlier ultrasound and uncertainty in LMP, it becomes very difficult to calculate their due dates. It has been sought to better understand the differences of gestational age estimated by ultrasonography in 1st trimester and third trimester. In the third trimesters, estimation of gestational age is accomplished by measuring the biparietal diameter, head circumference, abdominal circumference, and femur length. These measurements are only as good as the quality of the images. Optimal imaging can be difficult in some clinical situations, such as in a late pregnancy abnormal lie when the head is deep in the maternal pelvis, maternal obesity, or multiple gestation. Normal biological variation appears to have more influence on measurements in the third trimester. Thus, in late pregnancy, these measurements are less reliable than first trimester, and they may become increasingly in accurate as gestation progresses. Maternal and fetal pathology may affect them.

In this study observed that maximum differences in between EDD by USG in first trimester 2.86±2.93 days and EDD by USG in third trimester 7.68±5.71 days with relation to EDD by LMP is 21 days and minimum difference is 0, Mean difference is 4.80 days. Paired t-test shows significant different (p=0.001) which is statistically significant. This finding correlate with Ugwu et al[14], who showed significant differences in EDD by first and third trimester ultrasonography and EDD based on gestational age by LMP.

Conclusion

Ultrasound has an established role in estimating gestational age and EDD. This study helps women to accurately determine EDD by ultrasonography in 1st and 3rd trimester and based on their LMP. Accurate dating by the first trimester ultrasonography is very significant and accurate. Ultrasonography in third trimester for determination of EDD is also a reliable method with acceptable clinical range ±3 weeks. Thus, third trimester ultrasound should not be used as detection of gestational age alone, but it can be used as an important tool for detecting EDD, where LMP and first trimester ultrasound record are not available.

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Original Article

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Impact of Socio-Economic Status on Age at Menarche in Rural Bangladesh

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Abstract

Background: Menarche is a sign that reproductive organs have become active. Previously, the age at menarche has decreased gradually, especially in the United States and Europe. **Objectives:** The objective of the study was to find out the impact of socio-economic status on age at menarche in rural Bangladeshin relation to socio-economic condition of the respondents. **Methodology:** This cross sectional study was conducted in Upazilla Health Complex at Dhamrai, Dhaka, Bangladesh from Jnuary 2017 to July 2017. Respondents were interviewed face to face with the help of a questionnaire which was prepared on the basis of variables to be studied. **Results:** A total of 260 respondents were interviewed. Among the respondents majority (50.38%) of females were in the age group of 15 to 20 years. Regarding age at menarche majority (44.23%) of girls were found within12 to 13 years, where as 25.38% of girls were less than 12 years and 30.38% were more than 13 years. Data revealed Muslim females constituted 91.53% and Hindu 8.46%. The head of the family of respondents (77.69%) was father as well as 15.76% were led by husband. Regarding the level of mother's education majority 33.84% were illiterate, and most of them (29.23%) were not cross the school level. The mostly income of 48.46% of families had the taka 5000 taka to 10000 taka. **Conclusion:** In conclusion number of variables affects the age of menarche and the socio-economic condition of rural area like low level of education, poor nutrition, lack of motivation, lack of information which warrants attention of the government and demands proper intervention of all the related authorities *[J Monno Med Coll December 2018;4(2): 30-33]*

Keywords: Menarche; Socio-economic condition; impact

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Introduction

Menarche is defined as the first menstrual period. It is considered to be the most obvious sign of puberty in girls. It has been regarded inmany cultures as a transitional step to womanhood. Socioeconomic status has also been postulated as a determinant of age at menarche. According to previous studies, among girls from lower socioeconomic strata, menarche is delayed by exposure to adverse environmental and nutritional factors during early childhood or even deficient nutrition during adolescence. However, other studies indicate that among lower socioeconomic strata, menarche may occur earlier because rates of obesity and overweight are higher in such groups[1].

In developing countries, socioeconomic factors are often the main determinants of nutritional status and growth from childhood to adulthood throughout adolescence. Socioeconomic factors play a unique role in the secular trend of menarcheal age, and menarcheal age decreases as socioeconomic status improves[2]. During the past century there has been a secular (time related) trends towards an earlier onset of menarche in developed countries, with a decline of 2 to 3 months per decade in Europe and United States. General improvement in nutrition and health has been suggested to explain the downward trend. The earlier onset of menarche has also been seen in developing countries like Bangaladesh[3].

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Nutritional status has been postulated as a factor connecting socioeconomic status to age at menarche. Thus, according to studies in Brazil, children with high socioeconomic status showed higher overweight and obesity rates, coinciding with earlier pubertal development. The effect of excess weight has also been reported by studies in Chile, showing that girls with low socioeconomic status were more likely to have excess weight distinct racial differences in the time course of sexual maturation have been noted between African-American (AA) and European-American (EA) girlsand earlier menarche. The current study found no significant differences between socioeconomic levels and BMI or nutritional status, so there may be other factors connecting socioeconomic status and age at menarche. Studies in Africa have suggested that malnutrition in early childhood can delay pubertal development, menarche, and other growth processes[1].The study was carried out impact of socio-economic status on age at menarche in rural Bangladesh.

Methodology

This cross sectional study was conducted in Upazilla Health Complex at Dhamrai, Dhaka, Bangladesh. This study was carried out from women of reproductive age group from January 2017 to July 2017. Respondents were interviewed face to face with the help of a questionnaire which was prepared on the basis of variables to be studied like age, occupation, education, income, dietary intake. Statistical analyses were carried out by using the Statistical Package for Social Sciences version 20.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean, standard deviation, and categorical variables as frequencies and percentages. Prior to the commencement of this study, the research protocol was approved by the local Ethical Committee.

Results

This descriptive cross sectional study was conducted among the women of reproductive age group in DhamraiThana from January 2017 to July 2017. Following purposive sampling technique 260 respondents were included and data collection was done by face to face interview by using pretested structured questionnaire and data were analyzed by using SPSS version 17. Written informed consent was taken from the respondents before data collection.Majority (50.38%) of females were in the age group of 15 to 20 years. Regarding age at menarche majority (44.23%) of girls were found within12 to 13 years, whereas 25.38% of girls were less than 12 years and 30.38% were more than 13 years. Data revealed Muslim females constituted 91.53% and Hindu 8.46%. The head of the family of respondents 77.69% wasfatheras well as 15.76% wereledby husband. Regarding the level of mother's education majority 33.84% were illiterate, and most of them (29.23%) were not cross the school level. The mostly income of 48.46% of families had the taka 5000 taka 10000 taka.

Table 1: Distribution of Respondents According to Socio-Demographic Characteristics (n=260)

Variables	Respondent	
	Frequency	Percent
Age Group (Years)		
• <15	35	13.46
• 15-20	131	50.38
• >20	94	36.15
Religion		
• Muslim	238	91.53
• Hindu	22	8.46
Marital status		
• Married	58	22.30
• Unmarried	202	77.69
Head of family		
• Father	192	73.07
• Husband	48	18.46
• Others	20	7.69
Levels of education of respondent's mother		
• Illiterate	101	38.84
• Primary	76	29.23
• Secondary	59	22.69
• Graduate	11	4.23
• Others	13	5.00
Age at menarche		
• Less Than 12 Years	66	25.38
• 12 to 13 Years	115	44.23
• More Than 13 Years	79	30.38
Occupation of mother		
• Housewife	115	44.23
• Service	25	9.61
• Day labor	17	6.53
• Maid servant	13	5.00
• Business	22	8.46
• Agricultural worker	33	12.69
• Others	35	13.46

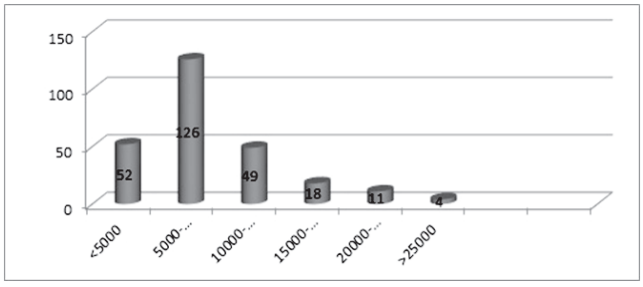

Figure I: Distribution of the respondent's family income (n=260)

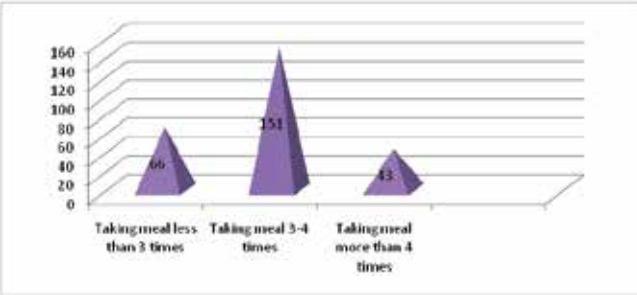

Figure II: Respondents distribution according to taking meal per day (n=260)

Discussion

The life style changes resulting from industrialization, decreased levels of physical activity and increased or excess intake of energy substrates has led to a rapid decrease in age at onset of menarche both in developed and more recently in developing countries. Early onset of menarche has been shown to be associated with higher body mass index (BMI), risk factor of cardiovascular diseases and its associated morbidity and mortality as well as type 2 diabetes. In Bangladesh the current mean age at menarche is 12.8 years in Bangladesh, which was considerably lower than the previous estimate. Bangladesh is a low-income country with a GDP per capita income of 588 USD, an average life expectancy at birth of 67 years, and an adult literacy rate of about 55%. Besides, in Bangladesh more than one-third of the population lives below the poverty lines and are unable to even meet the barest of their basic needs, and women disproportionately constitute the bulk of the poor community[4].

