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Journal of Monno Medical College (J Monno Med Coll) is a leading, open access, peer-reviewed scientific journal on medical science for rapid publication of articles published by Monno Medical College, Monno City, Gilondo, Manikgonj Bangladesh. This journal provides quick initial decisions followed by a high quality medical editing service and an excellent publishing service to its authors. This journal has been launched from June 2015 and will be continued. **J Monno Med Coll** is published 2 times per year. This journal aims to publish scientifically written, evidence-based articles from all disciplines of medical sciences and clinical practice, preventive medicine, epidemiology as well as healthcare research. There are a great scope to publish the different kinds of articles including original research papers, reviews of the specific topics, case report and short research communications. Submissions of basic and clinical research are both considered. Manuscripts should present novel findings addressing significant questions in clinical medicine research and practice, in the form of original research article, editorial, review article, short communication, case report, letter to the editor, and others. In addition to that **J Monno Med Coll** publishes studies performed by multi-center groups in the various disciplines of medicine, including clinical trials and cohort studies from large patient populations, specifically phase I, phase II, and phase III studies performed under the auspices of groups such as general clinical research centers, cooperative oncology groups, and the like. Reports of patients with common presentations or diseases, especially studies that delineate the natural history and therapy of important conditions are also published. Reviews oriented to the practicing internist and diagnostic puzzles, complete with images from a variety of specialties are also published. Careful physiological or pharmacological studies that explain normal function or the body's response to disease as well as analytic reviews such as meta-analyses and decision analyses using a formal structure to summarize an important field are acceptable to publish.

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Instructions to Author(s)

Submission of manuscript:

- 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
- Accepted papers will be acknowledged and processed further; if the papers are rejected, the decision will be communicated to the corresponding author but the manuscripts will not be returned.
- Acceptance or rejection of the manuscript would be decided after peer review/the decision of editorial team.
- Acceptance or rejection of the manuscript for publication in journal would be informed to corresponding author within 72 working hours from the time of submission

Preparing a Manuscript:

- Authors should keep their manuscripts as short as they reasonably can (the total number of words should not exceed 7500).
- Page number should appear in the upper right hand corner of each page, beginning with the title page.
- The language of manuscript must be simple and explicit.
- Author's/Co-author's name or any other identification should not appear anywhere in the body of the manuscript to facilitate blind review.

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

Reporting guidelines

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.

- CONSORT Statement (http://www.consort-statement.org/) for reporting of randomised controlled trials: please use the appropriate extension to the CONSORT statement, including the extension for writing abstracts
- 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.

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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.

Address for correspondence

The corresponding author's contact address should be given in the title page. The fax number (if available) may be mentioned. The Email ID and mobile number of the corresponding author or the contact Email ID must also be provided.

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.

Key words: A list of 3-7 keywords should be provided which will help readers or indexing agencies in cross-indexing the study. The words found in title may be given as key words. All keywords should be provided according to MeSH terms at: http://www.nlm.nih.gov/mesh/MBrowser.html. Note that the preferred expression is indicated by the label "MeSH Heading" and not "Entry Term." The desired terms may then be copied from the MeSH Browser. Another way of finding appropriate headings is to search PubMed to find articles on similar topics, and review the MeSH headings assigned to those articles.

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.

Results

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.

Discussion

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.

Conclusion

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

It should begin on a new page. Avoid citing abstracts as references. Papers which have been submitted and accepted but not yet published may be included in the list of references with the name of the journal and indicated as “In press”. A photocopy of the acceptance letter should be submitted with the manuscript. Information from manuscript “submitted” but “not yet accepted” should not be included. Avoid using abstracts as references. The “unpublished observations” and “personal communications” may not be used as references but may be inserted (in parentheses) in the text. References are to be cited in the text by superscripted number and should be in the order in which they appear. References cited only in tables or in legends to figures should be numbered in accordance with a sequence established by the first identification in the text of the particular table or illustration. The references must be verified by the author(s) against the original documents. The list of references should be typed double spaced following the Vancouver style. Examples are given below.

Tables

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?

Figures

Each figure must be numbered and a short descriptive caption must be provided. All significant results should be indicated using asterisks. For graphs and flow charts, it is not necessary to submit the photographs. A manually prepared or computer drawn figure (with good contrast) on a good quality paper is acceptable. Identify each figure/diagrams on the back with a typed label which shows the number of the figure, the name of
the leading author, the title of the manuscript and the top side of the figure. The approximate position of each figure should be marked on the margin of the text. Legends for figures should be typed under the figure if possible or on a separate sheet. Large/complex tables or figures may be submitted in "Final Print (camera ready) format" which will be scanned as such.

Check list for Figure

- Serially numbered?
- Self explanatory caption given?
- X and Y axes graduated?
- X and Y axes titled (legend)?
- Units mentioned (if necessary)?
- Different symbols/markers for different groups given?
- SD or SEM represented (graphically)?
- Statistical significance indicated?
- Approximate position in the text marked?

Systematic Review or Meta Analysis

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:

1) Context: Provide a sentence or two explaining the importance of the review question.

2) Objective: State the precise primary objective of the review. Indicate whether the review emphasizes factors such as cause, diagnosis, prognosis, therapy, or prevention and include information about the specific population, intervention, exposure, and tests or outcomes that are being reviewed.

3) Data Sources: Succinctly summarize data sources, including years searched. Include in the search the most current information possible, ideally conducting the search several months before the date of manuscript submission. Potential sources include computerized databases and published indexes, registries, abstract booklets, conference proceedings, references identified from bibliographies of pertinent articles and books, experts or research institutions active in the field, and companies or manufacturers of tests or agents being reviewed. If a bibliographic database is used, state the exact indexing terms

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.

5) Data Extraction: Describe guidelines used for abstracting data and assessing data quality and validity (such as criteria for causal inference). State the method by which the guidelines were applied (eg, independent extraction by multiple observers).

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.

7) Conclusions: Clearly state the conclusions and their applications (clinical or otherwise), limiting interpretation to the domain of the review.

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.

Review articles:

These should contain title page, abstract (need not be structured) and key words. The text proper should be written under appropriate sub-headings. The total number of text words should not exceed 10000 and the total number of figures and tables should not be more than 7.

Short communications:

The manuscript should not be divided into sub-sections. It may have up to 1200 words (including a maximum of 5 references) and one figure or one table.

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The case report should contain abstract (need not be structured), keywords, introduction, case presentation, discussion, conclusion & references (including a maximum of 20 references) in a sequential way. The number of case may be one or two, not more than three.

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- Title of manuscript
- Full name(s) and affiliations of author(s); institution(s) and city(ies) from which the work originated.
- Name, address, telephone and fax numbers and e-mail address of corresponding author
- Running title

- Number of pages, number of figures and number of tables.
- Abstract- in structured (not in Review article, case report, short communication) form along with title, key words and running title.
- Article (double spaced)
- Acknowledgements (separate sheet)
- References (Vancouver Style)
- Tables
- Figures/photographs and legends
- Permissions to reproduce published material
- Ethical committee clearance certificate (as and whenever applicable)

Examples of References - Vancouver Style

From Uniform Requirements for Manuscripts, www.icmje.org

Articles in Journals

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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Checklist (to be tick marked, as applicable and one copy attached with the manuscript)

MANUSCRIPT TITLE

Covering letter

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2. drafting the article or revising it critically for important intellectual content; and
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Editorial
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Importance of Accreditation of Medical Colleges by World Federation for Medical Education to Establish Quality Assurance to attain Standard of the Medical Graduates

Aktaruzzaman M

World Health Organization (WHO), early in its history, has recognized the need for a reliable list of all of the world's medical college to document. With the support of member states, the first edition of the WHO World Directory of Medical Schools has been published in 1953. Successive editions are published until the seventh and final print edition has published in 2000. From 2000 to 2007, WHO has published the directory electronically along with updates received after the 2000 print publication.

