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AIMS & SCOPE:

The Green Life Medical College Journal is an english language scientific papers dealing with clinical medicine, basic sciences, epidemiology, diagnostic, therapeutics, public helath and healthcare in relation to concerned specialities. It is an official journal of Green Life Medical College and is published bi-annually.

This Joural is recognized by Bangladesh Medical & Dental Council (BM&DC).

The Green Life Medical College Journal of Bangladesh intends to publish the highest quality material on all aspects of medical science. It includes articles related to original research findings, technical evaluations and reviews. In addition, it provides readers opinion regarding the articles published in the journal.

INSTRUCTION TO AUTHORS:

Papers:

The Green Life Medical College Journal (published bi-annually) accepts contributions from all branches of medical science which include original articles, review articles, case reports, and letter to the Editor.

The articles submitted are accepted on the condition that they must not have been published in whole or in part in any other journal and are subject to editorial revision. The editor preserves the right to make literary or other alterations which do not affect the substance of the contribution. It is a condition of acceptance that the copyright becomes vested in the journal and permission to republish must be obtained from the publisher. Authors must conform to the uniform requirements for manuscripts submitted to biomedical journals (JAMA 1997; 277: 927-34).

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In preparing the manuscript, use double spacing throughout, including title, abstract, text, acknowledgement, references, table and legends for illustrations and font type and size ‘Times New Roman 12’. Begin each of the following sections on a separate paper. Number pages consecutively.

The standard layout of a manuscript:

- Title page
- Abstract, including Keywords
- Introduction
- Methods
- Results
- Discussion
- Acknowledgements
- Funding
- List of references
- Tables & Figures
- Illustrations

The pages should be numbered in the bottom right-hand corner and the title page being page one, etc. Start each section on a separate page.

Title page:

A separate page which includes the title of the paper. Titles should be as short and concise as possible (containing not more than 50 characters). Titles should provide a reasonable indication of the contents of the paper. This is important as some search engines use the title for searches. Titles in the form of a question, such as 'Is drinking frequent coffee a cause of pancreatic carcinoma?" may be acceptable.

The title page should include the name(s) and address(es) of all author(s). Details of the authors' qualifications and post (e.g., professor, consultant) are also required. An author's present address, if it differs from that at which the work was carried out, or special instructions concerning the address for correspondence, should be given as a footnote on the title page and referenced at the appropriate place in the author list by superscript numbers ([1, 2, 3] etc.) If the address to which proofs should be sent is not that of the first author, clear instructions should be given in a covering note, not on the title page.

Abstract:
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Keywords:
Three to six keywords should be included on the summary page under the heading Keywords. They should appear in alphabetical order and must be written in United Kingdom English spelling.

Introduction:
The recommended structures for this section are:

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- What is known/unknown about it
- What research question / hypothesis you are interested in
- What objective(s) you are going to address

The introduction to a paper should not require more than about 300 words and have a maximum of 1.5 pages double-spaced. The introduction should give a concise account of the background of the problem and the object of the investigation. It should state what is known of the problem to be studied at the time the study was started. Previous work should be quoted here but only if it has direct bearing on the present problem. The final paragraph should clearly state the primary and, if applicable, secondary aims of the study.

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The title of this section should be 'Methods' - neither 'Materials and methods' nor Patients and methods'. The Methods section should give a clear but concise description of the process of the study. Subjects covered in this section should include:

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Ethical clearance:
Regardless of the country of origin, all clinical investigators describing human research must abide by the Ethical Principles for Medical Research Involving Human Subjects outlined in the Declaration of Helsinki, and adopted in October 2000 by the World Medical Association. This document can be found at: http://ohsr.od.nih.gov/guidelines/helsinki.html. Investigators are encouraged to read and follow the Declaration of Helsinki. Clinical studies that do not meet the Declaration of Helsinki criteria will be denied peer review. If any published research is subsequently found to be non-compliant to Declaration of Helsinki, it will be withdrawn or retracted. On the basis of the Declaration of Helsinki, the Green Life Medical Journal requires that all manuscripts reporting clinical research state in the first paragraph of the 'Methods' section that:

- The study was approved by the appropriate Ethical Authority or Committee.
- Written informed consent was obtained from all subjects, a legal surrogate, or the parents or legal guardians for minor subjects.

Human subjects should not be identifiable. Do not disclose patients' names, initials, hospital numbers, dates of birth or other protected healthcare information. If photographs of persons are to be used, either take permission from the person concerned or make the picture unidentifiable. Each figure should have a label pasted on its back indicating name of the author at the top of the figure. Keep copies of ethics approval and written informed consents. In unusual circumstances the editors may request blinded copies of these documents to address questions about ethics approval and study conduct.

The methods must be described in sufficient detail to allow the investigation to be interpreted, and repeated if necessary, by the reader. Previously documented standard methods need not be stated in detail, but appropriate reference to the original should be cited. However, any modification of previously published methods should be described and reference given. Where the programme of research is complex such as might occur in a neurological study in animals, it may be preferable to provide a table or figure to illustrate the plan of the experiment, thus avoiding a lengthy explanation. In longitudinal studies (case-control and cohort) exposure and outcome should be defined in measurable terms. Any variables, used in the study, which do not have universal definition should be operationalised (described in such terms so that it lends itself to uniform measurement). Where measurements are made, an indication of the error of the method in the hands of the author should be given. The name of the manufacturer of instruments used for measurement should be given with an appropriate catalogue number or instrument identification (e.g. Keyence VHX-6000 digital microscope). The manufacturer's town and country must be provided, in the case of solutions for laboratory use, the methods of preparation and precise concentration should be stated.

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Single case reports of outstanding interest or clinical relevance, short technical notes and brief investigative studies are welcomed. However, length must not exceed 1500 words including an unstructured abstract of less than 200 words. The number of figures/tables must not be more than 4 and references more than 25.

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In the case of animal studies, it is the responsibility of the author to satisfy the board that no unnecessary suffering has been inflicted on the animal concerned. Therefore, studies that involve the use of animals must clearly indicate that ethical approval was obtained and state the Home Office License number or local equivalent.

Drugs:
When a drug is first mentioned, it should be given by the international non-proprietary name, followed by the chemical formula in parentheses if the structure is not-well known, and, if relevant, by the proprietary name with an initial capital letter. Dose and duration of the drug should be mentioned in sufficient details. If the drug is already in use (licensed by appropriate licensing authority), generic name of the drugs should preferably be used followed by proprietary name in brackets.

Present the result in sequence in the text, table and figures. Do not repeat all the data in the tables and/or figures in the text. Summarize the salient points. Mention the statistics used for statistical analysis as footnote under the tables or figures. Figures should be professionally drawn. Illustration can be photographed (Black and White glossy prints) and numbered.

Discussion and Conclusion:
Comments on the observation of the study and the conclusion derived from it. Do not repeat the data in detail, already given in the results. Give implications of the findings, their strengths and limitations in comparison to other relevant studies. Avoid un-qualified statements and conclusions which are not supported by the data. Avoid claiming priority. New hypothesis or implications of the study may be labeled as recommendations.

Letters are welcome. They should be typed double-spaced on side of the paper in duplicate.

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References should be written in Vancouver style, numbered with arabic numerals in the order they appear in the text. The reference list should include all information, except for references with more than six authors, in which case give the first six names followed by et al.

Examples of correct forms of references:
Dorababu M, Prabha T, Priyambada S, Agrawal VK, Aryaa NC, Goel RK. Effect of Azadirachta indica on gastric ulceration and healing of bacopa monnierang in experimental NIDDM rats. *Indian J Exp. Biol 2004; 42: 389-397.*

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Any reader can provide feedback regarding published articles by writing letter to editor. The reader can also share any opinion in relation to medical science.

Professor M.A. Azhar
Editor-in-chief
Green Life Medical College Journal and
Principal
Green Life Medical College

ABOUT THE COLLEGE

INTRODUCTION

In 2005, about fifty distinguished physicians of the country started a hospital to give specialized care in the private sector. They named it Green Life Hospital and it turned out to be a great success. So in 2009, they decided to establish a medical college which will be a non-government, non-profit, self-financing project and will serve the humanity.

This College came into existence in 2009. The college commences its activities with the enrollment of 51 students in the 1st batch in 2010. Since inception, the college has undergone tremendous development and became a splendid centre for learning and development. At present we are enrolling 110 students each year. Among them, numbers of seats are reserved for overseas students.

We continue to evaluate and improve our programme to ensure the best medical education for the students. Our educational strategy is to create a conducive learning environment and to steer our students to acquire adequate knowledge, skills and temperament to practice medicine and be a competent health care professional group.

Green Life Medical College (GMC) is approved by the Ministry of Health and Family Welfare (MOHFW), Government of Bangladesh and Bangladesh Medical and Dental Council (BMDC) and affiliated to the University of Dhaka.

AIMS AND OBJECTIVES OF THE COLLEGE

Aims:

To create a diverse and vibrant graduate scholars in medical discipline and to create highly competent and committed physicians for the country.

Objectives:

- To provide an appropriate learning environment where medical students can acquire a sound theoretical knowledge and practical skills with empathetic attitude to the people.
- To carry out research in medical sciences to scale up the standard of medical education in the country.

LOCATION

The campus is located at 31 and 32, Bir Uttom K. M. Shafiullah Sarak (Green Road), Dhanmondi, Dhaka. The location is at the heart of the mega city Dhaka and is facilitated with very good communication networks.

The Medical College and the Hospital complexes have been raised in a multistoried fully air-conditioned building with an arrangement of approximately 500 patients. The building is equipped with state-of-the-art infrastructure, excellent with an out-patient department and adequate in-patient facilities.