There is substantial evidence that earlier menarche increases a female's lifetime risk of breast cancer, possibly because of longer exposure to estrogens, and recent reports suggest that more rapid adolescent physical growth and earlier completion of adolescent growth may also increase lifetime risk of breast cancer. However, earlier menarche is also associated with higher bone mineral density and lower risk of osteoporosis, possibly through longer reproductive years. Higher levels of physical activity in girls have been found to be associated with delayed menarche. The menarcheal age was later in countries where dietary fiber intake was higher[2]. It has been reported that onset of menarche is late among girls of parents with a lower educational level, which may be a marker for lower socioeconomic status. Onset of menarche and age at peak height growth velocity tend to be earlier with urbanization. Age at menarche is also affected by ethnicity, social class differences, number of siblings, and secular trends[5].

Delayed menarche may be a sign of malnutrition; since as nutritional status improves, the attainment of menarche is lowered. The attainment of menarche decreases when BMI increases[3]. There is a correlation between BMI and attainment of menarche and also, there is a correlation between early obesity and early onset of menarche. Pubertal delay could be the result of under-nutrition, emotional deprivation, excess increase in protein degradation, accumulation of toxic substances, stress, and the secondary effects of therapy[5]. The history of mood disorders in mothers predicted earlier pubertal timing in daughters, and this relation was fully mediated by dyadic stress and biological father absence. The girls exposed to familial distress like death of one or both parents, separation or divorce of the parents, a single-mother family, prolonged illness of a member of the family, presence of social deviations such as alcoholism of one or both parents, and criminal records are more likely to have an early puberty, which is associated with a short final stature[2].

The socio-economic status is a strong predictor of menarche. Studies have suggested that menarche tends to appear earlier in life as the social, nutritional and economic condition of the society improves[3]. Vitamin D deficiency is associated with the development of adiposity in children, and childhood obesity could be a risk factor for early puberty thus, vitamin D might play a role in the timing of puberty[7].

Defining social status on the basis of parental occupation has been used quite often. Parent's occupation and mean menarcheal age of the daughters is strongly associated in the present study. In present study the mostly income of 48.46% of females had the highest taka 5000 taka to 10000 taka. Only 4.23% got taka 25,000 and above. The relationship between age at menarche and socioeconomic status investigated in India revealed that the mean menarcheal age steadily increased with the decrease in per capita income. In later study the socio-economic differences were, however, non-significant[8].

Mean menarche age was 12.5+1.4 years, which is lower in comparison with other counties[4-7]. Although the main timing of puberty changes is the genetic factors, other factors such as geographical location, general health status, nutrition and socioeconomic status affect the onset of menstruation and its progression. The interesting point is that girls with earlier puberty have shorter height in adulthood in comparison with those with delayed puberty, although the former experience a speeded development and enjoy a taller height at puberty. Girls with earlier puberty close their epiphysis plates earlier due to estrogen secreted from ovarian and will have a meager chance to increase height after puberty; consequently, their adulthood height will be shorter than those with earlier puberty age. Bagga and Kulkarni[8] also found that (10 to 35 years old) female participants who stated their menarche age to be lower than 11 years old experienced BMI of 2 to 3 kg/m^2 higher than participants who stated their menarche age to be after the age 14 years.There is a reversal relation between age of menarche and body mass index (BMI) that the mean for age of menarche decrease steadily from 13.3,12.7, to12.3 years as the BMI increase from 15-19, 20-25 to >25 respectively[10].

Pejhanet al[9] showed that a significant finding that the age at menarche was lowest in girls from high socio-economic

households and school girls from the upper socio-economic class reached menarche 11 months earlier than their lower socioeconomic counterparts.

WHO considers adolescence to take place between the ages ten to nineteen[12]. In general, better nourished girls have been found to attain menarche earlier than undernourished girls[13]. The results also revealed that mother's education was significantly related to the menstruating status, where only 33.84% of the students whose mothers were illiterate were menstruating as compared with 30% of student's whose mothers were primary education. Opposite figure has been shown in this study. The mean age at menarche was older when the mother was illiterate or with lower education, when compared to that noted among daughters of higher education mothers, the difference was statistically significant. Seasonal changes, such as the availability of food, increase the number of girls experiencing menarche. In a study following girls in rural Bangladesh, it is seen that there is a peak of menarche occurring in the summer months May through August. The study suggests this is because there is an increase in food availability which would allow for more food intake[10]. Regarding Nutritional status majority (51.15%) of the respondents were undernourished. A study in Punjab shows that menarche is actually delayed due to under nutrition. Nutritional status has an important role in attainment of menarche. As the nutritional status improves, attainment of menarche is lowered. It has also been observed that as the BMI increased, the number of girls attaining menarche also increased. Thus, nutritional status is positively associated with attainment of menarche[11]. The relationship between age at menarche and socioeconomic status investigated in India[12] revealed that the mean menarcheal age steadily increased with the decrease in per capita income. In later study the socio-economic differences were, however, non-significant. It is now generally accepted that protein-rich diet induces an earlier onset of menarche. However, in another study[13] girls showed attainment of menarche significantly later by non-vegetarian girls as compared to vegetarians. Apparently, nutrition cannot be the only influential factor[8].

Delayed menarche may be a sign of malnutrition; since as nutritional status improves, the attainment of menarche is lowered. Nielsen[14] described that attainment of menarche decreases when BMI increases. There is a correlation between BMI and attainment of menarche and also, there is a correlation between early obesity and early onset of menarche. Girls with early onset of menarche had higher BMI than those with late onset of menarche. Age at menarche varies widely and is delayed in populations with poor nutrition[6].

Conclusion

Menarche is the onset of menstruation and it is one of the most significant mile stone in a woman's life. Unlike other pubertal changes that are gradual and continuous, menarche is a distinct event with a sudden onset. It is highly correlated with after pubertal characteristic and is, therefore preferred as a benchmark for sexual maturation. For most females it occurs between theages of 10 to 16 years, however, it shows a remarkable range of variation.

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Original Article

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Sex Difference by Maximum Breadth of Fully Ossified Dry Human Left Calcaneus: A Cross Sectional Study

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Abstract

Background: Gender determination is one of the major challenges for the forensic anthropologist within a medico-legal context; it is considered an early step in personal identification from skeletal remains and it is indispensable for applying procedures to define race and age at the time of death. **Objectives:** The aim of this study was to collect data regarding maximum breadth of fully ossified dry human calcaneus and to find out possible variations in male and female. **Methodology:** This cross sectional was done on one hundred and fifty five (155) fully ossified dry human left calcaneus of unknown sex in Bangladesh at Department of Anatomy, Sir Salimullah Medical College, Dhaka, Bangladesh from January 2014 to June 2015. The study sample were distributed in male and female sex group by discriminant function analysis technique. **Results:** Among 155 calcaneus 51.61% was male and 48.38% was female. The mean (±SD) value of maximum breadth of calcaneus were greater in male than female which was statistically significant ($p<0.01$). **Conclusion:** Maximum breadth of calcaneus were greater in male than female. The difference in maximum breadth can be useful in sex differentiation. *[J Monno Med Coll December 2018;4(2): 34-37]*

Keywords: Maximum breadth; calcaneus; sex; discriminant function analysis technique

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Introduction

The calcaneus, the heel bone, is the largest of the tarsal bones. It articulates with the talus above and cuboid in front. It is a rectangular block of bone characterized by sustenticulumtali, a shelf that projects from the upper border of its medial surface[1].

Calcaneus has six surfaces i.e. dorsal, plantar, lateral, medial, anterior, and posterior. Its smooth anterior articular end contrast with its larger, rough posterior aspect. The dorsal surface bears centrally a large articular facet. The plantar surface is rough, the lateral surface is flat, and the medial surface is hollowed[2]. Since calcaneus bone is located at the rear portion of foot, it is most vital in bearing weight of body. Approximately 50% of body weight is distributed through subtalar joint to calcaneus, with remaining 50% transmitted across metatarsal heads. As we stand on our feet, supports leg and helps in easy walking. Functions like rotating and bending foot are possible on calcaneus bone. It forms posterior pillar of the two longitudinal arches[3].

The sustentaculumtali is a facet of calcaneus is also known as talar shelf. As it projects from the main bone mass at 90° angle, it is important as weight-bearing structure. As a weight-bearing apparatus the sustentaculumtali not only is essential to stand upright and locomotion but is also susceptible to injury. Since it supports the inside edge of talus the bone upon which the leg bones stack at ankle joint, it helps in keeping ankle from rolling inward when weight is placed upon foot thus it is the key to maintain one's center of

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gravity. If excessive forces are directed upon the lower leg from an outward direction such as a blow to the outside of leg or a misstep that causes an ankle roll, the ligaments attaching to tali may be damaged[4].

In the upper surface calcaneus forms talocalcaneal joint with talus. This joint maintains eversion and inversion of foot and named as subtalar joint. The subtalar joint has three important functions: Adapting to changes in terrain while walking, pivoting our body on our feet, shock absorption as our feet hit the ground. Problems associated with subtalar joint are arthritis, flat foot, cavus foot, tarsal coalition[5].

It is widely been recognized that skeletal characteristic vary among populations. So each population should have specific standards to optimize the accuracy of identification. Measurements from skull, pelvis and long bones have been used in determination of population affinity, sex and age assessments. But it has become necessary to assess the usefulness of other bones since the above mentioned bones are often recovered fragmentarily instead of whole. Preservation of bones is a very important factor for anthropological and forensic investigation. Calcaneus bones are relatively more durable than other bones and such estimates are very useful in cases of poor preservation[6].