In August 2007, WHO has signed an agreement with the University of Copenhagen to transfer responsibility for the development and maintenance of the directory. From then the Avicenna Directory is managed by the World Federation for Medical Education (WFME). The Avicenna Directory has opened in 2008, and has been maintained by WFME from that date until the end of 2013. The Avicenna Directory project is a public database of worldwide medical schools, schools of pharmacy, schools of public health and educational institutions of other academic health professions. The project is so named after Avicenna, a Persian physician and philosopher born near Bukhara in the 10th century.

The formation of the new World Directory of Medical Schools brings together the two existing world-wide directories of medical schools, Avicenna and IMED. The decision to merge the two directories followed a meeting of the interested parties in Copenhagen in September 2010. A Collaboration Agreement between WFME and FAIMER about this merger was finalized in March 2012. Representatives of both partner and sponsor organizations have met annually since 2013 to discuss details relating to the principles and operation of the World Directory, including the core data to be included on each medical school record, and the management and supervisory structure for the directory.

For more than 50 years, ECFMG has promoted quality health care for the public by certifying IMGs for entry into US graduate medical education (GME). ECFMG and its organizational members define an IMG as a physician who received his/her basic medical degree or qualification from a medical school located outside the United States and Canada. Through its program of IMG certification, ECFMG assesses whether these physicians are ready to enter U.S. GME; ECFMG Certification is a requirement for IMGs who wish to enter such programs. ECFMG Certification is also one of the eligibility requirements for IMGs to take Step 3 of the United States Medical Licensing Examination® (USMLE®). Finally, medical licensing authorities in the United States require ECFMG Certification, among other requirements, for IMGs to obtain an unrestricted license to practice medicine. In short, the ability to achieve ECFMG Certification is a key determinant of IMGs' readiness to enter the US health care system.

ECFMG's decision to require medical school accreditation as a requirement for ECFMG Certification is a significant step in its continuing efforts to enhance protection of the public. This requirement will catalyze efforts to accredit medical education internationally, encouraging the development of a formal process that utilizes globally accepted criteria. Such a process will have the effect of harmonizing accreditation standards, and creating a meaningful international accreditation system that will improve the quality of medical education and health care worldwide. A system that recognizes the accreditors, who in turn accredit individual medical schools, is a viable model that employs unified standards, while allowing for necessary regional variation. WFME has established standards that could be used for this purpose and, through its upcoming pilot, is establishing the necessary procedures and a working model for accrediting bodies and medical schools that wish to attain a new standard of quality medical education and meet the accreditation requirement for ECFMG Certification.

In July 2010, the Educational Commission for Foreign Medical Graduates (ECFMG®) determined that, effective in 2023, physicians applying for ECFMG Certification will be required to graduate from a medical school that has been appropriately accredited. To satisfy this requirement, an applicant's medical school must be accredited through a

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formal process that uses criteria comparable to those established for U.S. medical schools by the Liaison Committee on Medical Education (LCME) or that uses other globally accepted criteria, such as those put forth by the World Federation for Medical Education (WFME).

Unlike in the United States and Canada, where LCME and the Committee on Accreditation of Canadian Medical Schools (CACMS) set standards for, evaluate, and accredit medical schools and programs, there are no universally accepted standards for evaluating undergraduate medical education internationally. An accreditation system comprised of rigorous standards and procedures helps ensure quality medical education, and quality medical education leads to quality health care. After several years of discussions, the ECFMG Board of Trustees has determined that it can enhance its protection of the public by incorporating medical school accreditation using globally accepted criteria into ECFMG's requirements for certification of international medical graduates (IMGs). Recognizing, however, that the efficacy of such a requirement depends on a universally accepted accreditation process, which does not currently exist, this requirement is not scheduled to take effect until 2023.

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Original Article

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Evaluation of Analgesic Effects of Combined Administration of Alfa-Tocopherol and Diclofenac in Experimental Rats

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Abstract

Background: Concerning the different effects of α-tocopherol on human body including pain killing effect, the present study was carried out to investigate the analgesic property of combined administration diclofenac sodium and α-tocopherol. The purpose is whether combinations of diclofenac and α-tocopherol (αT) are better analgesic agent that diclofenac alone. **Objective:** To assess the effects combination of diclofenac with α-tocopherol on visceral pain. **Methods:** This animal study was conducted in the Department of Physiology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka from 1st January to 31st December 2013. 15 male Long Evans rats were studied. Antinociceptive activity was assessed by tail immersion test. The data were statistically analyzed by a computer with SPSS (Version 16.0) using ANOVA followed by Bonferroni's Post Hoc test. In the interpretation of results $p \leq 0.05$ was accepted, as the level of significance. **Results:** Combined administration of αT and diclofenac sodium significantly ($p \leq 0.001$) increased the latency timefor tail withdrawal as well as showed significant ($p \leq 0.001$) analgesic effect in comparison to controls as well as individual intervention of diclofenac sodium. **Conclusion:** From this study it may be concluded that, combined intervention of diclofenac sodium and α-tocopherol showed more antinociceptive effect than individual administration of diclofenac. *[Journal of Monno Medical College 2018;4(1): 3-5]*

Keywords: Nociceptive pain; diclofenac; α-tocopherol; tail immersion test

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Introduction

Pain is unique among all the sensory modalities as its perception alerts us to take appropriate protective response[1]. It is associated with a variety of behaviorsand etiologically it has been classified into nociceptive, inflammatory, neuropathic and functional type. Nociceptive pain is a vital physiologic sensation and act as a key early warning system against tissue damage. Nociceptive pain is caused by stimulation of peripheral nerve fibers that respond only to stimuli approaching or exceeding harmful intensity (nociceptors). According to the mode of noxious stimulation, it is classified into thermal, mechanical, chemical and electrical type[2,3]. Therefore pain measurement is necessary to detect its severity. It is also very important for selection of appropriate analgesics. For the measurement of nociceptive pain behaviors in animal model, the tail immersion test is one of the most common and useful method where tail withdrawal latency was measured in a short successive trials[4]. Pain relievers (analgesics) are the most common over-the-counter medications as because pain management is probably the major issue in the health care systems[5]. Diclofenac Sodium is a widely used NSAID which has strong anti-inflammatory, antipyretic and analgesic activities. Although analgesics may help to control pain in the

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short-term, with over-use or prolonged use they can cause unpleasant side effects, including: development of peptic ulcer and other systemic manifestations. With this purpose, now a days administration of combination of analgesics with antioxidants in pain treatment are applied to decrease the doses of analgesics and to prevent the negative impact of reactive oxygen species[6].

α-tocopherol (αT) is a naturally occurring lipid soluble anti-oxidant that protects our body from oxidative process. It is the most biologically form of vitamin E that is a fat soluble vitamin. αT also widely known to be one of the reactive oxygen species (ROS) scavengers and a drug that has been shown to reduce the pain responses induced by various causes in animal pain models and also in human[7,8]. In this study, we aimed to investigate the effects of combined intraperitoneal administration of αT and DS in nociceptive pain models in Long Evans ratsto evaluate the pain reducing efficacy of diclofenac sodium with the combination of diclofenac and α-tocopherol.