EDITORIAL

Disposing Dead Bodies during COVID-19 Pandemic: Points to be Remembered

The emergence of SARS-CoV-2, a novel human coronavirus, causing severe respiratory tract infections in humans, has become pandemic and raises a global health concern. Since the virus was first identified in December 2019, the numbers of deaths have been propagating exponentially, causing countries across the world, including Bangladesh, to increase emergency measures to combat the virus. Due to the fact that the COVID-19 pandemic does not discriminate its victims, it is of paramount importance to construct a plan for management of the dead for all suspected or confirmed COVID-19 cases, including the unidentified deceased. Therefore it is essential to have measures in place to contain the spread of infection while handling dead bodies. Different guidelines and protocols have been proposed based on the fact that the limited information we have acquired about this novel virus.

The Directorate of health services, Bangladesh has improvised procedures and guidelines for management of the dead within the existing regulations in order to achieve a balance between medicolegal requirements and the safety of personnel managing the bodies of the deceased with suspected or confirmed COVID-19 infection; at the site of death, during transport, during postmortem procedures, storage and preparation before and during burial or cremation as well as environmental cleaning and disinfection, involving various agencies in the country. Whenever possible, every opportunity and assistance must be given to families to mourn their loved ones, even in times of crisis or an outbreak, in order to ensure an appropriate level of dignity and respect.

COVID-19 is transmitted via droplets and fomites during close unprotected contact between an infector and infected. Airborne spread has not been reported for COVID-19 yet, however, it can be predicted if certain aerosol-generating procedures are conducted in health care facilities, including mortuaries during autopsies. Though still there is no evidence of being infected while handling dead body, the infection may be transmitted when persons are in contact with blood, body fluids or tissues of the corpses. Only lungs of dead COVID patients, if handled improperly during autopsy, can be infectious.

The Principles of handing the dead bodies should be comprised of:

- Ensuring safety and wellbeing of those involved in managing and handling the dead from COVID-19.
- Ensuring the proper and dignified management of all COVID-19 fatalities with respect for their families and communities.
- Ensuring the reliable documentation, identification and traceability of COVID-19 fatalities to prevent them from being missing persons.
- Ensuring the management of COVID-19 fatalities does not impede medico legal investigation where required by the authorities(e.g. suspicious deaths, deaths in custody)

Standard Precautions for Health Care Worker while handling dead bodies like hand hygiene, use of personal protective equipment (e.g. water resistant apron, gloves, masks, eyewear), safe handling of sharp instruments, disinfecting bag housing dead body; instruments and devices used on patient, disinfecting linen etc. Clean and disinfect environmental surfaces etc. should be practiced rigorously. All the staffs assigned to handle dead bodies in isolation area, mortuary, ambulance and those who works in burial ground/ crematorium should be trained in infection prevention control practices. Mortuary staff handling COVID dead body should observe standard precautions. The dead bodies should be stored in cold chambers maintained at approximately 4°C. Mortuary must be kept clean. Environmental surfaces, instruments and transport trolleys should be properly disinfected with 1% Hypochlorite solution.

During removal of body from isolation room or area, followings need to be ensured:

- Health worker attending dead body should perform hand hygiene; ensure proper use of PPE (water resistant apron, goggles, N95 mask, gloves).
- All tubes, drains and catheters on dead body should be removed.

- Any puncture holes or wounds (resulting from removal of catheter, drains, tubes, or otherwise) should be disinfected with 1% hypochlorite and dressed with impermeable material.
- Apply caution while handling sharps such as intravenous catheters and other sharp devices. They should be disposed into a sharps container.
- Plug oral, nasal orifices of dead body to prevent leakage of body fluids.
- If family of patient wishes to view body at time of removal from isolation room or area, they may be allowed to do so with application of standard precautions.
- Place dead body in leak-proof plastic body bag. Exterior of body bag can be decontaminated with 1% hypochlorite. Body bag can be wrapped with mortuary sheet or sheet provided by the family members.
- Body will be either handed over to relatives or taken to mortuary.
- All used/ soiled linen should be handled with standard precautions, put in bio-hazard bag and outer surface of bag disinfected with hypochlorite solution.
- Used equipment should be autoclaved or decontaminated with disinfectant solutions in accordance with established infection prevention control practices.
- All medical waste must be handled and disposed of in accordance with Bio-medical waste management rules.
- Health staff who handled body will remove personal protective equipment and will perform hand hygiene
- Provide counseling to family members and respect their sentiments.

During transportation, the bodies are to be secured in body bag, exterior of which is decontaminated poses no additional risk to staff transporting dead body. Personnel handling body may follow standard precautions (surgical mask, gloves). The vehicle used for transfer the bodies need to be decontaminated with 1% Sodium Hypochlorite.

The burial Ground/ crematorium staff should be sensitized that COVID-19 does not pose additional risk. But the staffs should practice standard precautions of hand hygiene, use of masks and gloves. Viewing of dead body by unzipping face end of body bag (by the staff using standard precautions) may be allowed, for relatives to see body for one last time. Religious rituals such as reading from religious scripts, sprinkling holy water and any other last rites that does not require touching of body can be allowed. Bathing, hugging etc. of dead body should not be allowed. Funeral/ burial staff and family members should perform hand hygiene after burial/ cremation. Ash does not pose any risk and can be collected to perform last rites. Large gathering at burial ground/crematorium should be avoided as a social distancing measure as it is possible that close family contacts may be asymptomatic and/or shedding virus. After removing body, chamber door, handles and floor should be cleaned with sodium hypochlorite 1% solution. And embalming of dead body should not be encouraged.

Forensic disciplines contributes equally in the combat of COVID-19, integrating law and medicine and working closely with police, funeral directors and other related authorities in managing the dead. Issues with storage and decomposition, shortages of staff and appropriately equipped mortuaries and other crippled resources, can cause bodies to accumulate if they are not managed in a timely manner. Improvised procedures and guidelines for the management of large numbers of decedents have to be put in place to handle the increased volume of bodies. There is a need to integrate sufficient legal complexities into the social context as well as the consideration of the safety of personnel managing the dead during this unprecedented time. It is imperative to plan and take every necessary step during this pandemic for the management of the dead in the country as a basic human right

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References

1. Amodio E, Vitale F, Cimino L, Casuccio A, Tramuto F. Outbreak of novel coronavirus (SARS-Cov-2): first evidences from international scientific literature and pending questions. Healthcare. 2020;8(51):1–8. [PMC free article] [PubMed] [Google Scholar]
2. European Centre for Disease Prevention and Control. Considerations related to the safe handling of bodies of deceased persons with suspected or confirmed COVID-19. 2020. https://www.ecdc.europa.eu/en/publications-data/considerations-related-safe-handling-bodies-deceased-persons-suspected-or.
3. Hanley B, Lucas SB, Youd E, Swift B, Osborn M. Autopsy in suspected COVID-19 cases. J Clin Pathol 2020;0:1–4. [PubMed]

4. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. J Hosp Infect. 2012;104:246–251. doi: 10.1016/j.jhin.2020.01.022. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

5. Finegan O, Fonseca S, Guyomarc'h P, Morcillo Mendez MD, Rodriguez Gonzalez J, Tidball-Binz M, et al. International Committee of the Red Cross (ICRC): general guidance for the management of the dead related to COVID-

19. Forensic Sci Int. 2020;2:129–137. [PMC free article] [PubMed] [Google Scholar]

6. World Health Organization. Situation Report-77: Coronavirus disease 2019 (COVID-19). 2020. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports.

7. World Health Organization. Interim guidance: Infection Prevention and Control for the safe management of a dead in the context of COVID-19. 2020. https://apps.who.int/iris/handle/10665/331538.

8. World Health Organization. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). 2020. https://www.who.int/news-room/feature-stories/detail/who-china-joint-mission-on-coronavirus-disease-2019-(covid-19).

9. National Crisis Preparedness and Response Centre, Ministry of Health health andfamily welfare.

10. Nolte KB, Taylor DG, Richmond JY. Biosafety considerations for autopsy. Am J Forensic Med Pathol. 2002;23:107–122. doi: 10.1097/00000433-200206000-00001. [PubMed] [CrossRef] [12. Act 342. Prevention and Control of Infectious Diseases Act 1988. Laws of Malaysia 2016.

11. Management of dead bodies after disaster: A field manual for first responders. 2nd ed. Washington D.C.: International Committee of the Red Cross; 2016.

12. Noor MSM, Khoo LS, Alias WZZ, Hasmi AH, Ibrahim MA, Mahmood MS. The clandestine multiple graves in Malaysia: the first mass identification operation of human skeletal remains. Forensic Sci Int. 2017;278:410 e1–410 e9. doi: 10.1016/j.forsciint.2017.05.014. [PubMed] [CrossRef] [Google Scholar]

ORIGINAL ARTICLE

Access to Health Care Services of Rural Women in Dhamrai Upazilla of Bangladesh

KHAN S[1], KHAN S Z[2], CHOUDHURY S[3], AZIM E[4]

Abstract

Introduction: Women constitute about 49.5% of the world's population. Besides, women are special in a way that their biology is different than that of the men and it has been seen that prevalence of women specific disease is getting high. Access to health care services is critical to good health yet rural residents face a variety of access barrier. Rural women health care services in Bangladesh are inadequate to say the least. The objective of this study was to find out the accessibility and obstacles to receive health care services of women in rural areas in Dhamrai Upazilla of Bangladesh.

Methods: A descriptive type of cross sectional study was done among 325 rural women aged 18 years and above in Dhamrai Upazilla of Bangladesh from January 2019 to March 2019, by face to face interviewing the rural women using pretested semi-structured questionnaire. The collected data were analyzed manually and by using MS Excel.