Sex estimation from calcaneus has potentially significant importance for forensic community. Specifically measurements of calcaneus provides an additional reliable method for sex estimation via discriminant function analysis[7-10]. The maximum breadth of calcaneus by far the best single variable for estimation of sex. No citable published research works on calcaneus in Bangladesh has been found. This study was undertaken to measure the maximum breadth of calcaneus and to evaluate the difference in length of same between male and female. Osteometric measurements of calcaneus improves the knowledge of anatomy, treatment and diagnostic procedures of orthopaedic surgery, kinesiology, physical treatment and rehabilitation sections[8].

Methodology

This cross-sectional was done in the Department of Anatomy at Sir Salimullah Medical College, Dhaka, Bangladesh from January 2014 to June 2015 for a period of one and half year. The dry left sided adult human calcaneus were collected from medical students of Sir Salimullah Medical College (SSMC), Dhaka and Dhaka National Medical College. Then the sexes of collected calcaneus were determined by discriminant function analysis. Procedure for determination of sex from calcaneus by discriminant function analysis[7]. This linear discriminant function analysis technique was applied to the collected data in as follows:As discriminant function $Z = b_1 \times MAXB + b_2 \times MAXL + c$; Here, Z = Discriminant function; c=Constant; b_1 and b_2= discriminant co-efficient; MAXB= Maximum breadth; MAXL= Maximum length. In this study the value of Z for each specimen was calculated by substituting the values of variables in linear function. A sectioning point was created by using mean discriminant scores which were also known as group centrioid. To assign the case to either male or female sex the product Z was compared to the sectioning point derived by discriminant function analysis. A value higher than sectioning point was considered to be male and a value below it was considered to be female. The values of co-efficient (b_1 and b_2) were obtained by using standard computer program with the help of following equation.Afterwards though calcaneus is an irregular bone, maximum breadth of this bone was measured with the help of digital slide caliper and then the straight measurements at values were considered. For the measurement of maximum breadth of calcaneus a red dot was given on anterior most point of calcaneus and blue dot was given on posterior most point of calcaneal tuberosity. The fixed jaw of digital slide caliper was placed on anterior most point of calcaneus and sliding jaw was fixed on posterior most point of calcaneal tuberosity. The distance between two dots which is represented by MAXB was measured by digital slide caliper and recorded[9] (Figure I).

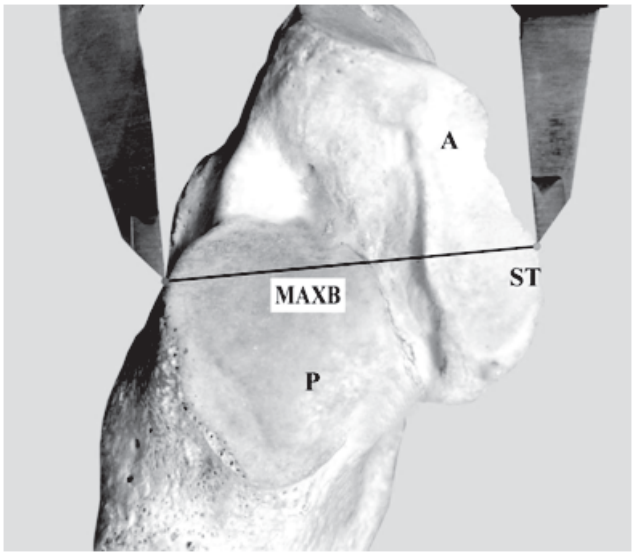

Figure I: Photograph showing maximum breadth measured by digital slide caliper. Red dot indicates the lateral most point on posterior articular facet and blue dot indicates the medial most point on sustentaculumtali. A represents anterior articular facet, P represents posterior articular facet and ST represents sustentaculumtali.

After collection of data the statistical analysis were done by unpaired Student's 't' test. The comparison between male and female was done by unpaired Student's 't' test. All the statistical analyses were done by using Computer based Software, Statistical Package for Social Science (SPSS) Version 20.0. This research work was carried out after approval of research protocol by Institutional Ethics Committee (IEC) of Sir Salimullah Medical College, Dhaka.

Results

One hundred and fifty five (155) dry left sided adult human calcaneus were collected from medical students of Sir Salimullah Medical College (SSMC), Dhaka and Dhaka National Medical

College, Dhaka, Bangladesh. The fully ossified dry human left cacaneus were grouped into male and female by after discriminant function analysis.

Table 1: Maximum Breadth of Calcaneus in Male and Female after discriminant function analysis

Gender	Frequency	Percent
Male	80	51.6
Female	75	48.4
Total	**155**	**100.0**

The range of maximum breadth of calcaneus was 36.80-47.00 mm in male and 28.10-39.10 mm in female. The mean (±SD) maximum breadth of left calcaneus was 40.81 (± 2.97) mm and 37.09 (± 2.83) mm in male and female. There was significant difference (p=0.000) in maximum breadth when compared between male and female (Figure II).

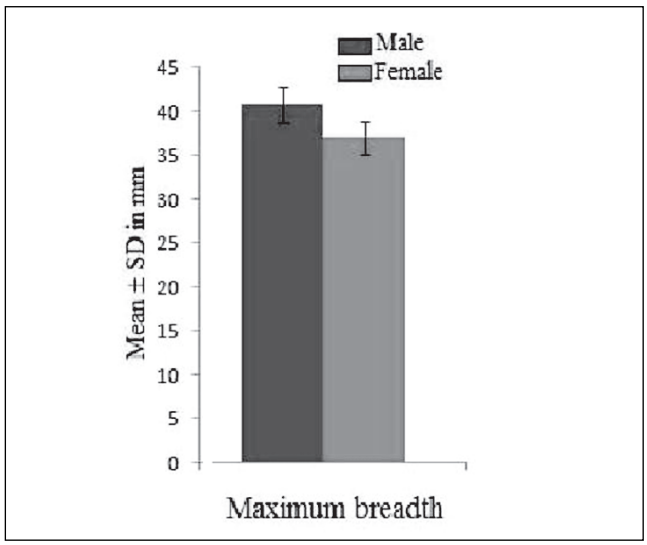

Figure II: Bar diagram showing minimum and maximum breadth of left calcaneus in male (n=80) and female (n=75)

Discussion

In the present study mean (±SD) maximum breadth was found greater in male than that of female and was statistically significant (p<0.01). The values of present study coincided with Kumar et al[11] who conducted study on Indian population. Similar geographical orientation of the population studied can be the cause of these similarities. The values of present study also coincide with Sakaue[12] who carried out study on Japanese and Gualdi-Russo[13] on Thai people.

A study was conducted by Sakaue[12] on 143 calcaneus of both sides in the University of Tokyo and the department of Anatomy, Chiba University School of Medicine and found the mean (±SD) maximum breadth was 39.7±2.3 mm in male and 36.4±1.8 mm in female. Statistically significant difference (p=0.001) was found when compared between male and female.

Ari and Kafa[7] conducted a study on 160 male calcaneus. Among them 72 were of left side and 88 were of right side and noticed that maximum breadth of calcaneus was 43.5±4.3 mm. Gualdi-Russo[13] performed a study on 106 calcaneus. Among them 70 were male and 36 were female. The samples were collected from Chiangmai University, Thailand. The mean (±SD) maximum breadth was 41.8±2.4 mm in male and 37.3±1.8 mm in female. The difference between male and female when compared was found to be statistically significant (p<0.01).

Introna et al[14] examined total 80 dried human calcaneus in which 40 were of male and 40 were of female and reported that maximum breadthwas 41.9±1.3 mm in male and 37.5±2.9 mm in female. Kumar et al[11] collected 100 samples of both sides from the department of Medical Science and Guru Teg Bahadur Hospital, New Delhi. Among them 50 were male and 50 were female. The mean (±SD) maximum breadth was 41.17±2.17 mm in male and 35.40±3.07 mm in female.

Gualdi-Russo[13] worked on 118 calcaneus of both sides of northern Italian population from the Frassetto skeletal collection. Among them 62 were male and 56 were female. The mean maximum breadth was 43.7±2.3 mm in male and 38.2 ±2 mm in female. There was statistically significant difference (p<0.001) between right and left calcaneus.

Murphey[15] examined 48 dried human calcaneus. Among them 26 were male and 22 were female and reported that maximum breadth of calcaneus was 44.21±1.88 mm in male and 40.43±41.86 mm in female. The difference between male and female when compared was statistically significant (p<0.0001).

Dimichele and Katherine[8] performed a study to calculate discriminant function for estimating sex on 320 calcaneus. Among them 136 were female and 184 were male and stated that maximum breadth of calcaneus was 44.61±2.61 mm in male and 39.49±2.08 mm in female. Statistically significant difference (p<0.001) was found when compared between male and female.

A study was done by Kimet al[9] on 104 calcaneus and reported maximum breadthof calcaneus was 43.1±3 mm in male and 39.6±2.4 mm in female. Statistically significant difference (p<0.05) was found when compared between male and female.

The present study was carried out in calcaneus collected from Bangladesh. Skeletons that are available in Bangladesh also come from neighboring countries. Bangladeshis are mixed race of Caucasoid, Negroid, Mongoloid and Australoid group. However the maximum length in present study was nearly similar to the mean values of other researchers.

Conclusion

The present study is an attempt to construct data on maximum breadth of left sided human calcaneus which will serve as a reference value in the field of Anatomy.