Methodology

This animal study was conducted in the Department of Physiology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from January to December 2013. Ethical permission was taken from the Institutional Review Board (IRB) of BSMMU, prior conducting the study. Fifteen (15) male Long Evans rats, weighing 180 to 250 grams were collected from Bangladesh Institute of Research and Rehabilitation for Diabetic Endocrine and Metabolic Disorders (BIRDEM), Shahbag, Dhaka. They were kept under a 12/12 hour light/dark cycle[9]. The room temperature was kept at 28ºC ±5ºC which was corresponded to the thermo-neutral zone of rats[10] at the Pain laboratory of the Department of Physiology, BSMMU. All the animals were there for consecutive 7 days prior to the experiments for acclimatization and had free access to standard laboratory food and boiled water after cooling. All the experiments were performed during the day time between 8:00AM to 1:00 PM, to avoid the circadian influences. Experiments were conducted according to the guidelines for the Animal Experimentation Ethics Committee, Institute of Cholera and Diarrhoeal Disease Research, Bangladesh.On the basis of vitamin and drug administrations, the rats were divided into three (3) groups (5 rats/group). Control group received normal saline (NS), Diclofenac treated group received diclofenac sodium (DS) at the dose of 10 mg/kg body weight, and combination treated group received combination of diclofenac sodium (DS) with α-tocopherol (αT) at the dose of 10 mg/kg body weight and 500mg/kg body weight, respectively. All the groups received single dose and equal volume (1ml) through intraperitoneal route 1 hour before the test. Just one hour after administrations, theywere subjected to tail immersion test. After the completion of experiments, all the rats were sacrificed.

Tail immersion test: On the day of experiment at first, the rat was placed in a plexiglas mechanical restrainer for initial 5 minutes for acclimatization with the tail hanging freely. Then 400 ml of preheated water (52±0.5)ºC was taken in a 500 ml glass beaker with a thermometer placed in it. After that, the distal 10 cm of the tail was immersed into that heated water and the tail withdrawal latency was recorded. The mean of 3 similar successive maneuvers (at 5 minutes interval) was noted as baseline latency (BL). Immediately after that, normal saline or DS or combined dose of DS with αT was injected intraperitonealy into the rats. One hour after administrations, the mean of 3 flicking latencies at 5 minutes interval was noted as test latency (TL). To minimize tissue damage, a maximum latency of 15 seconds was considered as cut off time (Porreca et al. 2001). The antinociceptive effect was calculated as percentage of maximum possible effect (% MPE) as follows[11]:TL= [(TL-BL)/ (CT-BL)] X 100; TL= Test latency; BL= Baseline latency; CT= Cut-off time.

Results

Antinociceptive effect: The effects of intraperitoneal (i.p) administration10 mg of DS and its combination with αT at the dose of 500 mg/kg on acute pain were evaluated on tail immersion testand illustrated in figure 1 (A) and (B). Both the study groups showed significant increment of tail withdrawal latency ($p \leq 0.001$) and analgesia ($p \leq 0.001$) in comparison to that of controls. In addition, combined administered group showed more analgesic effect in comparison to that of diclofenac alone and the difference was statistically significant ($p \leq 0.001$).

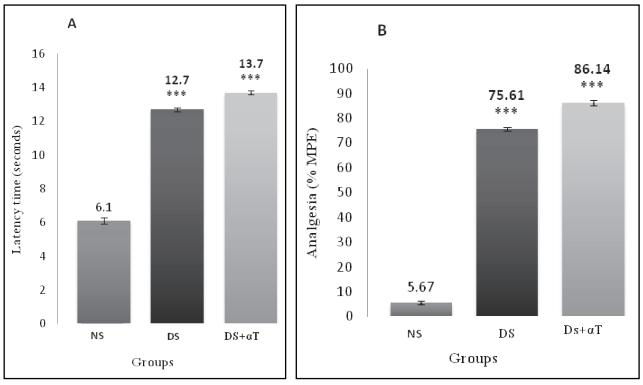

Figure I: Antinociceptive effect of the combination of diclofenac and α-tocopherol in the tail immersion test. Comparison was done including latency time (A), percentage of maximum possible effect (B). Each bar symbolizes for mean±SE for 5 rats. ***= $p \leq 0.001$ compared to control.

Discussion

Pain is not a simple process and in many instances it continues to produce severe distress that disrupted the quality of life.Sensitivity to acute thermal stimulation is the most common test used in live species pain research[12]. The behavioral reflex evoked by noxious heat stimuli is a relatively good predictor of pain sensitivity and its reduction through various analgesics.With this view, the present study has been undertaken to assess the effects of combination of diclofenac sodium (DS) with α-tocopherol (αT) on nociceptive pain.

In our study, combined administration of DS and αT

significantly lowered the nociceptive pain in comparison to that of diclofenac alone. Though the exact mechanisms of these effects could not be elucidated from this type of study, but several investigators of different countries suggested different mechanisms for the decrement of the nociceptive pain. According to them, combined administration of drug and vitamin might increase the activity of endogenous canabinoid or increment in the GABAergic or serotonergic neurons in the CNS or activate the ATP sensitive as well as voltage dependent K+ channels in the post synaptic neurons as the possible cause[13,14].

In this study, combined administration of drug and vitamin have shown more effectiveness in lowering pain and inflammation than the drug alone, as evidenced by more decrement of the study variables in the combined group. Though the mechanisms involve for lowering the pain cannot be explained exactly. However it is assumed that the above mentioned mechanisms may influence for lowering of the variables. This may be due to activation of different pain lowering pathway after administration αT and DS as both the mechanisms were involved and added together and causes more effectiveness.

Conclusion

The findings of the present study indicate that combined administration of αT and DS are better analgesic than diclofenac alone. If these findings are explored to human beings, αT can be used an adjuvant to NSAIDs in the treatment of pain.

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Original Article

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Association of Serum Uric Acid Level with Progression to Preeclampsia among Pregnant Women

Begum T[1], Ali KMS[2], Khanam S[3], Lovely UT[4], Akter S[5], Jesmin S[6]

Abstract

Background: Serum uric acid level during early pregnancy is very crucial for the good outcome of pregnancy. **Objective:** The purpose of the present study was to see the association of serum uric acid level in predicting of preeclampsia among the pregnant women. **Methodology:** This cohort study was conducted in the OPD of the Department of Obstetrics and Gynaecology at Rajshahi Medical College Hospital, Rajshahi, Bangladesh from January 2013 to December 2014 for a period of two (2) years. This study was carried on pregnant woman attending in outdoor department of Gynaecology, Rajshahi Medical College Hospital, Rajshahi, Bangladesh before 20th weeks of pregnancy who were healthy normotensive primigravidae with singleton pregnancy. The serum uric acid was estimated before 20th weeks and after 28th weeks of pregnancy. **Result:** In this study 7(58.3%) women who developed preeclampsia had raised serum uric acid level in early trimester of pregnancy as compared to 13(20.6%) of those who did not develop preeclampsia. The risk of developing preeclampsia in pregnant women with raised serum uric acid in early trimester is 3.8 (95% Cl=1.3-10.7) times higher than those who did not have raised serum uric acid (p=0.019). **Conclusion:** In conclusion, estimations of serum uric acid early in pregnancy is of significant value in the prediction of subsequent development of PE. *[Journal of Monno Medical College 2018;4(1): 6-9]*

Keywords: Serum uric acid; preeclampsia; pregnant women; prediction

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Introduction

Preeclampsia is a form of hypertensive disorder of pregnancy[1]. Its general prevalence is between 2.0 to 8.0% of pregnancies[2]. It is a common cause of both maternal and perinatal morbidity and mortality in both developed and developing countries. Many biochemical markers of preeclampsia have been recognized in maternal serum. These include albumin, creatinine and uric acid among others. The results of some studies in normotensive pregnant women suggest that serum uric acid levels begin to rise before the appearance of hypertension and proteinuria[3].