Results: According to this study, majority (35.4%) of the respondents were within age group of 18-27 years, 63.1% were Muslims and 67.7% of the respondents were married. About 36.9% of the respondents were educated up to primary level whereas 18.5% of them could sign only. Highest proportions of the respondents (83.4%) were home maker. More than half (56.6%) of the respondents lived in joint family and most (67.3%) of the respondents' monthly family income was within Tk.10,000 –Tk.20,000. Majority (96.6%) of the respondents felt the need of health care services. However, 41% could always afford to access the health care service and 32.2% of the respondents mentioned the most available health care facility was Community Clinic. Only 14.8% of the respondents received the required health care services very easily and about 12.2% women told not to attend health care centres due to lack of permission from family. It was found that 64.6% of the respondents received adequate information about the health care services and majority (29.6%) were informed this from their relatives and neighbors. More than three fourth of the respondent (79%) got treatment from the adjacent places and 16.3% of the respondent who did not attend the health care centers for illness and highest proportion (39%) gave the reasons as lack of financial support (39%). But About 36.9% of the respondents faced delay in making an appointment with a doctor and most of the respondents (87.7%) did not experience gender discrimination while receiving health care by health care providers.

Conclusion: To create awareness in terms of access of health care services it is recommended to encourage female literacy, provide employment opportunities for rural female and abolish cultural norms that stigmatize women related health problems.

Key words: Health care service, Accessibility of health care, Health of rural women

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Introduction:

Women's health is an example of population health. Because the health of the women determines the health of future generation. But the prevalence of women specific diseases is high. Many social, cultural and geographical factors as well as education level and poverty have been reported to play roles in the poor utilization of health services.[1,2,3] Access to healthcare has been highlighted as the major barrier towards the utilization of maternal health services in low-income countries, especially in sub-Saharan Africa (SSA).[4,5,6] Access to healthcare can be broadly defined based on availability, affordability, accessibility and acceptability[7] but is simply referred to as the timely use of health services to achieve the desired health outcomes. Each ward now has at least one dispensary and/ or health center, each district has at least one hospital, while each division has at least one referral hospital. Despite agreement that access to healthcare must be universal and guaranteed for all on an equitable basis[8] women continue to face significant inequities in accessing and using healthcare particularly in low-income countries.[9] In relation to the problems experienced by women in accessing healthcare, the following four major problems have been addressed in previous studies: obtaining permission,[10,11] obtaining money,[12] distance to the health facility[13] and not wanting to go alone (lack of spouse or family member escort).[14, 15]

The problem of access to health care is particularly acute in Bangladesh. One crucial determinant of health seeking among rural women is the accessibility of medical care and barriers to care that may develop because of location, financial requirements, bureaucratic responses to the patient, social distance between client and provider, and the sex of providers.[16]

The main aim of this study was to find out accessibility and barriers that become hindrance to women's access to health care services which may provide data for planning, implementation and evaluation of health care programs that would enable them to lead a productive life and ultimately contribute in the development of the country.

Methods:

This was a cross-sectional study, which was a descriptive type of observational study. Study was conducted from January 2019 to March 2019. The study was carried out in the villages of Dhamrai Upazilla namely Barigaon, Keliya and Shuapur. Population was the women of 18 years and above in rural areas of Dhamrai Upazilla, Dhaka. Sample size was 325 women and sample technique was non-probability purposive type of sampling. Data were collected by face to face interviewing of women of 18 years and above using semi-structured questionnaire which was developed, pretested and finalized before data collection. Data were collected on socio-demographic details of the respondents and on health care service related information, availability and affordability of health care services and accessibility of health care services. After collection of data each questionnaire was checked for inconsistency. Then the data were analyzed manually and some portions by using computer based software- MS Excel.

Results:

About 35.4% women's' age was between 18 to 27 years, 67.7% were married , 23.4% were unmarried, 7.1% were widowed, 36.9% women had primary level education and 83.4% mothers were homemakers, about half (56.6%) of the respondents were from joint family and 67.3% women's monthly family income was 10001- 20000 taka. (Table- I)

Table- I

Distribution of respondents by socio-demographic characteristics

Socio-demographic characteristics	Frequency (n)	Percentage (%)
A. Age of respondents in year		
18- 27	115	35.4
28- 37	95	29.2
38- 47	55	16.9
48- 57	29	8.9
58-67	31	9.6
B. Marital status of respondents		
Unmarried	76	23.4
Married	220	67.7
Divorced	06	1.8
Widow	23	7.1
C. Educational status of respondents		
Primary level	120	36.9
No formal education	75	23.1
Can sign only	60	18.5
Up to SSC level	39	12.0
Up to HSC or above	31	9.5
D. Employment status of respondents		
Home maker	271	83.4
Student	13	4.00
Service holder	12	3.7
Business	25	7.7
Teacher	04	1.2
E. Type of family of respondents		
Joint family	184	56.6
Nuclear family	141	43.4
F. Monthly family income in taka		
10001- 20000	219	67.3
20001- 30000	52	16
0- 10000	29	8.9
>40000	25	7.8

About 96.6% women had opinion about necessity of the health care service, 82.5% had affordability of health care needs where about 91.1% women had knowledge of when to attend healthcare service facilities and 64.6% women had adequate available health care service information. (Table- II).

Table- II

Distribution of respondents according to health care service related information

Variables	Frequency (n)	Percentage (%)
A. Opinion about necessity of the health care service		
Yes	314	96.6
No	11	3.4
B. Bearing affordability of health care needs		
Yes	268	82.5
No	57	17.5
C. Knowledge about when to attend healthcare service facilities		
Yes	296	91.1
No	29	8.9
D. Adequacy of available health care service information		
Yes	210	64.6
No	73	22.5
Unsure	42	12.9

Highest proportion (29.6%) of the women got information about available health care services from relative. About 14.4%, 12.6%, 7.9% and 5.8% women got information about available health care services from school, hospital, health assistant and local pharmacy respectively. (Figure- 1)

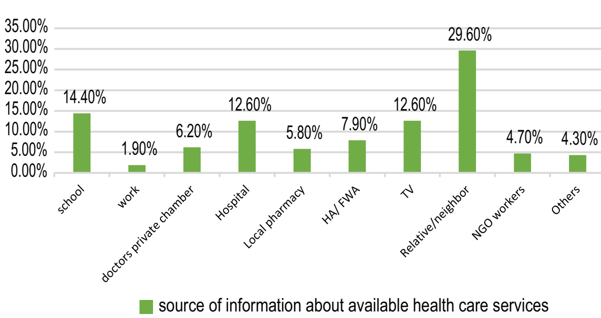

Figure-1: *Distribution of women according to source of information about available health care services*

About 52.3% women received needed health care service easily where 32.9% found it difficult. Here 6.1% never had financial affordability to access health care service. Highest proportion of the respondents (35.8%) told that health care facility available at community clinic for them. More than half (60.3%) had experience of financial difficulties for spending on health care sometimes, 64.5% women postponed health care visit because of cost. (Table-III).

Table- III

Distribution of respondents according to availability and affordability of health care service

Variables	Frequency (n)	Percentage (%)
A. Receiving the necessary health care services within 12 months		
Easy	170	52.3
Difficult	107	32.9
Very easy	48	14.8
B. Financial affordability to access health care services		
Sometimes	172	52.9
Always	133	41
Never	20	6.1
C. Places where health care facility are available for the respondent		
Community clinic	116	35.8
Upazilla health complex	104	32
Hospital	105	32.3
D. Experience of financial difficulties for spending on health care		
Sometimes	196	60.3
Never	129	39.6
E. Postpone health care visits because of cost(n=322)*missing data present		
Never	209	64.5
More than two times	116	35.5

Highest proportion (51.1%) of the women suffered from fever, 16.3% and 9.2% were suffered from hypertension and gynecological problems respectively. During illness 83.7% women attended at health care centre, 35.5% faced delay in availing necessary medicines, 36.9% faced delay in accessing appointment with doctor and 21.9% faced delay in accessing treatment intervention.(Table- IV)

Table- IV

Distribution of respondents according to accessibility of health care service

Variables	Frequency (n)	Percentage (%)
A. Types of illness suffered in last 12 months (n=392) *Multiple responses		
Fever	166	51.1
No morbidity	143	44
Hypertension	53	16.3
Gynecological	30	9.2
B. Attending health care centre during morbidity (n=270)* Missing data		
Yes	272	83.7
No	53	16.3
C. Delay in availing the necessary medicines		
Yes	115	35.5
No	210	64.5
D. Delay in accessing appointment with a doctor		
Yes	120	36.9
No	205	63.1
E. Delay in accessing a treatment intervention		
Yes	71	21.9
No	254	78.1

Highest proportion (39%) of the women did not attend health care center due to lack of financial support, 12.2 % due to not getting permission from family, 8.1% due to transportation problem and about 6.1% due to distant from home. (Figure- 2)

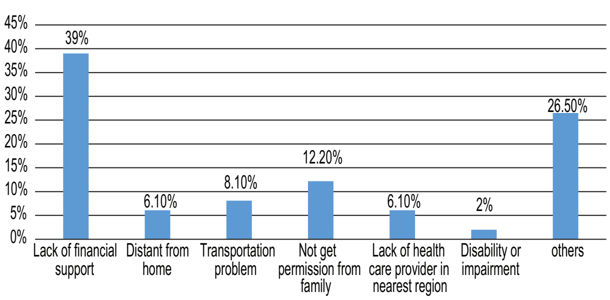

Figure-2: *Distribution of women according to reason for not attending health care centres*

About 18% of the women's care seeking place was another city and 3% was another region. (Figure- 3)

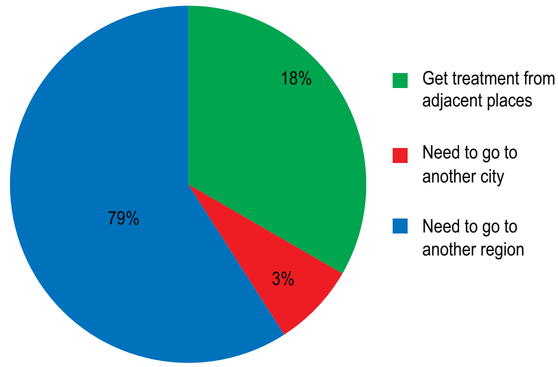

Figure-3: *Distribution of women by their care seeking places*

Discussion:

In this study the major proportion of the respondents were within the age group of 18 –27 years (35.4%). Most of them (63.1%) were Muslim and 36.4% were Hindu. The marital status of the respondents showed that 23.4% were unmarried, 67.7% were married, 1.8% were divorcee and 7.1% were widowed. About 83.4% were home maker and only 3.7% were service holder. In comparison to the study 'Brutal neglect: Australian rural women's access to health services', majority of the respondents that is 33% were within the age group of 45 – 54 years. Most of them (80%) were married and 4% were divorced, 5% were widowed, 3% separated and 8% were single. About 79% of the respondents were earning.[17] Among the respondents who believed that the information is adequate 14.4% got the information from school, 1.9% from work, 6.2% from doctor's private chamber, 12.6% from the hospital, 5.8% from the local pharmacies, 7.9% from health assistant or family welfare assistant, 12.2% from television, 29.6% from relatives or neighbors, 4.7% from NGO workers and 4.3% from others. As compared to the study conducted in America, 85% had TV, 54% had relatives and neighbors, 51% had newspaper while only 38% had health professionals as their source of health related information.[18] According to the Health Bulletin 2016, about 63.2% did not have enough information about health care services and did not know where to go.[19] Present study illustrates that accessibility to the needed health care services within past 12 months was easy for 52.3%, very easy for 14.8% and difficult for 32.9%. Also, 41% can always afford to access the health care services, 52.9% can sometimes afford and 6.1% can never afford to access the health care services. Financial difficulties as a result of spending on health care was experienced by 60.3% sometimes and 39.6% never experienced any problems.

According to the respondents, majority (35.8%) of the respondents sought the health care facility from Community clinics, 32% from UHC, 32.3% from Hospital. On the other hand, in the study "The Disease Pattern and Utilization of Health Care Services in Pakistan", majority (57%) of the respondents sought health care services from private doctors/clinics, 26% from government hospitals and 13.7% from hakeem/ homeopaths. Only a very small proportion (3.3%) of the respondents has reported visiting community health workers/lady health visitors and faith healers.[20]

As per our study, over the last 12 months, 44% had no morbidity, 51.1% had fever, 16.3% had Hypertension, 9.2% had Gynecological Problem. In contrast to the survey in the article 'Disease pattern and Health Seeking Behavior in Rural Bangladesh', 33.2% suffered from fever, 24.9% from gastrointestinal diseases and 17.8% from respiratory diseases.[21] Of the respondents, 83.7% attended health care center for their illness while 16.3% did not receive any health care services because of various reasons like lack of financial support (39%), not getting permission from family (12.2%), transportation problem (8.1%), distant from home (6.1%) and lack of health care providers in nearest health centers (6.1%). In contrast, a survey conducted by BDHS described that 80% of rural women live in hard to reach areas of our country with no nearby health facilitates, 54% mentioned a lack of confidence in the health care services, 71.4% faced financial constraints, 44% inability to get family permission; 49.2% difficulty to get someone to accompany them due to security and cultural norms.[19] When asked about any delay in health related services, 36.9% had delay in making an appointment with a primary care doctor , 21.9% had delay in accessing a treatment intervention and only 35.5% had delay in taking required medicine, which is quite high as compared to the scenario of America reported in 'Health disparities in rural women' published by The American College of Obstetricians and Gynecologists.[20] Seventy nine percent of the respondents preferred to receive treatment from the adjacent places. Only 21% had to travel far to get themselves treated, which if compared to the report 'Health disparities in rural women' is less which is about 10%. [22]

Conclusion:

To find out the access and obstacles to receive health care services of women of Dhamrai Upazilla, Bangladesh, this cross-sectional study was carried out. The study found that majority of the respondents were within the age group of 18-27 years, married, Muslim, housewives and were educated up to primary level. Of the women, who did not attend the health care services, cited various reasons responsible for it. These include lack of financial support, not getting permission from family, transportation problem, distant from home and some of them even mentioned their disability as a reason. About nine out of ten women knew when to attend the health care services and most of the respondents believed the information is adequate. According to the study, almost all the respondents had health care services available to them. The main hindrance in accessing the health care services as cited by the respondents was financial problem with significant number of people reducing the expenditure on primary essential needs.

Access of health care services to rural women can be improved by increasing income generating activities of the family, improving services of community clinic, overcoming all social and family obstacle and finally arranging of health education programs periodically for the rural family.

References:

1. Babalola SO. Factors associated with use of maternal health services in Haiti: a multilevel analysis. Rev Panam Salud Publica 2014; 36:1–9.
2. Ngomane S, Mulaudzi FM. Indigenous beliefs and practices that influence the delayed attendance of antenatal clinics by women in the Bohlabelo district in Limpopo, South Africa. Midwifery 2012; 28:30–8.
3. Ali HS, Abdalla A, Abdalla A. Understand Factors Influencing Accessibility of Pregnant Women to Antenatal Care Services Accessibility factors: Demographic characteristics of the study. Heal Sci J 2016; 10:1–5.
4. Odetola TD. Health care utilization among rural women of childbearing age: a Nigerian experience. Pan Afr Med J 2015; 20: 1–7.
5. Victora CG, Barros AJ, Axelson H, et al. How changes in coverage affect equity in maternal and child health interventions in 35 Countdown to 2015 countries: an analysis of national surveys. Lancet 2012; 380: 1149–56.
6. Singh PK, Kumar C, Rai RK, et al. Factors associated with maternal healthcare services utilization in nine high focus states in India: a multilevel analysis based on 14 385 communities in 292 districts. Health Policy Plan 2014; 29: 542–59.
7. O' Donnell O. Access to health care in developing countries: breaking down demand side barriers. Cad Saude Publica 2007; 23: 2820–34.
8. Kirby N. Access to healthcare services as a human right. Med Law 2010; 29:487–96.
9. Ganle JK, Parker M, Fitzpatrick R, et al. Inequities in accessibility to and utilisation of maternal health services in Ghana after user-fee exemption: a descriptive study. Int J Equity Health 2014; 13:89.

10. Danforth EJ, Kruk ME, Rockers PC, et al. Household decisionmaking about delivery in health facilities: evidence from Tanzania. J Health Popul Nutr 2009; 27:696–703.

11. Wilunda C, Scanagatta C, Putoto G, et al. Barriers to utilisation of antenatal care services in South Sudan: a qualitative study in Rumbek North County. Reprod Health 2017; 14:65.

12. Lowe M, Chen DR, Huang SL. Social and cultural factors affecting maternal health in rural Gambia: an exploratory qualitative study. PLoS One 2016; 11: e0163653.

13. Mbiza CR, Kazembe A, Simwaka A. Barriers to health-seeking practices during pregnancy among adolescents in rural Blantyre, Malawi. Afr J Midwifery Womens Health 2014; 8:59–65.

14. Kumbani L, Bjune G, Chirwa E, et al. Why some women fail to give birth at health facilities: a qualitative study of women's perceptions of perinatal care from rural Southern Malawi. Reprod Health 2013; 10:9.

15. Vidler M, Ramadurg U, Charantimath U, et al. Utilization of maternal health care services and their determinants in Karnataka State, India. Reprod Health 2016; 13:37.

16. Hossen Md.A & Anne Westhues A. Rural Women's Access to Health Care in Bangladesh: Swimming Against the Tide? Social Work in Public Health. 2011; 26(3); 278-293.

17. Alston M, Allan J, Dietsch E, Wilkinson J et al. Brutal neglect: Australian rural women's access to health services. *Rural and Remote Health* 2006; 6: 475. [Available from : www.rrh.org.au/journal/article/475]

18. Henderson, S. J., Bernstein, L. B., George, D. M. et al. Older Women and HIV: How Much Do They Know and Where Are They Getting Their Information*? Journal of the American Geriatrics Society.* 2004; 52(9):1549-1553.

19. Health Bulletin 2016. Directorate General of Health Services (DGHS) & MOHFW, 2016. Published in 28 January 2019. [Available from: http://app.dghs.gov.bd/localhealth Bulletin 2016/publish/publish.php?org=10000064 &year=2016 &lvl=1]

20. Mahmood N., Ali S.M. The Disease Pattern and Utilisation of Health Care Services in Pakistan. *The Pakistan Development Review.* 2002; 41(4):745–757.

21. Rahman, M., Islam, M., Islam, M., Sadhya, G., & Latif, M. Disease Pattern and Health Seeking Behavior in Rural Bangladesh. *Faridpur Medical College Journal.* 2011; 6(1), 32-37.

22. Health disparities in rural women. Committee Opinion No. 586. American College of Obstetricians and Gynecologists. Obstet Gynecol.2014; 123: 384–8. [Available from: https:/ /www.acog.org/Clinical-Guidance-and Publications/ Committee-Opinions/]

ORIGINAL ARTICLE

Hyponatremia among Adult Patients with Community Acquired Pneumonia (CAP) Admitted in a Tertiary Care Hospital

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Abstract

Introduction: Pneumonia is a common illness affecting approximately 450 million people a year and occurring in all parts of the world. Hyponatremia is one of the most common electrolyte disturbances in patients hospitalized with pneumonia and associated with higher disease severity. The aim of the study was to see the frequency of hyponatrmia among patients with pneumonia in adults and to study the significance of this finding in the clinical course and final outcome of the disease.