Maximum breadth of left human calcaneus is higher in male than that of female. Further radiographic study of living calcaneus and comparison of the radiographic findings of fully ossified dry human left calcaneus might be beneficial in this study.

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Original Article

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Risk of Aspiration in Hemispheric Infarcts in Different Arterial Territories

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Abstract

Background: There are several risk of aspiration in hemispheric infarcts in different arterial territories. **Objective:** The purpose of the present study was to assess the risk of aspiration in hemispheric infarcts involving different arterial territories and to establish the utility of CT scan of head in the assessment of risk of aspiration pneumonia in hemispheric infarcts. **Methodology:** This was a hospital based follow-up study conducted on three hundred patients with supratentorial ischaemic stroke, admitted into Dhaka Medical College and Hospital. **Result:** Mean age of the patients was 64.0 ± 9.9 years. Fifty six percent were males, forty four percent were females. Hemiparesis/plegia was the most frequent presenting feature. Hypertension was found as the most frequent risk factor (75 percent). **Conclusion:** Anterior circulation infarcts were associated with significantly higher risk of aspiration in supratentorialischaemic stroke patients. *[J Monno Med Coll December 2018;4(2): 38-41]*

Keywords: Risk factors; aspiration; hemispheric infarcts; arterial territories

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Introduction

Stroke is a focal or global neurological deficit of non-traumatic vascular origin which lasts 24 hours or more if the patient survives[1]. The high number of disability-adjusted life-years lost due to stroke shows that stroke severely impacts the economy of Bangladesh[2]. Ischaemic stroke constitute approximately 80.0% of total stroke patients[3]. Prevalence of stroke in Bangladesh is approximately 3 per 1000 person-year overall and 10 per 1000 person-year in people aged 70 years or more[4]. No data on incidence of ischaemic stroke have been recorded in Bangladesh. Ischaemic stroke comprised 60.0 to 80.0% of all stroke patients in studies conducted in Chittagong, Dhaka and Mymensingh Medical College Hospitals in the past decade[3].

Dysphagia is a common sequel of ischaemic stroke occurring in approximately 50.0% cases[5] and associated with increased morbidity and mortality[6]. Approximately half of the dysphagic patients fail to recover swallowing function within 1 week and are subject to an increasing risk of aspiration related complications[7]. Traditionally, risk of aspiration after stroke has been related to brain stem lesions[8]. However, aspiration is not uncommon in hemispheric infarcts[9].

According to guidelines, patient with insufficient oral intake for ≥7 days qualify for enteral tube feeding. Enteral tube feeding should be started within 72 hours of stroke onset[10], emphasizing the need for an early and accurate prediction of aspiration. The study on Swiss population revealed certain anatomical supratentorial locations are associated with increased risk of aspiration[11]. CT scan holds the key position in diagnosis of ischaemic stroke. Its evaluation in assessing

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the risk of aspiration pneumonia in hemispheric infarcts has been established in a few studies. However, No such study has been conducted on Bangladeshi population so far. Therefore, this study was intended to assess the risk of aspiration in hemispheric infarcts involving different arterial territories and to establish the utility of CT scan of head in the assessment of risk of aspiration pneumonia in hemispheric infarcts.

Methodology

This was a hospital-based follow-up study conducted on 300 hemispheric stroke patients admitted in Dhaka Medical College Hospital from July 2013 to June 2014. Hemispheric infarct patients aged 18 years or more, admitted within 48 hours of onset were selected for the study by random sampling from a large pool of stroke patients admitted in the departments of medicine and neurology of the hospital. Brainstem and cerebellar infarcts, haemorrhagic infarcts and patients with impaired level of consciousness or pre-existing dysphagia were excluded from the study. Important demographic variables and risk factors were recorded. Thorough neurological examination was conducted on every patient. Features of interest in CT scan were recorded after confirmation by a consultant radiologist. Risk of aspiration was assessed with two to six scale on admission[12]. On admission, a score of 0-1 were taken as no risk of aspiration and a score 2-6 were taken as risk of aspiration. A second assessment was done on day 7 after the onset of stroke, on patients with risk of aspiration in the first assessment. Patients with a score of 0 to 1 were considered as 'transient risk of aspiration' and 2-6 as 'extended risk of aspiration'. Arterial territory of infarct (anterior versus posterior circulation and anterior cerebral versus middle cerebral artery) was taken as an independent variables. Risk of aspiration: No, transient and extended risks were taken as dependent variables. Association between arterial territory involved and risk of aspiration assessed using standard statistical procedure.Statistical analyses were carried out by using the Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean, standard deviation, and categorical variables as frequencies and percentages. The differences between groups were analyzed by unpaired t-test, Fisher's exact test or Chi-square (X^2) test. A p-value <0.05 were considered as significant. Prior to the commencement of this study, the research protocol was approved by the local Ethical Committee.

Results

A total number of 300 patients of hemispheric infarcts were included in the study of which 168(56.0%)patients were males and 132(44.0%) patients were females. Risk factors of ischaemic stroke were searched among the study subjects. Hypertension was found in 75.0% patients. Smoking was a major risk factor in males (59.0%). Diabetes mellitus and dyslipidaemia were other risk factors which was found in both sexes. (Table 1).

Table 1: Risk Factors of Ischaemic Stroke

Risk Factor	Male	Female	Overall
Hypertension	114(67.8%)	111(84.1%)	225(75.0%)
Smoking	142(83.9%)	15(11.4%)	157(52.0%)
Diabetes mellitus	38(22.6%)	34(25.8%)	72(24.0%)
Dyslipidaemia	20(11.9%)	28(21.2%)	48(16.0%)
Family history of stroke	25(14.9%)	17(13.6%)	42(14.0%)
Previous stroke	15(8.9%)	11(10.1%)	26(8.7%)
Atrial fibrillation	18(10.7%)	7(5.3%)	25(8.0%)
Total	**168**	**132**	**300**

Anterior circulation infarcts comprised 93.0% study subjects whereas posterior circulation infarcts were 7.0% cases. Middle cerebral artery was the most affected territory (75.0%). Anterior and posterior cerebral arteries were involved in 25.0% and 7.0% cases respectively. (Table 2).

Table 2: Location of Supratentorial Ischaemic Stroke

Arterial territory	Cortical	Subcortical	Overall
Anterior Circulation	162(92.5%)	117(93.6%)	279(93.0%)
Anterior Cerebral	54(31.0%)	0(0.0%)	54(18.0%)
Middle Cerebral	118(62.1%)	117(92.9%)	225(75.0%)
Posterior Circulation	13(7.5%)	8(6.4%)	21(7.0%)
Total	**175(100.0%)**	**125(100.0%)**	**300(100.0%)**

Number of study subjects with risk of aspiration on day 1 was 106 (35.3%). Anterior circulation hemispheric infarcts were associated with higher proportion of risk of aspiration on day 1

Table 3: Association of Anterior Versus Posterior Circulation Ischaemic Strokes With Outcome

Outcome		Location			RR	95.0% CI	P value
		Anterior (n=279)	Posterior (n=21)	Total			
Risk of aspiration on day 1	Yes	104(37.3%)	2(9.5%)	**106**	3.91	1.04-14.76	0.01
	No	175(62.7%)	19(90.5%)	**194**			
Extended risk of aspiration on day 7	Yes	99(35.5%)	0(0.0%)	**99**	15.64	1.01-243.30	0.001
	No	180(64.5%)	21(100.0%)	**201**			
Mean Age ±SD (Years)		64.0±10.1	65.0±9.13				0.80
Sex	Male	159	12				1.00
	Female	120	9				

RR=Relative risk

Table 4: Association of Middle Cerebral Versus Anterior Cerebral Infarcts with Outcome

Outcome		Location			RR	95.0% CI	P value
		MCA (n=225)	ACA (n=54)	Total (n=279)			
Risk of aspiration on day 1	Yes	99(44.0%)	5(9.3%)	**104**	4.76	2.04-11.09	<0.001
	No	126(56.0%)	49(90.7%)	**175**			
Extended risk of aspiration on day 7	Yes	96(42.7%)	3(5.6%)	**99**	7.68	2.53-23.31	<0.001
	No	129(57.3%)	51(94.4%)	**201**			
Mean Age ±SD (Years)		63.0 ± 8.12	64.2 ± 8.56				0.61
Sex	Male	129	30				0.81
	Female	96	24				

RR=Relative risk

with relative risk 3.91 which was statistically significant (95.0% CI 1.04-14.76, p=0.01). Total 99 study subjects (33.0%) had extended risk of aspiration at day 7. Extended risk of aspiration on day 7 was also found in higher proportion in anterior circulation infarction patients (relative risk 15.64) which was also statistically significant (95% CI 1.01-243.30, p=0.001) (Table 3).

Table 4 compares the proportion of risk of aspiration on day 1 and day 7, between patients with middle cerebral and anterior cerebral infarcts. Middle cerebral infarcts were associated with higher proportion of risk of aspiration on day 1 with relative risk 4.76 which was statistically significant (95% CI 2.04-11.09, p-value <0.001). Extended risk of aspiration on day 7 was also found in higher proportion in middle cerebral infarcts (relative risk 7.68) which was also statistically significant (95% CI 2.53-23.31, p-value <0.001). There was no statistically significant age and sex difference between the two groups.

Discussion

In this study 300 patients of cerebral infarcts were included. Most (55 percent) of the patients were of more than 50 years age. Mean age was 64.0 ± 9.9 years. The age distribution was similar to that of most of the previous studies conducted in Bangladesh[13,14] and India[15,16]. The youngest and oldest patients were of 42 and 85 years respectively. Number of males (56 percent) was more than that of females (44 percent). Similar sex distribution was found in the study on hemispheric infacrcts patients in Bern, Switzerland[11].