In preeclampsia physiological changes in the spiral arteries are confined only to the decidua portion of the arteries. One of the important hypotheses for the pathogenesis of PE is that immunological disturbances cause abnormal placental implantation resulting in decrease placental perfusion which stimulates the production of substances in the blood that activates or injuries endothelial cells. The vascular endothelium provides single target organ system involved in PE. The relatively new theory of endothelial injury explains many of the clinical findings in preeclampsia[4]. Preeclampsia develops in a particular woman following an unfortunate combination of maternal (trophoblast-independent) risk factors and an excessive maternal response to the trophoblast/trophoblast derived factors[5].

Uric acid is a marker to oxidative stress, tissue injury and renal dysfunction[6]. Maternal serum uric acid concentration are increases more rapidly among preeclampsia group

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compared with normal pregnancy. So increase serum uric acid may be involved in the genesis of preeclampsia rather than indicate severity[7]. Most of the studies involving estimation of serum uric acid, albumin and creatinine levels for biochemical markers of the prediction of the subsequent development of PE, were performed late in the seconds and third trimester of pregnancy when the disease process was usually manifest[8].

Early identification of biochemical markers of the disease would not only facilitate selective recruiting of those at increased risk for PE but also help in determining those patients who were more likely to benefit from interventional measures should a therapeutic intervention prove successful[9]. This present study was undertaken to see the association of serum uric acid level in predicting of preeclampsia among the pregnant women.

Methodology

This descriptive cohort study was conducted in the OPD of the Department of Obstetrics and Gynaecology at Rajshahi Medical College Hospital, Rajshahi, Bangladesh. This study was carried out from January 2013 to December 2014 for a period of two (2) years. This study was carried on pregnant woman attending in outdoor department of Gynaecology, Rajshahi Medical College Hospital, Rajshahi, Bangladesh before 20 weeks of pregnancy who were healthy normotensive primigravidae with singleton pregnancy. Pregnant women who fulfill the following criteria was constituted as the study population for the research. Women with multiple pregnancies, chronic hypertension, diabetes mellitus, chronic renal disease were excluded from this study. Healthy normotensive primigravidae with singleton pregnancy were enrolled in this study before 20th weeks and were followed up after 28th weeks of pregnancy. The serum uric acid value in mg/dL was estimated before 20th weeks and after 28th weeks of pregnancy and were collected as variable in this study. PE was identified in women on the basis of one or more following parameters such as hypertension and degree of proteinuria. All the collection data were recorded in pre designed data sheet. Data were checked for validity were coded and entered into computer for analysis by using SPSS software programme. Result so obtained were evaluated and analyses statistically. Statistical significance were done at appropriate level ($p<0.05$) by applying relevant statistical tests. All the women enrolled in the study were explained about the nature and purpose of the study and only those who gave consent were included in this study. Also clearance from the Ethical Review Committee of Rajshahi Medical College, Rajshahi was taken to carry this study.

Results

At first 100 pregnant mothers were enrolled for the study. On the basis of inclusion and exclusion criteria 75 pregnant women finally included in this study. All were before 20th weeks of pregnancy without any complication or any risk factor for developing PE. Among them PE developed in 12 patients, the rest 63 patients not developed preeclampsia, remain normotensive. PE was identified in 12(16%) women out of 75 patients on the basis of one or more following parameters such as hypertension (SBP, DBP, MAP) and degree of proteinuria.

Table 1: Changes in clinical and biochemical parameters at follow up

Parameters	N	Mean	Std. Deviation	Cut-off value
Age(years)	75	21.02	2.05	
Serum creatinine (mg/dl)				≥0.97
1st visit	75	3.44	0.40	

Table 1 showed the anthropometric characteristics, blood pressure and other biochemical parameters. Mean serum uric acid in 1st visit 3.44±0.40 mg/dl respectively.

Table 2: Association between Serum Uric Acid and Preeclampsia (n=75)

Serum Uric acid	Preeclampsia		RR (95% Cl of RR)	$\chi 2$ *(P-value)
	Developed	Not developed		
Raised	7(58.3%)	13(20.6%)	3.8	5.525
Normal	5 (41.7%)	50 (79.4%)	(1.3-10.7)	(0.019)

Table 2 showed the association between serum uric acid and preeclampsia and had found that 7(58.3%) women who developed preeclampsia had raised serum uric acid level in early trimester of pregnancy as compared to 13(20.6%) of those who did not develop preeclampsia. The risk of developing preeclampsia in pregnant women with raised serum uric acid in early trimester is 3.8 (95% Cl=1.3-10.7) times higher than those who did not have raised serum uric acid (p=0.019).

Discussion

Serum uric acid and creatinine levels are a part of work up for the pregnant women with hypertension. The elevated levels of these parameters were due to decreased urinary clearance secondary to reduced GFR and increased reabsorption[3]. Serum uric acid is not only a marker of severity of disease but also contributes to the pathology of disorder[5].

Several studies have been carried out on the PE women to find out the causes of PE during pregnancy[4,6]. This problem is also significantly observed in Bangladesh. In this point of view this present study was carried out to evaluate the possibility of early predication of PE using estimation of serum albumin, creatinine and uric acid to reduce the maternal and perinatal morbidity and mortality. The study may be beneficial to Gynaecologists.

This study was designed to prospectively evaluate the possibility of early prediction of the subsequent development of PE using estimation of levels of some known biochemical substances affected by the disease in serum samples of healthy primigravidae with singleton pregnancy. The selection of primigravidae with singleton pregnancy was based on the knowledge that these groups of

women are more prone to developing the disease when all other risk factors are excluded. Those with conditions such as multiple gestation, chronic hypertension, diabetes mellitus and renal disease were carefully excluded from the study. Various studies have reported elevated levels of serum uric acid and creatinine in hypertensive disorders of pregnancy and also its effects on maternal and fetal outcomes[9-11]. Very few studies have given an optimum cutoff for the both in predicting hypertensive disorders of pregnancy[12-14].

Uric acid is a marker of oxidative stress, tissue injury and renal dysfunction; it is possible that uric acid merely identifies a more severe form of PE[12]. Uric acid is the end product of purine metabolism; it is synthesized by the enzyme xanthine oxidase, and in human most circulating uric acid is produced in the liver, During uncomplicated pregnancies serum uric acid concentration decreased by 25.0% to 35.0% in early pregnancy but then increase throughout pregnancy until toward the end of pregnancy when they approach non-pregnant values[10]. Increased scrum uric acid in women with PE has been consisting described for more than 80 years[11]. The explanation for the increase in serum uric acid has been primarily secondary to reduced renal urate clearance because of renal dysfunction[12]. A monitoring opinion suggests increased uric acid is a marker of increased xanthine oxidase activity[13].