Methods: This prospective observational study was conducted among 80 patients with the diagnosis of pneumonia in the In-Patient Department (IPD) of Pulmonology in the Enam Medical College and Hospital (EMCH) from 1st July 2018 to 30 th June 2019. All of them underwent Chest X-ray and other relevant laboratory investigations which included CBC, blood urea, serum creatinine, serum electrolytes, blood glucose, SGPT and ABG.

Results: Eighteen out of 80 pneumonia patients had hyponatremia. The mean p^H - PaO_2 and $PaCO_2$ among hyponatremic patients were 7.35±0.04, 54.63±6.75 and 45.58±7.74 and among normonatremic patients were 7.40±0.02, 66.67±4.17 and 37.47±3.23 respectively. The mean duration of hospital stay among hyponatremic patients was 7.15±2.92 days and among normonatraemic patients was 3.04±0.80 days. About 38.88% of hyponatremic patients with Na+ less than 130 meq/L had serum and urine osmolality 254± 6.9 and115± 8.07 respectively indicating they are having SIADH.

Conclusion: Hyponatremia is a common finding among pneumonia patients. These patients had more severe type of pneumonia and also needed longer duration of hospital stay. More than one third (38.88%) of hyponatremic patients had SIADH.

Keywords: Pneumonia, Hyponatremia, SIADH

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Introduction:

Community Acquired Pneumonia (CAP) is pneumonia that has been acquired in a community in a patient who has not been hospitalized within 14 days prior to onset of symptoms or hospitalized less than 4 days prior to onset of symptoms.[1] It is a common acute infection in adults resulting in considerable clinical and economic impact.[2,3]

Hyponatremia is one of the most common electrolyte disturbances in patients hospitalized with pneumonia and associated with higher disease severity. The precise mechanism is unknown, Syndrome of inappropriate antidiuretic hormone secretion (SIADH) is most often implicated.[4] Patients with pneumonia often present with several factors that are associated with nonosmotic stimulation of antidiuretic hormone (ADH), most notably inûammatory cytokines such as interleukin-6,[5] stress, nausea, and hypoxemia.[6,7] Others implicate a reset osmostat, citing evidence for this mechanism in other infectious conditions, i.e., tuberculosis and malaria).[8,9] Patients with pneumonia may also have concomitant hypovolemia due to factors such as inadequate oral intake,

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systemic vasodilatation, and extra renal sodium losses from vomiting and diarrhea.[10] In contrast to SIADH, hypovolemia is a potent stimulus for appropriate ADH secretion through activation of the carotid baroreceptors. Primary disease, impaired water excretion, “inappropriate” release of vasopressin, use of hypotonic fluids, redistribution of sodium and water and several drugs may contribute to hyponatremia.[11]

In study by Mandal et al.[12] hyponatremia was found in 21% of the pediatric patients admitted with the diagnosis of pneumonia and they also found higher mortality (33%) among hyponatremic patients than normonatremic patients (2%).

Nair V et al.[13] found after their study that hyponatremia was present in 27.9% of the patients with pneumonia on admission and these patients were associated with greater risk of death and increased length of hospital stay. In a similar study by Karki L et al.[14] hyponatremia was a common occurrence at hospital admission with an incidence of 36.11%. Hyponatremia at admission was associated with longer length of hospital stay.

The aim of our study was to see the frequency of electrolyte disturbances in patients with pneumonia in adults and to study the significance of these electrolyte disturbances in the clinical course and final outcome of the disease.

Methods:

This prospective observational study was conducted in the In-Patient Department (IPD) of Pulmonology in the Enam Medical College and Hospital (EMCH) over a period of 1 year from 1st July 2018 to 30 th June 2019.

About 80 patients with the diagnosis of pneumonia on the basis of presence of consolidation both clinically and radiologically were included in the study. Samples are collected by nonprobable consecutive sampling. Patients with diarrhea, chronic kidney disease, heart Failure, chronic liver disease, malignancy, taking diuretics, oral rehydration salts, tuberculosis, HIV infection, chemical pneumonitis and interstitial pneumonitis were excluded.

Informed written consent was taken from all the patients. All of them underwent laboratory investigations which included CBC, serum electrolytes, blood urea, serum creatinine, blood glucose, SGPT and ABG. Chest-X ray was done and was reported by a radiologist. CURB-65 score was done for every patient.(CURB-65 score indicates pneumonia severity. It includes confusion, urea level more than 7 mmol/l, respiratory rate more than 30/min, systolic blood pressure less than 90 mm of Hg or diastolic blood pressure less than 60 mm of Hg and age more than 65 years, 01 point for each criteria).[15]

All the patients were followed up until discharge. Repeat Chest X-ray and serum electrolytes were done on the day of admission, when necessary and before discharge.

Data were analyzed using SPSS 16 computer program. A p value less than 0.05 considered significant.

Results:

A total of 80 patients were included in the study. Out of them 47 were male and 33 were female. The mean age of the patients was 55.56±16.17 years (Table 1).

Table-I

Age of patients

Total	80	56.55±16.17
Male	47	57.37±15.44
Female	33	56.06±17

05 out of 18 hyponatremic patients has CURB 65 score 1, 08 has score 2 and 05 patients are admitted with CURB 65 score 3-4.(Table II)

Table-II

CURB-65 score among hyponatremic patients

Score	No of patients
1	05
2	08
3-4	05

Among 80 patients of pneumonia 18 patients has hyponatremia, 11 patients has hypolalemia, 08 patients has combined hyponatremia and hypokalemia. Fifteen patients has respiratory acidosis and hypercapnia. Seventeen patients has hypoxia.(Table III)

Table-III

Electrolyte and ABG disturbances among pneumonia patients

Finding	No of patients
Hyponatremia (Na^+ <135)	18
Hypokalemia (K^+ < 3.5)	11
Combined hyponatremia and hypokalemia	08
Respiratory acidosis (p^H< 7.4)	15
Hypoxemia (PaO_2 < 60 mm of hg)	17
Hypercapnia ($PaCO_2$> 50 mm of hg)	15

05 patients has mild, 04 patients has moderate, 09 patients has severe hyponatremia (Table IV).

Table IV

Na^+ level among pneumonia cases

Mild hyponatremia (Na^+ level ≤124 mmol/l)	05
Moderate hyponatremia (Na^+ level 125-129 mmol/l)	04
Severe hyponatremia (Na^+ level ≤130 mmol/l)	09

Mean K^+, p^H, PaO_2, $PaCO_2$ among normo natremic patients were 3.55± 0.10, 7.40± 0.02, 66.67±4.17, 37.47±3.23 and the Mean K^+, p^H, PaO_2, $PaCO_2$ among hyponatremic patients were 3.35± 0.36, 7.35± 0.04, 54.63±6.75, 45.58±7.74 (Table V).

Table V

Biochemical and ABG findings among normal and hyponatremic patients

Traits	With normal Na^+	With low Na^+	p value
K^+	3.55± 0.10	3.35± 0.36	0.00
p^H	7.40± 0.02	7.35± 0.04	0.00
PaO_2	66.67±4.17	54.63±6.75	0.00
$PaCO_2$	37.47±3.23	45.58± 7.74	0.00

The duration of hospital stay among hyponatremic patients was 7.15±2.92 days and the duration of hospital stay among normonatremic patients was 3.04±0.80 days. The difference is statistically significant. (p value 0.00) (Table VI).

Table VI

Duration of hospital stay in days among normal and hyponatremic patients

Sodium Level	Duration of hospital stay	p value
Normal Na^+	3.04±0.80	0.00
Low Na^+	7.15±2.92	

Serum and urine osmolality among patients with Na^+ < 130 mmol/l were 254± 6.9 and 115± 8.07 and among patients Na^+ >130 were 286±6.63 and 87±14.22 respectively. (Table VII)

Table-VII

Serum and urine osmolality among hyponatremic patients

No of patients	Serum osmolality (mosm/l)	Urine osmolality (mosm/l)
With Na^+ < 130 (no 7)	254± 6.9	115± 8.07
With Na^+ >130 (no 11)	286±6.63	87±14.22

Discussion:

In the present study a total of 80 cases of community acquired pneumonia (CAP) were included. The mean age was 56.55±16.17 years. The mean age of male patients was 57.37±15.44 years and the mean age of female patients is 56.06±17 years. This finding is similar to that of Karki et al[14] where the mean age of all patients was 51.3 years. In a study conducted in 1996 by A M Neill[15] et al. among CAP patients the mean age was 58 years (range 18-97 years). So there is a predominance elderly patient who gets admitted to hospitals with community acquired pneumonia. In our study 47 patients were male and 33 patients were female. This finding is similar to that of A M Neill[15] et al where 55% were patients male but contradicts that of Karki et al[14] where 39% patients were male. All female cases are non smokers. Out of 47 males 07 were non smokers and 40 patients were smokers.

On the day of admission hyponatremia was found in 18(22.5%) patients, hypokalemia was found in 11 (13.75%) patients and combined hyponatremia and hypokalemia was found in 08(10%) patients. This is nearly similar to the study by Karki et al[14] who showed the incidence of hyponatremia is approximately one third (36.11%). In that study 26 out of 72 patients with community acquired pneumonia had serum sodium level less than 135 mmol/l at the time of hospital admission. Nair V et al[13] al also found the prevalence of hyponatremia, in the first hospital-obtained sample, to be 28% among CAP patients.

In this study severe hyponatremia (Na^+ less than 124 mmol/l) was present in 05 patients, moderate hyponatremia (Na 125-129 mmol/l) was present in 04 patients and mild hyponatremia (Na 130-135 mmol/l) was present in 09 patients. Seven out of eighteen hyponatremic (serum osmolality less than 135 mmol/lit) patients has serum sodium level less than 130 mmol/l, the mean serum osmolality 254± 6.9 mosm/l and the mean urinary osmolality 115 ±8.07mosm/l, indicating they had having SIADH. One patient with serum sodium less than 130 has plasma osmolality 290 mosm/l and urinary osmolality 80 mosm/l indicating dehydration (decreased intake or increased perspiration). However 10 other hyponatremic patients have the mean serum osmolality 286±6.63mosm/l and the mean urinary osmolality 87±14.22mosm/l indicating decreased intake or increased loss by perspiration.