Majority of the cases had hypertension as risk factors (75.0%). This finding is consistent with that of Singh[17]. Smoking was found in 52.0% patients, which was lower than the findings in most of the previous studies[18,19]. This can be explained by the low smoking rate in females in Bangladesh in comparison to the western world, where most of those studies were conducted.

Hemiplegia/paresis was the most frequent presenting feature (68.0%) followed by aphasia/dysphasia and monoplegia/paresis (19.0% each). Headache, incontinence of urine, hemisensory loss and hemianopia were not common presenting features. Siddique found similar results in ischaemic stroke patients[3], except deteriorated consciousness. Exclusion of impaired consciousness explains this discrepancy.

Middle cerebral artery (MCA) was the most favoured territory (75.0%) in this study, like described by Rovira[20]. Most of the infarcts were cortical (58.0%). Subcortical infarcts comprised 42.0% patients, most of which in MCA territory (93.0%). Paciaroni found similar anatomical distribution in a study on Italian population[6].

Regaring overall outcome, risk of aspiration was found in 32.0% patients, of which 14.0% was proved to have extended risk at day 7. Most of the patients having extended or transient had subcortical infarcts involving MCA territory. This is consistent with most other studies[11,21].

Anterior circulation infarcts were associated with higher proportion of risk of aspiration, both transient and extended than posterior circulation infarcts. This finding was consistent with the study by Gonzalez-Fernandez[21]. Middle cerebral arterial infarcts were found to have higher risk of aspiration than anterior cerebral arterial infarcts. Galovic et al[11] and Alberts et al[22] found similar results.

The study has its limitations also. It was based on calculation of the risk of aspiration, not the number of patients who developed aspiration. Dysphagia was assessed clinically. Fluoroscopic study of swallowing would have given more accurate results.

Conclusion

In conclusion anterior circulation infarcts and middle cerebral arterial infarcts are associated with higher risk of aspiration pneumonia in hemispheric infarction. Further research on this topic with a larger sample is recommended.

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Original Article

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Pattern of Thyroid Disorders among Thyroidectomy Patients: Experience at a Tertiary Care Hospital

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Abstract

Background: Thyroid dysfunction is one of the common abnormalities.**Objective:** The purpose of the present study was to see the pattern of thyroid disorders among thyroidectomy patients at a tertiary care hospital. **Methodology:** This cross sectional study was conducted in the Department of Otolaryngology and Head-Neck surgery at Sylhet MAG Osmani Medical College Hospital, Sylhet, Bangladesh from January 2004 to December 2004 for a period of one (01) year. All the patients presented with various pathological conditions of thyroid gland at any age with both sexes were selected as study population. The diagnosis of the thyroid dysfunction were confirmed by a number of investigations including FNAC, thyroid function tests and ultrasonography. **Result:** A total number of 32 patients were recruited for this after fulfilling the inclusion and exclusion criteria. In this series lowest age was 16 years and highest were 70 years and the average age was 39.8±11.65 years. In this series, out of 32 patients, nontoxic nodular goitre was the most common which was 23(71.9%) patients presented with. Total number of patients with thyroid cancer with or without metastasis was 5(15.7%) cases. Incidence of toxic nodular goitre and toxic adenoma were found in 1(3.125%) case each. The hemithyroidectomy was carried out in 16 patients of nontoxic multi-nodular goitre affecting the right lobe or the left lobe, 1 patient with toxic adenoma and 1 patient with follicular adenoma, with a total of unilateral resection in 22 cases. Bilateral resection was carried out in rest 10 cases. **Conclusion:** In conclusion nontoxic nodular goiter is the most common thyroid disorder followed by thyroid cancer with or without metastasis. *[J Monno Med Coll December 2018;4(2): 42-45]*

Keywords: Pattern; thyroid disorders; thyroidectomy patients; Bangladesh

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Introduction

Thyroid disorders are commonly encountered in clinical practice. It is the second-most common endocrine disease worldwide[1]. Currently, there has been increased interest in the prevalence data of thyroid disease as because this thyroid disorders accelerate the cardiovascular complications[2]. Thyroid disorders may present as a derangement of thyroid hormone secretion, thyroid enlargement or pain. There are varieties of thyroid disorders. Some of these are managed by medication and some of these are surgical. These are hypothyroidism or hyperthyroidism, simple nodular enlargement, neoplastic enlargement and thyroiditis[3]. There are also some developmental abnormalities which are rare. These include lingual thyroid, absence or hypoplasia. The common causes of hyperthyroidism are Grave's disease, toxic multinodular goitre and solitary toxic adenoma. Less common causes are thyroid carcinoma, excessive ingestion of thyroid hormone and struma ovarii[4]. However, the important cause of hypothyroidism is Hashimoto's thyroiditis whereas less common causes are hypopituitarism and developmental abnormalities.

The spectrum of thyroid enlargements includes solitary

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thyroid nodules which may be caused by cysts, adenomas and malignancy and the non-toxic multinodular goitres[5]. Pain may be caused by infective thyroiditis and haemorrhage into an adenoma. Thyroid enlargements are more common in females and most of them present in the clinics for cosmetic reasons. Nearly, one-third of the population of the world inhabit areas of iodine deficiency and the prevalence of goitre in areas of deficiency can be as high as 80% cases[6]. In this regards, this present study was undertaken to see the pattern of thyroid disorders among thyroidectomy patients at a tertiary care hospital.

Methodology

This descriptive cross sectional study was conducted in the Department of Otolaryngology and Head-Neck surgery at MAG Osmani Medical College Hospital, Sylhet, Bangladesh from January 2004 to December 2004 for a period of one (01) year. This study place was of the one of the largest public hospital in Bangladesh which was located 300 km northeast of Bangladesh. This hospital represented one of the largest part of Bangladeshi people. This centre had a tertiary clinical laboratory and both routine and specialized biochemical and endocrinological tests were undertaken including thyroid function tests. All the patients presented with various pathological conditions of thyroid gland at any age with both sexes were selected as study population. The diagnosis of the thyroid dysfunction were confirmed by a number of investigations including FNAC, thyroid function tests and ultrasonography. The study protocol was approved by the Ethical Research and Review Committee of the institution. Purposive sampling procedure was used for this study. This involved the enrollment of patients that underwent thyroid function testing at the tertiary care clinical laboratory. The sample size for the study consisted of the total number of thyroid function test results of patients that fulfilled the selection criteria. Only thyroid function test results within the period were selected. A questionnaire was designed for collection of data with respect to age and gender of the patients. The thyroid function test results consisting of either serum total thyroxine (TT_4) or free thyroxine (FT_3), total triodothyronine (TT_3) or free tridothyronine (FT_3), and thyroid-stimulating hormone (TSH) values were evaluated for the diagnosis of thyroid disorders. Serum samples of patients were tested within 1-hour of sample collection using automated immunoassay analyzer. The tests were performed using highly sensitive chemilumnescent immunoassays (CLIA). For all the parameters like TT_3, FT_3, TT_4, FT_4, and TSH, both low and high quality control sera were ran together with each batch of patient samples after instrument calibration. Histopathological test was done after collection of biopsy material after surgery to confirm the different pathological abnormalities. Analyses was performed by SPSS software, versions 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Continuous data that were normally distributed were summarized in terms of the mean, standard deviation, median, minimum, maximum and number of observations. Categorical or discrete data were summarized in terms of frequency counts and percentages.

Results

A total number of 32 patients were recruited for this after fulfilling the inclusion and exclusion criteria. In this study maximum age range was from 21 to 40 years which was 19(59.4%) cases followed by 41 to 50 years and 61 to 70 years which were 4(12.5%) cases in each. In this series lowest age was 16 years and highest were 70 years and the average age was 39.8±11.65 years (Table 1).

Table 1: Age of Patient with Thyroid Disorder (n=32)

Age Group	Frequency	Percent
10 to 20 Years	2	6.2
21 to 30 Years	8	25.0
31 to 40 Years	11	34.4
41 to 50 Years	4	12.5
51 to 60 Years	3	9.4
61 to 70 Years	4	12.5
Total	**32**	**100.0**

In this study female was predominant than male which was 22(68.7%) cases and 10(31.3%) cases respectively. Female to male ratio in this series was 2.2:1 (Table 2).

Table 2: Gender Distribution of Study Population (n=32)

Gender	Frequency	Percent
Male	10	31.3
Female	22	68.7
Total	**32**	**100.0**

In this series, out of 32 patients, nontoxic nodular goitre was the most common which was 23(71.9%) patients presented with. Total number of patients with thyroid cancer with or without metastasis was 5(15.7%) cases. Incidence of toxic nodular goitre and toxic adenoma were found in 1(3.125%) case each. Out of 5 patients of thyroid cancer, 4 patients had papillary carcinoma (80%) and one patient had mixed papillary and follicular (20%) which was confirmed by histopathological examination (Table 3).