In this study nearly three fifth (58.3%) of the women who developed preeclampsia had raised serum uric acid level in early trimester of pregnancy as compared to 20.6% of those who did not develop preeclampsia. The risk of developing preeclampsia in pregnant women with raised serum uric acid in early trimester is 3.8 times higher than those who did not have raised serum uric acid. Serum uric acid concentration are significantly increased as early as 10 weeks of gestation among women who go on to develop hyperurecaemia at delivery with PE. It is increased more rapidly among this group[14]. In a study patients who subsequently develop PE have significantly, higher levels of uric acid from 28 weeks of gestation[15].

The blood levels of uric acid and creatinine should not be elevated in normal pregnancy. There is considerable change in renal function in patients with PE[15]. The most obvious causes are alteration in renal hemodynamics due to vascular spasm and in advanced stages of the conditions, to haemoconcentration. A sudden decrease in creatinine clearance was of some value in predicting the subsequent development of PE in normal women's in those with fluid retention. Depression was occasionally observed 2 or 3 weeks before the clinical sign could be accepted[16].

There are some limitations of this study. The number of subject were not sufficient for this study. The duration for the study was not enough, otherwise a large sample could have been collected. Recruitment of patients into the study using the strict exclusion criteria affected the number eligible for the study because our patients in our country rarely book early in pregnancy unless they develop complications.

Conclusion

The findings of this study showed that estimations of serum uric acid concentrations early in pregnancy are of significant value in the prediction of subsequent development of PE. Large scale study is therefore recommended to properly define the value of estimation of serum uric acid levels in early pregnancy in the prediction of PE.

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Original Article

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Clinico-demographic Characteristics of Ilial Perforation Patients attended at a Tertiary Care Hospital in Dhaka City

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Yusuf MA[5], Sultana S[6]

Abstract

Background: Ileal perforation can occur in different demographic and clinical presentation. **Objective:** The purpose of the present study was to observe the clinical presentation and demographic characteristics among the ilial perforation patients. **Methodology:** This cross-sectional study was conducted in the Department of Surgery at Dhaka Medical College Hospital, Dhaka, Bangladesh from September 2000 to December 2002 for period of 2 years and 3 months. All the patients presented with ileal perforation at any age with both sexes were included in this study. Patients were selected consecutively and the patients who showed ileal perforation at laparotomy were included in this study. A standard protocol was filled up for every patient. Preoperative diagnosis was based on detailed history, complete physical examinations supported by plain x-ray abdomen in erect posture including both domes of diaphragm. After immediate resuscitation surgical treatment was undertaken as soon as possible following admission in all cases. **Result:** A total number of 100 patients were recruited for this study. Average age of male was 26.46 years and female was 31.35 years. Most of the patients who developed complications belonged to second decade. Out of 100 patients 74 cases were male and 26 cases were female. Majority were from poor socio-economic group. A large number of patients gave history of fever (77 patients) prior to their acute illness. Duration of fever was varied considerably from 5 days to maximum 32 days. Pain in abdomen was complained by all 100 patients. 58 patients complained of abdominal distension; 40 patients suffered from bout of vomiting, 17 patients had diarrhoea and 10 patients complained of constipation. On examination, all the patients had some degree of muscle guard and 58 patients had moderate to severe degree of abdominal distension; upper border of liver dullness was obliterated in 81 patients and absence of bowel sound was found in 80 patients. 27 patients were admitted in a state of shock either septicaemic or hypovolemic. **Conclusion:** In conclusion young adult male are mostly suffering from ileal preformation commonly presented with abdominal pain, abdominal distension and vomiting. *[Journal of Monno Medical College 2018;4(1): 10-13]*

Keywords: Clinico-demographic Characteristics; Ileal Perforation; clinical features

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Introduction

Ileal perforation is a very dangerous condition which leads to morbidity and mortality presented with different clinical presentation[1]. In Bangladesh, due to various socio-economic conditions, it is common for the patients to report very late to a hospital for their ailments. This delay may mask several or all of the classical features of the etiological factors in spontaneous ileal perforation[2]. In addition, misleading history may often lead to erroneous diagnosis of a perforated duodenal or gastric ulcer acute appendicitis, perforated appendicitis, or even intestinal obstruction[3].

In Bangladesh most of the ileal perforation is caused by

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typhoid enteritis[4]. A common presentation in these cases is a past history of continued type fever varying in severity for a week or two, with toxic faces and very frequently in septicaemic or hypovolemic shock[2]. The rigid abdomen with typical history should point towards such a diagnosis. Typhoid enteric perforation usually occurs in the second week; but it may vary from fourth day to as late as the 17th day of the febrile illness[5].

The patient may present with the past history of low grade fever of a long duration with evening rise, night sweating, gradual loss of weight and occasional colicy abdominal pain[4]. There may be associated intermittent diarrhoea. This typical picture of intestinal tuberculosis, when present in a patient reporting with features of acute abdomen, the possibility of intestinal perforation should be kept in mind. This study was undertaken to observe the clinical presentation and demographic characteristics among the ilial perforation patients.

Methodology

This cross-sectional study was conducted in the Department of Surgery at Dhaka Medical College Hospital, Dhaka, Bangladesh from September 2000 to December 2002 for period of 2 years and 3 months. All the patients presented with ileal perforation at any age with both sexes were included in this study. Patients were selected consecutively and the patients who showed ileal perforation at laparotomy were included in this study. A standard protocol was filled up for every patient. Preoperative diagnosis was based on detailed history, complete physical examinations supported by plain x-ray abdomen in erect posture including both domes of diaphragm. After immediate resuscitation surgical treatment was undertaken as soon as possible following admission in all cases. The socio-demographic characteristics and clinical features were recorded All patients received specific treatment for underlying diseases.

Results

A total number of 100 patients were recruited for this study. Age of the patient varied from 12 years to 70 years average being 27.73 years. Third decade comprises the largest age group. Average age of male was 26.46 years and female was 31.35 years. Most of the patients who developed complications belonged to second decade. Incidence of complications was noted more in patients older than 40 years i.e. admitted all patients above 40 years developed complications. Out of 100 patients 74 were male and 26 were female (Table 1).

The patients were grouped into three according to economic feasibility. Majority of three headings the patients were according to poor socio-economic group (Table 2).

Table 1: Age and Gender Distribution of Study Population (n=100)

Age Group	Male	Female	Total
11 to 20 Years	22	4	26(26.0%)
21 to 30 Years	35	9	44(44.0%)
31 to 40 Years	10	10	20(20.0%)
41 to 50 Years	4	1	5(5.0%)
51 to 60 Years	2	1	3(3.0%)
More Than 6 Years	1	1	2(2.0%)
Total	**74(74.0%)**	**26(26.0%)**	**100(100.0%)**
Mean±SD	26.5±11.34	31.4±10.23	

Table 2: Socio-Economic Status of Study Population (n=100)

SE Status	Frequency	Percent
Poor	88	88.0
Middle	10	10.0
High	2	2.0
Total	**100**	**100.0**

A large number of patients gave history of fever (77 patients) prior to their acute illness. Duration of fever was varied considerably from 5 days to maximum 32 days (Table 3).

Table 3: Duration of Illness in Total Patients (n=100)

Duration of Illness	Frequency	Percent
No Fever	23	23.0
Upto 7 Days	12	12.0
8 to 14 Days	36	36.0
15 to 21 Days	22	22.0
More than 22 Days	7	7.0
Total	**100**	**100.0**

The duration between the onset of acute abdominal symptoms and hospitalization was recorded. The duration ranged from 1 day to as long as 22 days (Table 4).