Thirty, forty two and eight patients were admitted with CURB-65 score 1, 2 and 3 respectively. Among the 18 patients with hyponatremia five patients were admitted with CURB-65 score 1, 08 patients has CURB-65 score 2 and 05 patients has CURB-65 score 3. Among those with combined hyponatremia and hypokalemia 01 patient has score 1, 5 patients has 2 and 2 patients has score 3. This finding indicates that those with hyponatremia have higher CURB-65 scores.

In this study, 15(18.75%) patients has p^H less than 7.4 (respiratory acidosis), 17 (21.25%) patients has hypoxaemia (PaO_2 less than 60 kPa) and 15 (18.75%) patients has hypercapnia ($PaCO_2$ more than 50 kPa). Thirteen out of 15 patients with hypercapnia has low sodium level. So it is evident from this study that those patients with type II respiratory failure ($PaO_2 < 60$ kpa and $PaCO_2 > 50$ kPa) tends to have lower sodium (Na^+) level.

The mean duration of hospital stay of patients with normal Na^+ is 3.04±0.80 days and the mean duration of hospital stay with low Na^+ was 7.15±2.92 days. This finding is statistically significant (p value < 0.05). Three patients are shifted early (day of admission) to the ICU needing mechanical ventilation. All 03 of them has CURB 65 score 3, electrolyte imbalance and respiratory acidosis. Previous studies also have shown that hyponatremia frequently accompanies hospitalization for pneumonia and is associated with adverse outcomes. Study conducted by Nair V et al[13] and Marya D Zilbergerg [16] also concluded admission sodium was an independent predictor of mortality and morbidity outcomes in terms of hospital stay, ICU admission and the need for mechanical ventilation in patients with pneumonia.

Among patients with combined sodium and potassium deficiency (a total of 8 patients) the mean duration of hospital stay was 8.5±1.38 days. Three patients were shifted to ICU on the day of admission.

Conclusion:

Hyponatremia is a common finding in patients with community acquired pneumonia(CAP) and these patients usually presents with more severe type of pneumonia. They also have longer duration of hospital stay and some of them needed ICU support. Although the precise mechanism is not known it is a common finding in CAP patients. So we advise all patients with CAP should have electrolyte measurement and their detection and early intervention may avoid adverse outcomes.

Limitations:

The number of patients was less. The study was done in a single center. So further multicentered studies with large number of patients are needed to evaluate the incidence and impact of electrolyte disorders in hospitalized pneumonia patients.

References:

1. Bartlett J, Dowell S, Mandell L, et al. Practice guidelines for the management of community acquired pneumonia in adults. Clin Infect Dis 2003;31:347-38.
2. File TM, Marrie TJ. Burden of community-acquired pneumonia in North American adults. Postgrad Med 2010;122:130-141.
3. Welte T, Torres A, Nathwani D. Clinical and economic burden of community-acquired pneumonia among adults in Europe. Thorax 2012;67:71-79.
4. Dixon BS, Anderson RJ. Pneumonia and the syndrome of inappropriate antidiuretic hormone secretion: don't pour water on the ûre. Am Rev Respir Dis 1988;138:512–513.
5. Mastorakos G, Weber JS, Magiakou MA, Gunn H, Chrousos GP. Hypothalamic-pituitary-adrenal axis activation and stimulation of systemic vasopressin secretion by recombinant interleukin-6 in humans: potential implications for the syndrome of inappropriate vasopressin secretion. J Clin Endocrinol Metab 1994;79(4):934–939.
6. Farber MO, Roberts LR, Weinberger MH, Robertson GL, Fineberg NS, Manfredi F. Abnormalities of sodium and H2O handling in chronic obstructive lung disease. Arch Intern Med 1982;142(7): 1326–1330.
7. Reihman DH, Farber MO, Weinberger MH, et al. Effect of hypoxemia on sodium and water excretion in chronic obstructive lung disease. Am J Med 1985;78(1):87–94.
8. Miller LH, Makaranond P, Sitprija V, Suebsanguan C, Canûeld CJ. Hyponatraemia in malaria. Ann Trop Med Parasitol 1967;61: 265–279.
9. Hill AR, Uribarri J, Mann J, Berl T. Altered water metabolism in tuberculosis: role of vasopressin. Am J Med 1990; 88(4):357–364.
10. Sankaran RT, Mattana J, Pollack S, et al. Laboratory abnormalities in patients with bacterial pneumonia. Chest 1997;111(3):595–600

11. Don M, Valerio G, Korppi M, Canciani M. Hyponatremia in pediatric community-acquired pneumonia. Pediatr Nephrol 2008;23:2247-2253.

12. Partha Pratim Mandal, Madhu Garg, I.P.Choudhary. To Study the Association and Significance of Hyponatremia in Pneumonia in Pediatric Patients Treated in Hospital Setting. International Journal of Contemporary Medicine Research 2018;5(1): 11-14.

13. Nair V, Niederma MS, Masani N, Fishban S. Hyponatremia in Community Acquired Pneumonia. Am J Nephrol 2007 ; 27 :184-190.

14. Karki L, BhaweshT, Sha MK. Hyponatremia in Patients with Community Acquired Pneumonia. JNMA 2016; 54(202):67-71.

15 .Neill AM, Martin IR, Weir R, Anderson R, Chereshsky A, Epton MJ, et al Community acquired pneumonia: aetiology and usefulness of severity criteria on admission. Thorax 1996;51(10):1010-6.

16. Marya D Zilberberg, Alex Exuzides, James Spalding, Aimee foreman, Alison Graves Jones, Chris Colby, Andrew F Shorr. Hyponatremia and hospital outcomes among patients with pneumonia: A retrospective cohort study. BMC Pulmonary medicine 2008;8(16):1-7.

Morphometric Variation of Paracentral Lobule in Relation to the Hemisphere of Human Brain

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Abstract

Introduction: *The paracentral lobule is the area on the medial surface of the cerebral cortex which surrounds the indentation produced by the upper end of central sulcus on the superior border. The human paracentral lobule is an important center for micturition and defecation and control lower limb muscular activity below the knee. Any trauma, tumor, or cerebral ischemia can cause lesions of motor and sensory cortex of paracentral lobule. Size of the paracentral lobule varies from person to person. So, the adult paracentral lobule study is very important to the radiologist and clinicians for the diagnosis and treatment of related diseases. This study was carried out to observe the morphometric pattern between right and left paracentral lobule in adult male and female Bangladeshi population to establish a baseline anatomical data for future studies.*

Methods: *This cross- sectional study was conducted in the Department of Anatomy, Dhaka Medical College, Dhaka, during the period of January 2017 to December 2017. Total 70 adult Bangladeshi male & female people were selected, among them 35 were male and 35 were female, age ranging between 20-65 years. CT scan images of brain in mid sagittal view were used for the study. Data were analyzed by Paired Student's 't' test.*

Results: *The length of the motor and the sensory area and the width of the sensory area of the left paracentral lobule was significantly higher ($p<0.01$) than the right paracentral lobule. Only the width of the sensory area was found significantly higher in the right paracentral lobule.*

Conclusion: *The present study reveals significant difference in morphological measurements between right and left paracentral lobule in adult male and female Bangladeshi population.*

Key words: *Paracentral lobule, Central sulcus, Motor cortex, Sensory cortex, Morphometric Measurement, Pars marginalis*

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Introduction:

The paracentral lobule extends from precentral sulcus to postcentral sulcus on superomedial border.[1] On the medial surface of cerebral hemisphere, the paracentral lobule is bounded anteriorly by the paracentral sulcus, an ascending branch of the cingulate sulcus which is anterior to precentral sulcus, separates the paracentral lobule from the medial frontal gyrus.[2] Posteriorly the paracentral lobule is bounded by the pars marginalis, which is the ascending termination of the cingulate sulcus and separates the paracentral lobule from the precuneus. Inferiorly the paracentral lobule is bounded by the cingulate sulcus which separates it from the cingulate gyrus.[3]

A study was done comparing the right and left areas of the paracentral lobule and found the mean extrasulcal surface of the left paracentral lobule was significantly larger both in male and female which corresponds to the predominance of right handed people (90-95%).[2]

The central sulcus usually cuts into the posterior part of the paracentral lobule on the superomedial border and subdivides the lobule into anterior and posterior parts. The anterior part is continuous with the precentral gyrus (motor cortex) and posterior part is continuous with the postcentral gyrus (sensory cortex).[4] The precentral gyrus

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controls the movement of lower limb below the knee [5] and perineal region of the opposite side[1] and is concerned with the voluntary control over defecation and micturition reflexes.[6] Damage of paracentral lobule occurs from occlusion or lesion of anterior cerebral artery which causes contralateral lower limb muscle weakness or paralysis and urinary incontinence.[7,6]

Thickness of cortex (gray matter volume) of paracentral lobule decreases with age and also in many diseases such as in Alzheimer's disease[8], chronic Schizophrenia and multiple sclerosis.[9] Lesion of the primary somesthetic area of paracentral lobule results in contralateral sensory disturbances.[6]

In interstitial cystitis or painful bladder syndrome increase in gray matter thickness in primary somatosensory area (paracentral lobule) occur.[10] Increased volume and cortical thickness in the somatosensory and motor regions including bilateral paracentral lobule develops trigeminal neuralgia,[11] and migraine.[12] This lobule might be a primary site for tumors and focal seizures.[3]

So, anatomy of the paracentral lobule has a great importance. The present study was an effort in that issue using data collected as Computed Tomography (CT) scan images of brain through Compact Disc (CD) from Radiology and Imaging Department of Dhaka Medical College and Hospital. CT scan provided more detailed information about structure of brain than regular radiographs (x-ray).[13]

Methods:

This cross sectional study was conducted in the Department of Anatomy, Dhaka Medical College, Dhaka, during the period between January 2017 to December 2017. Seventy adult Bangladeshi people, among them 35 male and 35 female, age ranging from 20-65 years were included in this study. The subject of this study were selected from the Radiology & Imaging Department of Dhaka Medical College & Hospital attending for CT scan of brain advised by their physicians. This study was carried after permission from Ethical Committee. Subject were selected purposively and informed written consent was taken. Normal CT scan images of brain in mid sagittal view of both cerebral hemispheres were collected. For this study, reconstructed mid sagittal view of both cerebral hemispheres were taken since the paracentral lobule was visible in this way and these images were viewed on a computer monitor for editing and magnifying. It was magnified at 100%. These images were transferred to a CD. Different dimensions of paracentral lobule were measured from these images by using computer with image measuring software program (DICOM version 4.0.3.).