Table 3: Types of Thyroid Disorder among Study Population (n=32)

Gender	Frequency	Percent
Nontoxic nodular goitre	23	71.9
Toxic nodular goitre	1	3.1
Toxic adenoma	1	3.1
Nodular goitre with Rt.V.Cord palsy	1	3.1
Carcinoma thyroid with metastasis	1	3.1
Carcinoma thyroid without metastasis	4	12.6
Follicular adenoma	1	3.1
Total	**32**	**100.0**

Table 4: Different Types of Operation among Thyroidectomy Patients(n=32)

Diagnosis	Lobectomy	Hemi	Subtotal	Neartotal	Totalwithout Blockdissect	Totalwith Blockdissection	Completion	Total
Nontoxic Nodular Goitre	3	16	1	2	1	0	0	23
Toxic Nodular Goitre	0	0	1	0	0	0	0	1
Toxic Adenoma	0	1	0	0	0	0	0	1
Nodular goitre with Rt. V. Cord palsy	0	0	0	0	1	0	0	1
Carcinoma Thyroid With Metastasis	0	0	0	0	0	1	0	1
Carcinoma Thyroid Without Metastasis	0	0	0	1	2	0	1	4
Follicular Adenoma	0	1	0	0	0	0	0	1
Total	**3**	**18**	**2**	**3**	4	**1**	**1**	**32**

The hemithyroidectomy was carried out in 16 patients of nontoxic multi-nodular goitre affecting the right lobe or the left lobe, 1 patient with toxic adenoma and 1 patient with follicular adenoma, with a total of unilateral resection in 22 cases. Bilateral resection was carried out in rest 10 cases. In thyroid cancer, near total thyroidectomy, in which a thin strips of thyroid tissue were preserved on the contra lateral side to protect the blood supply to one or more parathyroid glands, were carried out and in 1 out of 5 cases of thyroid cancer, block dissection of cervical lymph nodes were also made (Table 4).

Discussion

Thyroid disorders are the second most common endocrine problems after diabetes mellitus and usually present with enlargement of the thyroid gland or sometimes pain[6]. Pain may be as a result of infection or haemorrhage into an adenoma. Sometimes, they present with derangement of hormone secretion resulting in hyperthyroidism. Most cases of hyperthyroidism are easily diagnosed clinically and if left untreated may cause progressive catabolic disturbances and cardiac damage leading to poor quality of life[7].

In this study, 32 patients were included who had undergone surgical treatment for various thyroid disorders in Otolaryngology department of Osmani Medical college hospital, Sylhet. The diagnosis of the thyroid disorder cases have been established preoperatively by FNAC and various thyroid function tests and later confirmed by histopathological examination.

In this study maximum age range was from 21 to 40 years which was 19(59.4%) cases followed by 41 to 50 years and 61 to 70 years which were 4(12.5%) cases in each. In this series lowest age was 16 years and highest were 70 years and the average age was 39.8±11.65 years. The similar result has been reported by Rahaman[7]. In this study female was predominant than male which was 22(68.7%) cases and 10(31.3%) cases respectively. Female to male ratio in this series was 2.2:1. Thyroid disease was prevalent among female. Therefore, there is a female preponderance that is fairly consistent with the study by Rahaman[7]. Other studies have been reported similar result and have mentioned that female are more commonly suffering from thyroid diseases[8-9]. The age group of 21 to 40 years is the highest prevalence of goitrous lesions. This is similar to the findings in other studies[9].

In this series, out of 32 patients, nontoxic nodular goitre was the most common which was 23(71.9%) patients presented with. Total number of patients with thyroid cancer with or without metastasis was 5(15.7%) cases. Incidence of toxic nodular goitre and toxic adenoma were found in 1(3.125%) case each. Out of 5 patients of thyroid cancer, 4 patients had papillary carcinoma (80%) and one patient had mixed papillary and follicular (20%) which was confirmed by histopathological examination. The distribution of thyroid disorders in this study shows that the most common clinical diagnosis is nontoxic nodular goitre followed in decreasing order by toxic goitre 6.2%, malignancy 15.7%, hypothyroidism 1.7% and thyroiditis 0.6%. Relative incidence of papillary carcinoma is much higher than that of follicular carcinoma in this series and is close to other study[8]. The prevalence of malignancy and thyroiditis in this study is low compared to the findings in other studies[10-13]. The only case of thyroiditis in the study was in an HIV-positive patient who developed bacterial thyroiditis in a simple goitre while awaiting surgery. The infection resolved with antibiotics after which the patient defaulted. Thyroid abscess is not commonly reported in patients who are HIV positive[14]. This association highlights immunosuppression as an important factor in the development of thyroiditis.

Hemithyroidectomy was performed in total 18 patients, 16 with nontoxic nodular goitre affecting predominantly one lobe, one patient with toxic adenoma and one patient with follicular adenoma. Lobectomy was done in 3 patients of nontoxic nodular goitre. Completion thyroidectomy was performed in one case. Subtotal thyroidectomy was performed in 2 cases, one for non-toxic nodular goitre and another for toxic nodular goitre. Near total thyroidectomy was done in 3 cases, 2 for nontoxic nodular goitre and one for carcinoma thyroid without neck node metastasis. Total thyroidectomy without block dissection was done in 4 cases and with block dissection in one case. So unilateral resections were done in 22 cases and bilateral resections were done in 10 cases. Thirty two patients had surgery out of which 29(90.64%) had histological confirmation. The most common histological diagnosis was multinodular

goitre (75.86%) followed by follicular adenoma (3.45%) which is similar to the findings by other authors[9,11,15]. Toxic goitre is confirmed by histological diagnosis in 1 (3.45%) of the patients that had surgery. This low prevalence is similar to findings in earlier studies where prevalence ranged from 5.4% to 13%. The clinical diagnosis of toxic goitre was 6.2% in the study population. This low percentage of histological diagnosis when compared to the clinical diagnosis is a reflection of the rate of surgery for toxic goitre in this facility which is probably related to the efficacy of medical treatment for thyrotoxicosis.

Conclusion

In conclusion nontoxic nodular goiter is the most common thyroid disorder among the thyroidectomy patients. Furthermore thyroid cancer with or without metastasis is the second most common disorder who are undergone thyroidectomy surgery. Concluding, simple goitre is the most common form of thyroid disorder and predominant in the female sex. It is not common at the extremes of life. There are differences in disease spectrum depending on the specialty where the study is carried out. A prospective study on autoimmunity and goitrogens are required to further elucidate the causes of this sex predominance as well as determine other possible etiological factors. This will help outline plans for prevention, early diagnosis and management of the common thyroid disorders.

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Review Article

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Current Epidemiology of Methicillin-Resistant Staphylococcus aureus (MRSA): A Review

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Abstract

Staphylococcus aureus is the most commonly isolated human bacterial pathogen and is an important cause of skin and soft tissue infections (SSTIs), endovascular infections, pneumonia, septic arthritis, endocarditis, osteomyelitis, foreign-body infections, and sepsis. Methicillin-resistant *S. aureus*(MRSA) isolates are resistant to all available penicillin and other beta-lactam antimicrobial drugs. They were once confined largely to hospitals, other health care environments, and patients frequenting these facilities. Since the mid-1990s, however, there has been an explosion in the number of MRSA infections reported for populations lacking risk factors for exposure to the health care system. This increase has been associated with the recognition of new MRSA strains, often called community associated MRSA (CA-MRSA) strains that have been responsible for a large proportion of the increased disease burden observed in the last decade. These CA-MRSA strains appear to have rapidly disseminated among the general population in most areas of the United States and affect patients with and without exposure to the health care environment. *[J Monno Med Coll December 2018;4(2): 46-50]*

Keywords: Current trend; Epidemiology; Methicillin-Resistant; Staphylococcus aureus; MRSA

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Introduction

Soon after the introduction of methicillin, strains of *Staphylococcus aureus* that were resistant to methicillin were identified in the United Kingdom[1]. Methicillin is the first beta-lactamase-resistant penicillin. From the 1960s into the early 1970s, MRSA infections in Europe were limited largely to hospital outbreaks caused predominantly by *Staphylococcus aureus* phage type 83A subsequently identified to be sequence type 250 [ST250][2]. In the United Kingdom[3], MRSA is rare until the early 1990s and has since increased gradually in frequency as a nosocomial pathogen. The first case of MRSA infection has been recorded in Australia[4] in 1965. Most Australian nosocomial MRSA isolates had a distinctive antibiogram, with resistance to trimethoprim-sulfamethoxazole (TMP-SMX), erythromycin, clindamycin, tetracycline, and gentamicin[5]. A similar large increase has been documented among outpatients during this period suggesting a rapid dissemination of the non MDR MRSA strains[6].

Epidemiology

The rates of inpatient bloodstream infection and other sites of infection caused by any MRSA strain decreased by 35% and 26%, respectively, while among outpatients, the rates increased by 31% and 224%, respectively[7]. In Japan[8], MRSA isolates have been prevalent in academic hospitals and spread into community hospitals. In contrast, in Finland, Norway, Sweden, the Netherlands, and Denmark, MRSA infections have remained rare even in the health care setting, which has been attributed by many to strict surveillance programs that have been the norm for decades in each of these nations[9]. MRSA gradually became entrenched as an endemic pathogen in large, urban, university hospitals in the United States, particularly in intensive care units (ICUs). Subsequently, the percentage of *Staphylococcus aureus* isolates from hospitalized patients in the United States that were resistant to methicillin increased from 2.4% in 1975 to 29% in 1991[10]. The annual average percentage of *Staphylococcus aureus* isolates that were MRSA increased further to 51.6% of ICU

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and 42% of inpatient non-ICU *Staphylococcus aureus* isolates[11]. Similar persistently high or increasing rates of MRSA among *Staphylococcus aureus* isolates have also been observed for health care settings in many other regions of the world. Investigation into the epidemiology of MRSA was limited largely to the health care setting because it was rare that MRSA strains would infect otherwise healthy people. The recognized risk factors then identified for MRSA infection and colonization included recent hospitalization; other exposures to the health care system; residence in a long term care facility[10] or an acute-rehabilitation unit; the presence of an indwelling line or catheter; surgical wounds; chronic liver, lung, or vascular disease; malignancy; recent exposure to antibiotics; intravenous drug use[11]; ICU admission; and exposure to a patient with any of these risk factors for MRSA[8].