Table 4: Relationship between time lapses in hospitalization

Time Lapses	Frequency	Percent
Within 24 hrs	38	38.0
25 to 48 hrs	17	17.0
49 to 72 hrs	19	19.0
4 to 7 days	21	21.0
More than 7 days	5	5.0
Total	**100**	**100.0**

All patients were admitted with features of acute abdomen. So, pain in abdomen was complained by all 100 patients. 58 patients complained of abdominal distension; 40 patients suffered from bout of vomiting, 17 patients had diarrhoea and 10 patients complained of constipation. 9 patients gave history of blunt abdominal trauma (Table 5).

Table 5: Major Symptoms among Study Population

Major Symptoms	Frequency	Percent
Abdominal Pain	100	100.0
Abdominal Distension	58	58.0
Vomiting	40	40.0
Diarrhoea	17	17.0
Constipation	10	10.0

On examination, all the patients had some degree of muscle guard and 58 patients had moderate to severe degree of abdominal distension; upper border of liver dullness was obliterated in 81 patients and absence of bowel sound was found in 80 patients. 27 patients were admitted in a state of shock either septicaemic or hypovolemic. Dehydration was major sign in all 100 patients and severity varied from patient to patient. 77 patients complained of fever (Table 6).

Table 6: Major Signs among Study Population

Major Signs	Frequency	Percent
Fever	77	77.0
Dehydration	100	100.0
Feature of Shock	27	27.0
Abdominal Distension	58	58.0
Abdominal Tenderness	100	100.0
Abdominal Rigidity	100	100.0
Liver Dullness Obliterated	81	81.0
Absent Bowel Sound	80	80.0

Fever was absent among 23 cases. However majority were presented with 100^{o}F to 102^{o}F fever which was 41 cases. More than 102^{o}F was reported in 22 cases. Only 14 cases was presented with 99^{o}F to 100^{o}F of temperature (Table 7).

Table 7: Range of Fever among Study Population (n=100)

Range of Fever	Frequency	Percent
No Fever	23	23.0
99^{o}F to 100^{o}F	14	14.0
100^{o}F to 102^{o}F	41	41.0
More Than 102^{o}F	22	22.0
Total	**100**	**100.0**

Discussion

The clinical features of ileal perforation are due to the generalized peritonitis with paralytic ileus associated with features of the etiological factors6. In this study a total number of 100 patients were recruited for this study. Age of the patient varied from 12 years to 70 years average being 27.73 years. Third decade comprises the largest age group. Average age of male was 26.46 years and female was 31.35 years. Most of the patients who developed complications belonged to second decade. Incidence of complications was noted more in patients older than 40 years i.e. admitted all patients above 40 years developed complications. Out of 100 patients 74 were male and 26 were female.

The patients were grouped into three according to economic feasibility. Majority of three headings the patients were according to poor socio-economic group. A large number of patients gave history of fever (77 patients) prior to their acute illness. Duration of fever was varied considerably from 5 days to maximum 32 days. The duration between the onset of acute abdominal symptoms and hospitalization was recorded. The duration ranged from 1 day to as long as 22 days.

All patients were admitted with features of acute abdomen. Therefore, pain in abdomen was complained by all 100 patients. 58 patients complained of abdominal distension; 40 patients suffered from bout of vomiting, 17 patients had diarrhoea and 10 patients complained of constipation. 9 patients gave history of blunt abdominal trauma. On examination, all the patients had some degree of muscle guard and 58 patients had moderate to severe degree of abdominal distension; upper border of liver dullness was obliterated in 81 patients and absence of bowel sound was found in 80 patients. 27 patients were admitted in a state of shock either septicaemic or hypovolemic. Dehydration was major sign in all 100 patients and severity varied from patient to patient. 77 patients complained of fever. Similar result has been reported regarding this ileal perforation. Perforation of the small intestine usually starts with severe abdominal pain[2]. But in a patient ill for a prolonged period, the pain may not be so dramatic. Presence of fever varies with aetiology, but abdominal discomfort and vague abdominal pain may be present prior to the perforation[7]. The pain may be felt in the right ileal fossa, peri-umbilical region, or hypogastric region, but localization may be difficult. Spillage of intestinal content into the peritoneal cavity results in chemical irritation of the peritoneum due to its contents of varying enzyme[8]. The patient may be anxious and pale. Any movement may be utterly painful.

Fever was absent among 23 cases. However majority were presented with 100^{o}F to 102^{o}F fever which was 41 cases. More than 102^{o}F was reported in 22 cases. Only 14 cases was presented with 99^{o}F to 100^{o}F of temperature. Pulse is rapid, respiration is short and shallow and thoraco-abdominal in type. There is abdominal distension and absolute constipation. On examination, abdomen is tender and rigid. Rigidity may be maximum at the site of perforation. A per rectal examination may reveal tenderness[9].

Pulse rate rises further becoming thin and thready. This ominous phase of the peritonitis leads to hypovolemia, reduced circulatory volume, reduction in tissue perfusion, metabolic acidosis and renal impairment[10]. The patient may be very restlessness and sometimes delirious due to reduced cerebral circulation. Untreated, these patients with typical Hippocrate's facies, oblivious of the surrounding, slip into the terminal stage, and finally succumb to a combination of circulatory failure, septicaemia, endo-toxaemia and renal failure[11].

Much of the symptomatology is related to exudation of fluid and electrolyte into the peritoneal cavity coming from bowel lumen[7]. Penetration of bacteria and the production of endotoxin add to the insult.

Conclusion

In conclusion young adult are most commonly suffering from ileal perforation. Considering gender males are predominant than female. The majority of the ileal perforation patients are presented with the clinical features

of abdominal pain, abdominal distension and vomiting. Further large scale study should be carried out the get the country wide picture.

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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. *[Journal of Monno Medical College 2018;4(1): 14-17]*

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 gravity. If excessive forces are directed upon the lower leg from an outward direction such as a blow to the outside of

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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 bydiscriminant 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).

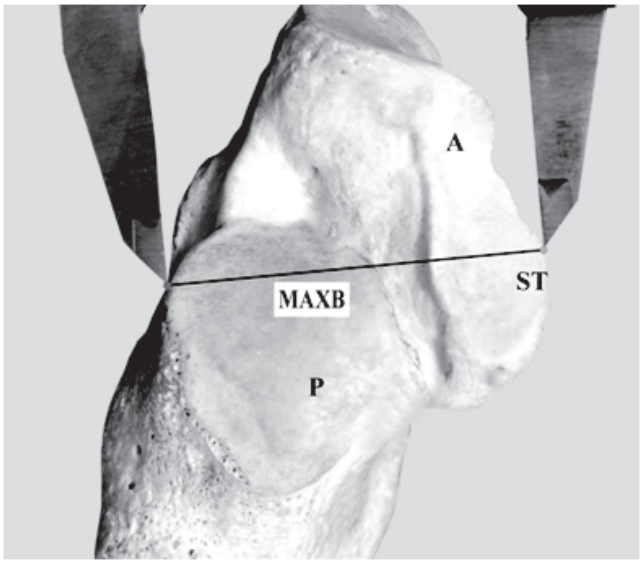

Figure I: Photograph showing maximum breadth measured by digital slide caliper. Red dot indicates the lateral most point on posterior articular facet and blue dot indicates the medial most point on sustentaculumtali. A represents anterior articular facet, P represents posterior articular facet and ST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