Due to a total absence of clear morphological landmarks, measurement was standardized by using intercommissural or CA-CP line (CA- anterior commissure, CP- posterior commissure)) line system in order to increase precision of data [2]. Paired student's 't' test was done for statistical analysis of the results. P value <0.05 was taken as of significance.

Results:

In this study, mean maximum length of motor area of the right paracentral lobule was 25.91±1.84 mm & the left paracentral lobule was 26.52±1.68 mm in male. In female, mean maximum length of motor area of the right paracentral lobule was 24.56±1.98 mm & the left paracentral lobule was 25.55±1.80 mm. In male, mean maximum width of motor area of the right paracentral lobule was 23.78±2.30 mm and the left paracentral lobule was 24.39±2.01 mm. Mean maximum width of motor area of the right paracentral lobule was 22.43±2.00 mm and the left paracentral lobule was 23.34±1.81 mm in female. The maximum length of motor area was higher in left paracentral lobule than right both in male and female and the result was statistically significant ($p<0.001$). The maximum width of motor area of left paracentral lobule was significantly higher than right both in male and in female and the result was statistically significant ($p<0.001$). (Table I).

Table I

Maximum length and maximum width of motor area between right and left paracentral lobule in male and female

Variable	Right (Mean±SD)	Left (Mean±SD)	p value
Maximum length of motor area of male (mm) (n=35)	25.91±1.84 (23.12 30.24)	26.52±1.68 (23.12 30. 1)	0.0001***
Maximum length of motor area of female (mm) (n=35)	24.56±1.98 (21.01 27.74)	25.55±1.80 (21.93 28.61)	0.0001***
Maximum width of motor area of male (mm) (n=35)	23.78±2.30 (18.76 29.65)	24.39±2.01 (20.61 30.52)	0.001**
Maximum width of motor area of female (mm) (n=35)	22.43±2.00 (17.22 25.76)	23.34±1.31 (18.84 27.40)	0.0001***

Comparison between right and left paracentral lobule was done by Paired Student's 't' test.
** = significant at $p<0.01$, *** = significant at $p<0.001$.

Table II

Maximum length and maximum width of sensory area between right and left paracentral lobule in male and female

Variable	Right (Mean±SD)	Left (Mean±SD)	p value
Maximum length of sensory area	20.79±2.54	21.32±2.41	0.003**
of male (mm) (n=35)	(16.34-27.33	(16.51-28.28)	
Maximum length of sensory area	19.33±2.66	20.06±2.47	0.0001***
of female (mm) (n=35)	(15.24 -24.37)	(16.45-24.83)	
Maximum width of sensory area	10.62±1.47	9.73±1.14	0.0001***
of male (mm) (n=35)	(6.36-15.31)	(7.63-13.30)	
Maximum width of sensory area	10.06±1.43	9.33±1.36	0.004**
of female (mm) (n=35)	(7.00-14.01)	(6.58-12.31)	

Comparison between right and left paracentral lobule was done by Paired Student's 't' test.
** = significant at p<0.01, *** = significant at p<0.001.

In male, mean maximum length of sensory area of the right paracentral lobule was 20.79±2.54 mm and the left paracentral lobule was 21.32±2.41 mm. Among female, mean maximum length of sensory area of the right paracentral lobule was 19.33±2.66 mm and the left paracentral lobule was 20.06±2.47 mm. In male, mean maximum width of sensory area of the right paracentral lobule was 10.62±1.47 mm and the left paracentral lobule was 9.73±1.14 mm. In female, mean maximum width of sensory area of the right paracentral lobule was 10.06±1.43 mm and the left paracentral lobule was 9.33±1.38 mm. It was found that the length of sensory area of left paracentral lobule was significantly higher than right both in male & female and the result was statistically significant (p<0.01). The maximum width of sensory area was significantly higher in right paracentral lobule than left both in male and in female and the result was statistically significant (p<0.001). (Table II).

Discussion:

In the present study, the length of motor area of left paracentral lobule was higher than right both in male and female. Statistically significant difference was observed between right and left paracentral lobule. The width of motor area of the left paracentral lobule was higher than the right both in male and female. Statistically significant difference was also observed between right and left paracentral lobule. Neto [3] (2014,) carried out a study in Brazil on postmortem brain of 42 hemispheres, 22 from the right and 20 from the left hemispheres. Information as to age and sex was not available. Using a digital caliper rule, they recorded length and width of motor and sensory area of right and left paracentral lobule and did not find any significant difference between the lengths of the regions analyzed in the paracentral lobule in their study subjects. They measured the width of paracentral lobule in transverse axis and significant difference was not found in their study subjects. They found that average width of motor area was larger in left than right paracentral lobule but did not publish separate data regarding male and female. The findings of the present study were almost within normal range and also similar to the findings of that study.

In the present study, the length of sensory area of left paracentral lobule was higher than right in male and female. Statistically significant difference was also observed between right and left paracenyral lobule. In this study, the width of sensory area was significantly higher in right paracentral lobule than the left both in male and female. Statistically significant difference was also found between right and left. On the other hand, similar observation were found by Neto[3] and recorded the length of paracentral lobule in the sagittal axis. But they did not publish any data regarding the length of sensory area. They stated that the motor area showed larger length in relation to the sensory area in the analysis of two hemispheres. Neto[3] mentioned no significant difference in width of sensory area of the right and left paracentral lobule in their study subjects.

Review of existing literature reveals that few works have been done on this topic in other countries. As there is no available published work concerning measurements of the paracentral lobule in our country. So, the result of the present study was compared with the findings of other researchers of abroad. Some dissimilarities were noticed among the findings of present study and the studies conducted by other researchers, may be due to mixture of different age and races, different geography, use of cadaveric brain instead of CT scan image from living subject, variation in the radiograph and taking the measurement in different technique.

The result of the present study can be used for future researches and the findings of this study might be useful in providing data for the anatomists, radiologist, neurosurgeons, and forensic experts.

Conclusion:

From this study, it can be concluded that there are mostly significant difference between right and left paracentral lobule in male and female. The maximum length of motor and sensory area and maximum width of motor area has been found significantly higher in left paracrntral lobule both in male and female. This may be due to left dominance of brain [2]. Maximum width of sensory area have shown significantly higher in right paracrntral lobule both in male and female. The study findings suggest that morphological measurements of the paracentral lobule dimensions reveal significant difference between right and left in adult Bangladeshi male and female people that may have anatomical and clinical importance.

Limitations:

The present study was conducted in a single center may not be fully representative of whole community of Bangladesh. So far known, no published article was available on the paracentral lobule among Bangladeshi people, so comparison could not be done here. Few numbers of publications of similar study were available done by researchers of other countries to compare with the findings of present study. So, morphological parameters could not be compared properly with the present study. The result of this study might be more accurate if correlation could be done with some other variables such as age, height, race, education and occupation etc.

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References:

1. Crossman, A.R., 2008, Cerebral Hemisphere, In: S. Standring, 40th ed. 2008, *Gray's Anatomy – The Anatomical Basis of Clinical Practice,* London: Churchill Livingstone, pp.335-357.
2. Spasojeviæ, G., Malobabic, S., Spasojeviæ, O., Macut, N.D. & Malikoviæ, A., Feb 2013. Morphology and digitally aided morphometry of the human paracentral lobule. Folia Mophol (Warsz) [Internet]. [access 2017 April 10]; 72(1): pp.10-16.
3. Neto, M.O., Nascimento, P.A., Rodrigues, R.B., Oliveira, W., Oliveira, L.S. & Silva, A.R., 2014. Morphometric analysis of the Paracentral lobe. *Health Biology. Science*; vol 2, number 2(1): pp.19-22.
4. Gyton, A.C., Hall, J.E., 2013. *Textbook of medical physiology*. 12th ed. New Delhi: Elsevier, pp.677-728.
5. Duvernoy, H.M., 1991. The human brain; surface, three-dimensional sectional anatomy and MRI. *Springer-Verlag, Wien*-New York, pp.28–29
6. Snell R. S., 2008. THE CEREBRUM, In: *Clinical Neuroanatomy.* 7th edition. Philadelphia: Lippincott Williams and Wilkins, p.261-295.
7. Woessner, H., Vibhute, P. & Barrett, K., 2012. Acute Loss of Bladder Control in a Stroke of the Frontal Cortex. *The Neurohospitalist.* 2(4).pp. 129-131.
8. Ohnishi, T., Matsuda, H., Tabira, T., Asada, T. & Uno, M., 2001. Changes in brain morphology in Alzheimer disease and normal aging: is Alzheimer disease an exaggerated aging process. *AJNR Am Journal Neuroradiology.* 22: pp.1680-1685.
9. Sailor, M., Fischl, B., Salat, D., Templemann, C. & Busa, E., 2003. Focal thinning of the cerebral cortex in multiple sclerosis. *Brain.* 126: pp.1734-44.
10. Kairys, A.E., Schmidt-Wilcke, T., Pulu, T., Labus, J.S., Martucci, K., Farmer, M.A., Mackey, S. & Harris, R.E., 2015. Increased Brain Gray Matter in the Primary Somatosensory Cortex is Associated with Increased Pain and Mood Disturbance in Interstitial Cystitis/Painful Bladder Syndrome. *Journal Urology.* 193(1): pp.131-137.
11. Desouza, D.D., Moayedi, M., Chen, D.Q., Davis, K.D. & Hodaie, M., 2013. Sensorymotor and Pain Modulation Brain Abnormalities in Trigeminal Neuralgia. *Plos one.* 8(6): e66340.
12. DaSilva, A.F., Granziera, C., Synder, J. & Hadjikhani, N., 2007. Thickening in the somatosensory cortex of patient with migraine. *Neurology.* Vol. 69(21). pp. 1990-1995.
13. Haaga, J.R., 2003. *CT and MRI of The Whole Body,* 5th edition. pp.5-8, 2612-2633.