Case Definition of HA-MRSA

Health care associated MRSA cases are defined as patients with an MRSA infection identified after 48 hours of admission to a hospital; a history of hospitalization, surgery, dialysis, or residence in a long-term care facility within 1 year of the MRSA culture date; a permanent indwelling catheter or percutaneous medical device like tracheostomy tube, gastrostomy tube, or Foley catheter present at the time of culture; or a known positive culture for MRSA prior to the study period. Cases that had none of the above features were classified as community-associated[7].

Case Definition of CA-MRSA

The CDC created a case definition for a CA-MRSA infection: any MRSA infection diagnosed for an outpatient or within 48 hour of hospitalization if the patient lacks the following health care-associated MRSA risk factors: hemodialysis, surgery, residence in a long-term care facility or hospitalization during the previous year, the presence of an indwelling catheter or a percutaneous device at the time of culture, or previous isolation of MRSA from the patient[12].

Difference between HA-MRSA and CA-MRSA

The distinctions between CA-MRSA and HA-MRSA isolates[2] have become increasingly blurred since about 2003. Defining a case as being community acquired is usually based on the timing of isolation of MRSA in relation to the time of hospitalization. As a result, the vast majority of cases attributed to community-acquired MRSA are associated with recent direct or indirect exposure to the health-care setting like hospitalization, outpatient visit, nursing home admission, antibiotic exposure, chronic illness, or close contact with people with these risk factors which are suggesting that these infections are caused by nosocomial strains that have been carried into the community. These isolates circulate in the community especially among adults[12]. In addition to that, many reports have demonstrated the MRSA clones bearing SCCmec type IV especially USA300[13]. PFGE types of CA-MRSA now cause nosocomial MRSA outbreaks and infections among patients with chronic illnesses in the developed countries like Taiwan[9]. In USA[13], it is reported that 34% of nosocomially transmitted isolates belonged to the USA300 CA-MRSA genotype. A study of surgical skin site infections from 2004 to 2005 in USA demonstrated that USA300 was a common nosocomial pathogen[4] which was first appeared in this setting in 2004. The appearance of CA-MRSA strains in hospitals in the United States is likely responsible for the decreasing non-beta-lactam antimicrobial resistance rates noted for MRSA isolates in ICUs[13]. The presence of USA300 increased among MRSA isolates from a 1,000-bed long-term care facility from 11.3% in 2002 to 64% in 2006 which was reported in USA[14].

Molecular Difference between HA-MRSA & CA-MRSA

CA-MRSA strains have been distinguished from their health care-associated MRSA (HA-MRSA) counter-parts by molecular means[15]. They are often resistant to many classes of non-beta-lactam antimicrobials. HA-MRSA strains seldom carry the genes for the Panton-Valentine leukocidin (PVL). In contrast, CA-MRSA isolates carry smaller SCC*mec*elements, most commonly SCC*mec*type IV or type V. These smaller elements also carry the *mec*Agene and are presumably more mobile, although few explicit data support this notion[13]. They are resistant to fewer non-beta-lactam classes of antimicrobials and frequently carry PVL genes. In addition to these genotypic characteristics, CA-MRSA strains affect a population distinct from those affected by HA-MRSA and cause distinct clinical syndromes. CA-MRSA infections tend to occur in previously healthy younger patients. They have been associated predominantly with SSTIs but have also been linked to several severe clinical syndromes such as necrotizing pneumonia and severe sepsis[11]. In contrast, HA-MRSA strains have been isolated largely from people who are exposed to the health care setting; the patients are older and have one or more comorbid conditions. HA-MRSA strains tend to cause pneumonia, bacteremia, and invasive infections.

Types of Infection

The clinical diagnosis of an SSTI presenting as an abscess is straight forward. Pain, tenderness, erythema and swelling are common in SSTIs and offer around a 93% to 97% sensitivity in the clinical diagnosis of cellulites[15]. The most likely microbial cause of this is *S. aureus*, although *pyogenic streptococci* like beta-haemolytic *Streptococci* such as *Streptococcus pyogenes*, and group C or G *Streptococci* are other possibilities[16]. The spectrum of disease caused by CA-MRSA appears to be similar to that caused by CA-MSSA. Furuncles, carbuncles and other abscesses appear to be the most frequently reported clinical manifestations. They may or may not have accompanying cellulitis. Erythematous papules and nodules, folliculitis and/or impetigo are less common presentations. One specific presentation appears to be typical of cutaneous CA-MRSA

infections. This is the spontaneous appearance of a raised tender red lesion, which may progress to develop a necrotic centre. This may lead to the suspicion of a 'spider bite' where such occurrences are common like North America or Australia[17]. Most reports of such lesions have come from the USA and have not been as frequently reported from other countries[11]. In the UK[15], where spider bites are rare, these 'dermatonecrotic' lesions increase the likelihood of a diagnosis of CA-MRSA but are not pathognomic. They can also be found in infections due to PVL-positive MSSA strains. Many other severe cutaneous complications of CA-MRSA have been reported and include extensive cellulitis, necrotizing fasciitis and purpura fulminans[16]. No particular patterns of clinical presentation have yet emerged to allow differentiation from MSSA infections.

Evolution of Methicillin Resistance: Genetic Perspective

Penicillin resistant *S aureusis* now widespread and may be conferred by the production of a beta-lactamase coded by the blaZ gene[1]. Methicillin resistance results from the production of an altered penicillin binding protein known as PBP2a and it has decreased affinity for most beta-lactam antibiotics[13]. The *mecA* gene encodes PBP2a and it is carried on a mobile genetic element known as the *staphylococcal* cassette chromosome (*SCC*) *mec*[18]. Besides the *mecA* gene itself, the *SCCmec* element contains regulatory genes, an insertion sequence element (IS431*mec*), and a unique cassette of recombinase genes (ccr) responsible for the integration and excision of *SCCmec*[19]. Strains of community-acquired MRSA that have emerged over the past decade have mostly harbored the *SCCmec* type IV element[20] and they are typically susceptible to multiple antibiotics with non-beta-lactam susceptibility patterns resembling those of methicillin-susceptible *Staphylococcus aureus*(MSSA) strains prevalent in the community[1]. Besides intra-species transfer of resistant determinants other commensal *Staphylococcal* species may act as a reservoir for antibiotic resistance islands that may be transferred to *S aureus*[1]. These elements share most of the essential characteristics of *SCCmec*, including regulatory genes and insertion sequences, but lack the *mecA* gene[11].

Global Burden of CA-MRSA Infection

The application of the definition to the cases of infection with MRSA with onset in the community accurately identifies patients with infections caused by CA-MRSA isolates[21]. However, if one uses the case definition to identify patients with infection caused by CA-MRSA isolates, the burden of disease caused by CA-MRSA isolates will be greatly underestimated and this analysis yields a reciprocal overestimation of health care-associated MRSA disease[2]. If the CDC case definition of CA-MRSA were used in the acute-care setting to aid in the selection of empiric antibiotic therapy, many people who could be managed with clindamycin, would be unnecessarily treated with intravenous antimicrobial drugs because they have an illness caused by a CA-MRSA isolate and not a multiple resistant HA-MRSA isolate[15].

Clinical Burden of MRSA Infection in Bangladesh

Several studies have been done in Bangladesh to see the burden of MRSA infection with their sensitivity pattern. Haqueet al22 has reported that the current prevalence of β-lactamase-producing methicillin-resistant *S. aureus* (MRSA) in clinical samples is 43.7% isolates. This study was carried out in the two private clinics at Dhaka city. In another study Alam et al[23] has investigated the distribution of the *mecA* gene in a total of 94 clinical strains of *S. aureus* which are isolated from both man and animal admitted in Bangladeshi Medical Hospital as well as Veterinary clinic. The *mecA* gene was detected by PCR in 25.0% of human clinical isolates of *S. aureus*, whereas not a single *mecA* gene was detected in animal isolates of *S. aureus*. Hossain et al[24] has done an antimicrobial susceptibility testing against *Staphylococcus aureus* isolated at a tertiary care hospital outside Dhaka and found a high rate of MRSA isolates. Begum et al[25] has reported eight *Staphylococcus aureus* isolates from different specimens and surprisingly has found no MRSA strains. The reason may be due to small sample size and the study was performed 14 years back. However, among the all *S aureus*[2] strains are resistant tooxacillin which is very rare. Khan et al[26] has performed antimicrobial susceptibility testing and coagulase typing of *Staphylococcus aureus* isolates, with particular emphasis to Methicillin Resistant *S. aureus* (MRSA) among strains isolated from various types of specimens collected at a tertiary care hospital outside Dhaka. A newly developed panel of anti-sera against different coagulase enzymes was used for coagulase typing. The study included 79 strains of *Staphylococcus aureus* and of those, 40 were identified as MRSA on the basis of resistance to oxacillin discs. The rate of resistance of *S. aureus* was 88.61% to penicillin and 48.10% to oxacillin. However, none of the isolates showed vancomycin resistance. Murshed et al[27] has compared the detection rate of MRSA between two tertiary care hospital at Dhaka city and has found a high rate of MRSA in both hospitals. Shahidullah et al[28] has reported from specialized cardiology hospital at Dhaka from different specimens and found only 6(10.5%) isolates of *S. aureus*. In this study MRSA is not detected. Ahmed et al[29] has reported aerobic bacterial agents isolated from puerperal sepsis among the patients admitted at a tertiary care hospital and found that 46.2% cases are MRSA strains. Interestingly the all strains are vancomycin sensitive. Barai et al[30] has performed a study to know the antibiotic resistance pattern of the common isolates from blood, urine, respiratory secretions and pus/wound swab of patients admitted in ICU at BIRDEM hospital, during a one year period. A total of 1660 samples were analyzed of which about 77 % of isolated S. aureus were methicillin resistant (MRSA). Jinnah et al[31] has published that 12.6% *S aureus* are isolated from wound specimens from the diabetic patients at diabetic

specialized hospital in Dhaka. Kawsar et al[32] has reported a three months long study carried out the Department of Pathology at Armed Forces Medical College and has found 50 cases of *Staphylococcus* infection of which 42(84.0%) cases are *S aureus*. Interestingly out of 42 cases of *Staphylococcus aureus* 37(85.7%) are found as beta lactamase producers and only 4.8% cases are MRSA.