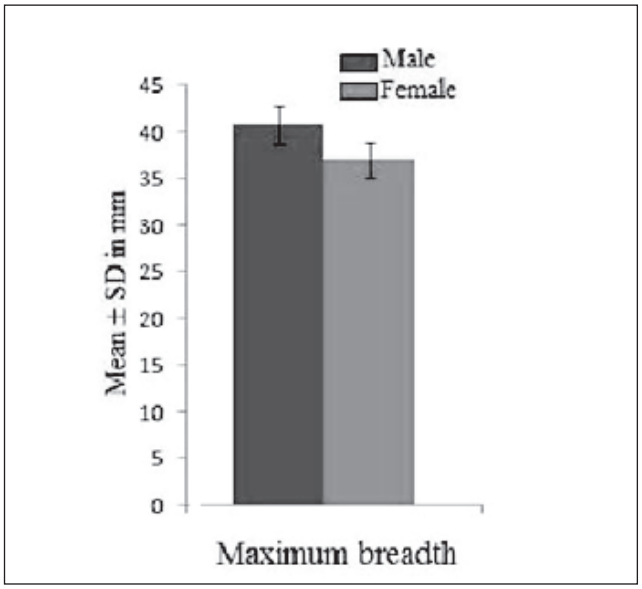

Figure II: Bar diagram showing minimum and maximum breadth of left calcaneus in male (n=80) and female (n=75)

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 breadthwas 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 breadthof 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 breadthwas 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 breadthwas 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 breadthwas 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 breadthof 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 maleand stated that maximum breadthof calcaneus was 44.61±2.61mm 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 Kim et 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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Review Article

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Digital Autopsy: A Medico Legal Review

Ahamed BU

Abstract
Digital Autopsy came into existence to overcome some problems during conventional autopsies without losing the objectivity of post-mortem examination. Imaging technology, such as Computerized Tomography (CT) or Magnetic Resonance Imaging (MRI) scans, is usually used to develop three-dimensional images for a virtual exploration of deceased body. The accuracy and acceptance of digital autopsy has improved over the last decays and is likely to be continued. Further research in this area is needed with institutional supports with reinforcement for theaccuracy and governance in this emerging field. *[Journal of Monno Medical College 2018;4(1): 18-20]*

Keywords: Digital Autopsy, Computerized Tomography (CT), Magnetic Resonance Imaging (MRI), post-mortem examination.

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Introduction

Digital autopsy is a non-invasive autopsy which is now a day's not that new concept but with potential field of exploration in future of forensic death investigation. In a forensic autopsy or Post-mortem examination, body of deceased is examined to acquire information on the cause of death inclusive but not limited to manner of death in people dying sudden, unexpected, violent, drug related, or otherwise suspicious deaths[1]. Digital Autopsy tries to answer the same investigative questions without actual dissection as in a conventional autopsy.

The main concept of Digital Autopsy came into existence to overcome some problems during conventional autopsies without losing the objectivity of post-mortem examination. Imaging technology, such as Computerized Tomography (CT) or Magnetic Resonance Imaging (MRI)scans, is usually used to develop three-dimensional images for a virtual exploration of deceased body. Here autopsy is conducted by digital tools. The steps of digitizing starts with the medical imaging modalities that provide the raw data images from the deceased andthe modalities are Computerized Tomography (CT scan) and Magnetic Resonance Imaging (MRI) scanner.

The term Digital autopsy emerges in the literature since 1985. However, there are many other similar terms like: Postmortem CT scanning for individual organs[2], volumetric radiologic scanning[3], Virtual Autopsy[4] and Virtopsy[5].The technical process which provides the digital environment for exploration of the 3D body is the three dimensional medical visualization in digital autopsy.

History

The department of Neuroradiology, University Hospital Mainz, Germany in the year 1980 the first documented Digital Autopsy studies was conducted where in 105 specimens of human stillborn and live-birth infants, ranging in age from gestational week 13 to postnatal month 18 were studied[6]. Since then the arena of 2D CT scan images has gradually evolved to present day technologies of Multi-planar reconstructions (MPR) and real to life high definition 3D rendering.

In visualization of the faces of some of the mummies, including that of chanters from the Temple of Karnak the digital 3D analysis of data obtained from CT scanning the mummies has encouraged the hope and progress in the field of digital autopsy. This technology has also given vast information about the embalming and burial processes[7]. In

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Switzerland Currently digital autopsy is being successfully used where it is called Virtopsy (virtual autopsy). Radiologists may call it Post-mortem Computed Tomography (PMCT) that does not provide colorful 3D views. Pathologists (Forensic pathologists) know this procedure as Digital Autopsy.

Discussion

Conceptual analysis: *The problems in conventional autopsy are:*

• Data acquisition in some body regions is difficult to somehow impossible, particularly in cases of decomposition.

• It is impossible to preserve the body after dissection and gather the findings with non-destructive and contamination-free procedures.

• Observer-independent documentation of the evidence is not available

• Data acquisition of the body with respect for the deceased, next of kin and religious obligations

• Slow and incomplete data acquisition in disasters

A technical solution for above mentioned problemswould be Digital Autopsy. In order to examine the deceased visually without any destructive, contaminating and non-preservative procedures like dissection medical imaging modalities like CT or MRI scanners can be employed in the first step. Moreover, using these images with software processing in visualization is the second step toward acquiring data from difficult regions from anatomical perspective and dignity of the body. In addition, quick evaluation of bodies and body parts in massive disasters is available in comparison to time-consuming procedure of conventional autopsy.

However, there are few limitations in Digital Autopsy. A very obvious difference is the real color of internal body organs and their changes in the deceased, in comparison to what is simulated in the visualization software. The main constraint is the data that is provided by medical imaging modalities are based on X-Ray and Magnetic fields (CT and MRI) that limit the view to what can be recorded by these technologies. Moreover, there are few articles about validity of Digital Autopsy in action.

Medico Legal acceptance

While Switzerland is pioneering in the acceptance[7], countries like Israel with strong religious background do not accept forensic imaging as a substitute or in conjunction with autopsy report. There are not many justice systems around the world who have accepted the Digital Autopsy as their legal procedures of forensic investigations. This might be due to lack of cases and documentation[8].

Some researchers tried to evaluate the reliability of Digital Autopsy in comparison with conventional (standard) autopsy that reveals totally 68.0% accuracy of Digital Autopsy regarding the path genetic mechanisms[9]. In UK, the Department of Health is currently considering recommendations for an integrated national cross-sectional autopsy imaging service, based on a regional service provided by mortuary-based imaging centres[10]. Furthermore, Royal College of Radiologists and the Royal College of Pathologists prepared a document to standardize medico-legal post-mortem cross-sectional imaging in adults in the UK[11].

Technology

The work output of the technical modalities is standard imagefiles (DICOM files). Each image may have a thicknessof 5mm, which means after whole body scan (human averageheight of 175 cm) it would produce 3500 images (slices) of human body. Using volume rendering thesetwo dimensional images are assembled to make a 3D projectionof human body. The 3D model is painted through RGBA transfer function to a colorful model. All visualizationand image processing features for manipulatingand navigating this 3D model make digital tools for conductinga Digital Autopsy. Computed tomography and MRI scanning are the most common imaging modalities employed for this Digital Autopsy. Furthermore, CT Angiography has been used to provide the imaging data for analyzing the deceased.These features enable pathologistto explore the entire body and examine interested regionsand organs from different angles. Image processingalgorithms help them to virtually remove layers of bodytissues like skin, muscle and bones. Moreover, low densityobjects like air and high density objects like metallicforeign bodies can be marked and viewed in the threedimensional body. For instance, organs with air (inside)like sinuses or intestines can be separated from other partsor any remnants of bullet in body due to gunshot injuries.

Process of Digital Autopsy

The best place for these facilities is in neighborhoods of mortuaries because of considerations about security, carriage and body condition. The process starts with registration of the case with all corresponding meta-data in a Digital Autopsy Facility. The body would be scanned according to the schedule with proper adjustments for deceased body. It means there is different configuration for emitting the ray in deceased in comparison to live bodies. This step may take 5 to 10 minutes depends on the abilities of scanner. The output is aforementioned DICOM files (around 3500 files for whole body scan) that would be sent for visualization process. The end result is a colorful 3D body that can be explored and examined for positive or negative findings with the digital tools. The process is not finished with 3D exploration. The findings would be reported digitally in a multimedia report. This report includes all textual results accompanied by images and recorded movie of Digital Autopsy during examination. This report is not only for common submission to the court but also to be displayed in the court for attendance.

Conclusion

The development of digital autopsies is exciting and important. There are some conditions still require a diagnosis from a traditional autopsy, but further research in the field might reduce the required number of traditional autopsies. The accuracy of cross-sectional imaging postmortem has improved over the last 20 years and is likely to continue to do so.Further research in this area needs institutional supports while reinforcing the need for thorough and robust governance in this emerging field.

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Case Report

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Scar Endometriosis Following Caesarean Section: A Rare Case Report

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Abstract

Scar endometriosis is a rare form of extra-pelvic endometriosis that can occur after surgery involving the uterus. Direct mechanical implantation seems to be the most conceivable theory for scar endometriosis. Patient usually presents with lump and pain at surgical site. Often the diagnosis of endometriosis is not suggested until histology has been performed. Scar endometriosis is a rare cause of painful scar; therefore, high index of suspicion is suggested in clinching the diagnosis. The recommended treatment is wide surgical excision with at least 1 cm margin on all sides. While performing lower segment caesarean section some preventive measures should be taken to prevent its occurrence. Histopathological examination is mandatory, as there is rare possibility of malignant transformation. Follow-up is advisable to diagnose recurrence. *[Journal of Monno Medical College 2018;4(1): 21-22]*

Keywords: Scar; Endometriosis; Caesarean Section

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Introduction

Endometriosis is a common gynecological condition defined as the presence offunctioning endometrial tissue outside the uterine cavity[1].Endometriosisoccurs in both diffuse and localized forms. A focal mass of endometrialtissue is known as an endometrioma. Although the diagnosis of endometriosis isrelatively common, the variable locations of endometrial implants may make it an uncommon differential diagnosis.

Ectopic implantation of endometrial tissueis often discovered in the pelvic cavity on the surface of the peritoneum, ovaries, pouch of Douglas, and uterosacral ligaments[2]. Affecting an estimated of 89 million women of reproductive age worldwide, endometriosis occurs in 5.0% to 10.0% of all women, often resulting in debilitating pain and infertility[2]. However, extra pelvic endometriosis is an uncommondisorder and difficult to diagnose. The various sites for extra pelvic endometriosis are bladder, kidney, bowel, omentum, lymph nodes, lungs, pleura, extremities, umbilicus, hernia sacs, and abdominalwall[3]. The most common extrapelvic location for endometriosis is the abdominal wall, typically presenting within scars following gynecological or obstetric surgery[1].

Diagnosis of this disease is not an easy process due to being often mistaken for a suture granuloma, incisional hernia, lipoma, abscess, cyst or a strange body. However, a mass in a cesarean section scar, with symptoms of cyclic pain related to menses, is nearly pathognomonic. The imaging techniques such as CT, MR or ultrasound assist in identifying the condition but definitive diagnosis is usually made with histologic examination[4,5]. This present study has described acase of scar endometriosis, and reviews the literature to elucidate physical signs and symptoms that maylead to earlier diagnosis and prompt treatment.

Case Presentation

Thirty years old female patient (Para 2 caesarian section, living 2) reported to ourgynecology out patient in July, 2018,with chief complaints of pain at the site of caesarean scar during menstruation associated with swelling at the same site since the last two years. The swelling increases during menstruation. She delivered her last child three years before by lower section caesarian section(LSCS). There was no history of endometriosis.For last two years, she noticed a swelling at the region of right side ofcaesarian scar, with dull aching constant pain at that site without any radiation. This pain used to get relievedfor sometime on taking some analgesics. She reportedto the institute three months back.

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General and systemic examination of the patient revealed no abnormalities. Local examination revealed a mass of 4X3 cm, at right extreme side of Pfannensteil caesarean scar with slight tenderness, firm consistency with restricted mobility. A probable diagnosis of scar endometriosis was made, and was planned for surgical excision. Allhematological investigations were within normal limits. Wide excision of the endometriotic tissuewas done. Stitches were removed on postoperative day 8. Stitch line had healed without any recurrence. Histopathological findings confirmed the diagnosis of scar endometriosis.It had showed endometrial tissue with haemorrhageand dilated endometrial gland.

Discussion

Endrometrioma is a well circumscribed mass of endometriosis. Abdominal wall endometriomapresents as a painful swelling resembling surgical lesions such as hernias, hematomas, granulomas, abscess and tumors. Therefore, that is why these cases generally first report to general surgeons. Scar endometriosis most commonly occurs after operation on the uterus and tubes. Incidence ofscar endometriosis following Hysterotomy is 1.1 to 2.0% whereas after cesarean section the incidence is 0.03 to 0.4%[6].

The reason for higher incidence after hysterectomy has been given as the early decidua has more pleuripotential capabilities and can result in cellular replication producing endometrioma. Time interval between operation and presentation has varied from 3 months to 10 years in different series. The etiology of abdominal wall endometrioma is thought to be a result of transportation of endometrial tissue during surgical procedures and subsequently stimulated by estrogen to produce endometrioma. The simultaneous occurrence of pelvic endometriosis with scar endometriosis is infrequent[6]. This patient also did not have associated pelvic endometriosis. Another study observed that 25.0% of the patients who develop incisional endometriosis have concomitant pelvic endometriosis[7].

Correct preoperative diagnosis is attained only in 20-50% of cases. Currently, ultrasound examination along with Doppler study with clinical data is recommended for preoperative diagnosis as it is widely available with lower cost[8]. Fine-needle aspiration cytology is one of the diagnostic methods as in the present case, but possibility of incisional hernia and reimplantation of potential malignant cells should also be taken into consideration, as well. Magnetic resonance imaging and computed tomography scan have almost similar sensitivity and specificity of 90.0 to 92.0% and 91.0 to 98.0%, respectively. These modalities can be used to know the extent and depth of lesion for presurgical mapping[9].

Medical management with oral contraceptive pills, as well as progesterone and gonadotropin-releasing hormone analogues provide symptomatic improvement, but recurrence is common after cessation of therapy. Recommended treatment is wide surgical excision with at least 1 cm margin on all sides and patch grafting of the facial defect, if required. Recurrence is always anticipated in all cases of endometriosis, which should be explained to patients before they undergo surgery. Patients should be followed-up for recurrence.

Malignancies in incisional endometriosis are rare, occurring in 0.31% of cases. The most common histological type is clear cell carcinoma[10]. Malignancy should be suspected in frequent recurrence or in fast-growing, large endometriosis[11].

With the increasing rate of LSCS, one can expect increase in the number of cases of scar endometriosis. Use of separate needles and mops for the uterine cavity and other tissues, closure of the visceral and parietal peritoneum, and thorough cleaning and irrigation of abdominal wall wound before closure are the recommended steps to prevent scar endometriosis[12].

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