CA-MRSA Infection in Bangladesh

A few researches have been done on CA-MRSA in this country. Haq et al[33] reported the findings of a multicentre study on the incidence of MRSA in Bangladesh and has mentioned that a total of 14.1% *S. aureus* was isolated from different specimens. The rates of isolation of *S. aureus* in the Dhaka hospital and outpatients were 14.1% and 11.7%, respectively, whereas rates were 20.7% in Chittagong, 14.7% in Rajshahi and 18.3% in Mymensingh. The lower rate of isolation of *S. aureus* in Dhaka hospital and the outpatients was because urine constituted 82.5% and 59.7% of samples, respectively. On the other hand, a higher rate of isolation of *S. aureus* in Chittagong, Rajshahi and Mymensingh was due to fewer urine sample and more samples of pus. The rate of isolation of MRSA in the four hospitals ranged between 32.0% and 63.00%, but was 40% in outpatient isolates of Dhaka hospital. The origin of these communities acquired MRSA is not known. One possibility is that they had come from patients who had previously been admitted to Dhaka hospital and had then been seen as outpatients. However, exact data regarding the proportion of patients with a history of hospital stay was not recorded. MRSA were detected in pus, urine and sputum. The prevalence of MRSA has increased substantially over the last 4 to 5 years in hospital patients in Bangladesh and this multicentre study showed there was a high incidence of MRSA in large hospitals in four different regions of Bangladesh and in the community in Dhaka. Iqbal et al[34] has reported a study which is the only one CA-Methicillin-resistant *Staphylococcus aureus* (CA-MRSA) related study so far. The study has documented the incidence of ciprofloxacin-resistance among MRSA in community patients. In this study clinical isolates from outdoor patients were tested to see the ciprofloxacin resistance among MRSA strains, using in vitro susceptibility tests by standard disk diffusion technique. Results show significantly high incidence of ciprofloxacin resistance among MRSA isolates in these patients.

Conclusion

In conclusion *Staphylococcus aureus* is an important cause of human bacterial infection. It causes especially skin and soft tissue infections, endovascular infections, pneumonia, septic arthritis, endocarditis, osteomyelitis, foreign-body infections, and sepsis. This bacteria becomes resistant and it develops methicillin-resistant *Staphylococcus aureus* which is resistant to all available penicillin and other beta-lactam antimicrobial drugs. These are confined mostly to hospitals, health care environments, and patients of these facilities. This increase has been associated with the recognition of new MRSA strains, often called community associated MRSA strains which appear to have rapidly disseminated among the general population and affect patients with and without exposure to the health care environment.

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Case Report

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Lateral Medullary Syndrome (Wallenberg, syndrome): A Case Report

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Abstract

The lateral medullary syndrome is a rare stroke. Sometimes it is under diagnosed by the physicians. In this case report a 45 years old male person presented with the history of sudden onset of vertigo which was associated with vomiting, dysphagia, dysarthria and ataxia of the gait. The patient was clinically and radiologically diagnosed as a case of lateral medullary syndrome (Ischaemic stroke). With treatment this patient improved significantly. It was commonly caused by occlusion of the cranial segment of the vertebral artery or the posterior inferior cerebellar artery. It should be managed with appropriate treatment and physiotherapy. *[J Monno Med Coll December 2018;4(2): 51-53]*

Keywords: Lateral medullary syndrome; Wallenberg's syndrome; Brainstem infarct; Ataxia

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Introduction

The Lateral medullary syndrome was first described in 1808 by Gaspard vieussux[1]. First descriptions by Wallenberg were in 1895 (clinical) and 1901 (autopsy findings).The lateral medullary syndrome (Wallenberg's syndrome) is most often caused by occlusion of the intracranial segment of the vertebral artery (VA), less commonly, it is caused by occlusion of the posterior inferior cerebellar artery (PICA). The syndrome is characterized by sensory deficits affecting the trunk and extremities on the opposite side of the infarction and sensory deficits affecting the face and cranial nerves on the same side with the infarct.

Specifically, there is a loss of pain and temperature sensation on the contralateral side of the body and ipsilateral side of the face. The crossed finding is diagnostic for the syndrome. Other clinical symptoms and signs are swallowing difficulties (Dysphagia)[2], slurred speech, ataxia, facial pain, vertigo, nystagmus, Horner's syndrome, diplopia and possibly palatal myoclonus. The affected persons have dysphagia resulting from involvement of the nucleus ambigus as well as dysarthria. Damage to the spinal trigeminal nucleus causes absence of pain on the ipsilateral side of the face as well as absence corneal reflex.

The spinothalamic tract is damaged, resulting in loss of pain and temperature sensation to the opposite side of the body. The damage to the cerebellum or the inferior cerebellar peduncle causes ataxia. Damage to the hypothalamo- spinal fibers disrupts sympathetic nervous system giving rise to Horner's syndrome. Nystagmus and vertigo result from involvement of vestibular nuclei. Onset is usually acute with severe vertigo. Palatal myoclonus may be due to involvement of the cranial trigeminal tract. Wallenberg's syndrome (WS) is caused by a stroke in one of the two arteries of the brainstem. The stroke associated with WS usually causes damage in the lateral medulla of the brainstem. It may also cause damage to the cerebellum. There is no specific treatment for WS. Treatment is symptomatic.

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Case Presentation

A 45 years old person, hypertensive, non-diabetic, smoker was admitted in Monno Medical College Hospital, Manikganj, Bangladesh with the complaints of sudden onset of vertigo associated with vomiting, dysphagia, dysarthria with nasal voice and unsteadiness of the gait. On examination, patient was conscious, well oriented, and co-operative. Speech was dysartharic with nasal voice. Patient had also left sided Horner's syndrome with loss of pain and temperature sensation on the left side of the face as well as absent corneal reflex, cranial nerves of IX and X palsy on the left side and presence of cerebellar signs on the left side. There was loss of pain and temperature sensation on the right side of the body with anhydrosis. All deep tendon reflexes (DTR) and plantar reflexes were normal. Pulse was 78 beat/minute and regular. Blood pressure (BP) was high(170/100 mmHg). On examination of chest, heart apex was heaving with normal heart sounds and no murmur. Lungs were clear. There was no carotid bruit. On investigations, CTscan of the brain, ECG, chest X-ray and echocardiography with color Doppler were normal. No abnormality was found in CBC. Random blood sugar (RBS) was normal (7.2 mmol//L). Fasting lipid profiles, serum creatinine (0.87 mg/L) and electrolytes was normal. He was immediately hospitalized followed by Nasogastric tube insertion done for feeding. Following CT scan of brain aspirin 75mg, and atorvastatin 10 mg were started along with physiotherapy.

Discussion

Lateral medullary syndrome is a uncommon stroke. We can diagnose the case clinically. Head imaging (CT/MRI of the brain) can confirm the diagnosis[3-5]. Lateral medullary syndrome is commonly caused by thrombosis or embolism of the VA or PICA. Generally, lesions that are related to multiple vessel involvement, dissection, and poor collateral circulation is larger than those associated with single vessel disease, atherothrombosis / cardiac embolism and good collateralization[5]. Among the symptoms and sings, dysphagia is troublesome and has been reported in 51% to 94%[3]. Patient has been widely accepted that in most cases the dysphagia in WS initially severe enough to require non-oral feeding but often improves rapidly, and the patient can return to oral feeding within 1 to 2 months after the stroke[1,6].

Although in WS the lesion due to lateral medullary infarction is unilateral, its effect on oro-pharyngeal swallowing is bilateral[7]. In Another case report done in Seyfi Demirsoy state hospital emergency medicine clinic, Izmir, Turkey a hypertensive patient presented with right hemicranial headache and hiccups was later diagnosed and treated as a case of lateral medullary syndrome[8]. The Outlook for someone with WS depends upon the size and location of the area of the brainstem damaged by the stroke. Some individuals may see a decrease in their symptoms within weeks or months following treatment. Others may be left with significant neurological disabilities for years after the initial symptoms appeared.

Figure I: showing left sided Horner's syndrome with NG tube in situ for Dysphagia

Conclusion

Most of the neurological symptoms of LMS has been recovered or completely resolved after 3 months. The patient has been reported an occasional mild headache, reduced left sided hypoesthesia. Ataxia and fall down on the left side have considerably improved. No visual abnormality has been observed in the eye and neurological examination. However, the patient report mild dry eyes. Other clinical presentations such as fine tremors in the hands, dysmetria, dizziness and dysarthria have been completely resolved.

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