ORIGINAL ARTICLE

Perfusion Index as a Predictor of Hypotension Following Subarachnoid Block in Elective Caesarean Section: A Prospective Study

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Abstract

Introduction: Caesarean section is one of the most common procedures and commonly causes hypotension following subarachnoid block as a result of sympathectomy. As a result, there is venous pooling, so cardiac output decreases, which leads to hypotension. It becomes a major medical challenge to overcome. Various methods and agents has been applied to solve this problem. Perfusion index (PI) is one of such attempt to address the problem of hypotension. It may give a predictive value about which group of parturient may develop hypotension. The aim of the study was to use the non-invasive perfusion index data to predict the occurrence of hypotension in a parturient, so that it will help us to guide fluid and other drug therapy to address the problem of hypotension.

Methods: It was a prospective, observational study. This study was conducted in Department of Anaesthesia, Analgesia, Palliative and Intensive care medicine of Dhaka Medical College and Hospital from March 2017 to September 2019. Data were collected after approval from ethical review committee on January 2019. Total 80 patients were divided into two groups (40 in each) according to their base line perfusion index.

Results: The groups (group-I, PI of which was ≤3.5 & group-II, PI of which was > 3.5) were well matched for their demographic data. The mean age, height, weight and BMI were almost similar on both groups. The baseline readings of heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) were almost similar in both groups. Single episode of hypotension developed in 6 (12.5%) patients of group-I, and 20 (50%) of group-II. Multiple episodes of hypotension in 2 (5%) patients of group-I, and 4 (10%) of group-II. A total of 8 (20%) patients developed hypotension in group-I and 24 (60%) in group-II. The difference was statistically significant (p<0.05) among two groups.

Conclusion: Perfusion index can reliably predict the hypotension, which may occur following subarachnoid block. So, it can be a great tool in obstetric anaesthesia.

Key words: Perfusion index, Hypotension, Subarachnoid block

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Introduction:

Caesarean section is a common procedure and hypotension is the most commonly observed adverse event after subarachnoid block and have an incidence of 70%-80% for caesarean section.[1]

Hypotension may results in nausea and vomiting, loss of consciousness, aspiration, cardiac arrest and death of mother if not managed promptly. Fetal complications include low APGAR score, fetal hypoxia, distress, fetal acidosis, and brain damage. The anaesthesiologist is the chief person to maintain a normal or nearly normal physiology, and the only person to overcome the complications that may arise during anaesthesia and surgery.

As management of hypotension is crucial, so prior prediction of severe hypotension following subarachnoid

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block during caesarean section is necessary. Many study has done to predict this hypotensive effect before anaesthesia is conducted.

Perfusion index (PI) is relatively a newer method to address the problem of hypotension. This is the ratio of pulsatile blood flow to non pulsatile blood flow in the peripheral vascular tissue, measured by a pulse oximeter based on the amount of infrared light absorbed. Pulse oximeter sensor calculate the PI, where pulsatile signal is divided by non-pulsatile signal and expressed as percentage.[2]

So, PI= (Pulsatile blood flow ÷ Non pulsatile blood flow) × 100.

PI indicates the initiation of general and epidural anaesthesia. Increasing in PI value indicates that there is vasodilatation and increased perfusion, which occurs after successful anaesthesia.

Various researcher of different countries suggested that perfusion index can be an important predictor of hypotension following subarachnoid block in caesarean section.[3,4,5,6] On those studies, they showed that when pre anaesthetic PI value is more than a defined range, there is increased incidence of development of hypotension in parturients undergoing caesarean section. So, the aim of this study was to assess the effectiveness of perfusion index to predict hypotension following subarachnoid block in elective caesarean section.

Methods:

This prospective observational study was conducted to assess the ability of perfusion index to predict about hypotension that might occurs after subarachnoid block in a parturient undergoing elective caesarean section at Dhaka medical College, Dhaka. Purposive sampling technique was adopted to select the sample population. A sample of 80 respondents was selected for study who were willing to participate and to provide required information.

Inclusion criteria were gestational age between 36-41 weeks, patients between 18-35 years of age. Any abdominal or gynaecological malignancies, patients with ante partum haemorrhage, pre-eclampsia, eclampsia, patients with coagulation disorders, patients with cardiovascular disease were excluded from study. The respondents were divided into two groups according to their baseline perfusion index. PI $\leq$3.5 was posted in Group-I and PI>3.5 was posted in Group-II.

All parturients were evaluated on the day or before the day of caesarean section. The parturients were kept fasting for at least 6 hours or rarely more hours, according to their individualized schedule of operation. To complete the whole procedure of data collection, two anaesthesiologists were required for blinding purpose. In operation theatre, one anaesthesiologist other than principal researcher recorded parturient's height & weight, and calculate body mass index (BMI). Intravenous infusion of Hartmann's solution was given at a volume of 15ml/kg over 15 minutes as preload.[7] Inj. Ondansetron, inj. Ranitidine was also given 15 minute prior to subarachnoid block. After preload, the baseline values (HR, BP, perfusion index) were recorded in supine position. Here the baseline perfusion index was the main parameter, as its value could give clue about hypotension of parturients following subarachnoid block. This gives an idea about vascular tonicity and perfusion status of that particular area, where the pulse oximiter probe is attached. If the baseline value is more, it will indicate that- there is less vascular tone and vice versa. Tonicity of that particular area may reflect the vascular tonicity of the whole body, specially the peripheral parts of the body. PI was measured by a specific pulse oximeter (Charmcare CX 100) which was attached to the right index finger of all parturients to ensure uniformity in measured PI values.

Subarachnoid block was performed by principal researcher and was blinded of baseline PI. Quincke's 25 gauge spinal needle was introduced in sitting position & 10 mg of bupivacaine 0.5% (hyperbaric) was given at the L3–L4 or L2–L3 inter space.[6] During this time pulse oximeter was disconnected to prevent bias. The parturient was returned to the supine position with a left lateral tilt of 15° to facilitate left uterine displacement,[8] both legs were slightly elevated[9] without head down to facilitate venous return. Pulse oximeter was reconnected to monitor the parturient till the end of surgery. Oxygen was given through oxygen mask at 5 L/min.

Hartmann's solution was administered at a rate of 100ml/10 min. The level of sensory block was checked and after confirmation of height of block achievement up to T6,[6] procedure (caesarean section) was started. Blood pressure was recorded at 2 min intervals after the subarachnoid block up to 10 minutes and then at 10 minutes intervals upto 30 minutes, and then 30 minutes interval till the end of surgery. Mean arterial pressure (MAP) was calculated by the formula of MAP= DBP+ (SBP-DBP)/3. Hypotension was defined as a decrease in MAP <65 mmHg[4,5] and treated with 5 mg injection ephedrine intravenously and 100 ml of Hartmann's Solution. The first hour following subarachnoid block was considered for anaesthesia induced hypotension.[3,4] Bradycardia was defined as HR

<60 beats/min and treated with injection atropine 0.6 mg IV slowly after dilution. After delivery of the baby, injection oxytocin 10 units were given intravenously slowly & another 10 unit oxytocin was given in 500ml of normal saline infusion.[10] Parturients requiring additional oxytocics and/or additional surgical interventions were excluded from the study. The incidence of other side effects such as nausea, vomiting, shivering, if observed was recorded. After completing whole of the procedure, the baseline data was collected, and filled in the prefixed data sheet.

Ethical implication:

Prior to the commencement of this study, the research protocol was approved by the Ethical Review Committee of Dhaka Medical College, Dhaka. The aims and objective of the study along with its procedure, risk and benefits were explained to the parturients, in easily understandable local language and then informed consent was taken from each parturient. It was assured that all records would be kept confidential and the procedure would be helpful for both the physician and patients in making rational approach regarding management of the case.

Results:

Total 81 patients were included in the study. One parturient was excluded due to inadequate level of the spinal blockade. Forty patients were in Group I and forty patients were in Group II for final analysis. The demographic parameters such as age, weight and height were comparable between the two groups (Table I).

Table I

Comparison of demographic characteristics between two groups

Parameter	G-I (n=40) PI≤3.5	G-II (n=40) PI>3.5
Age in years, mean (range)	24.03 (18-33)	25.38 (18-35)
Height in cm, mean (range)	152 (147-164)	151 (140-157)
Weight in kg, mean (range)	64.25 (47-89)	63.9 (46-90)

The mean PI value in Group I was 2.87 and in Group II was 6.36.

The difference of mean SBP at 2 min, 4 min and 6 min were significant between groups, The difference of mean DBP and MAP at 4 min was statistically significant between groups. All the values (SBP, DBP, MAP) following SAB were lower in group II than in Group I (Figure 1).

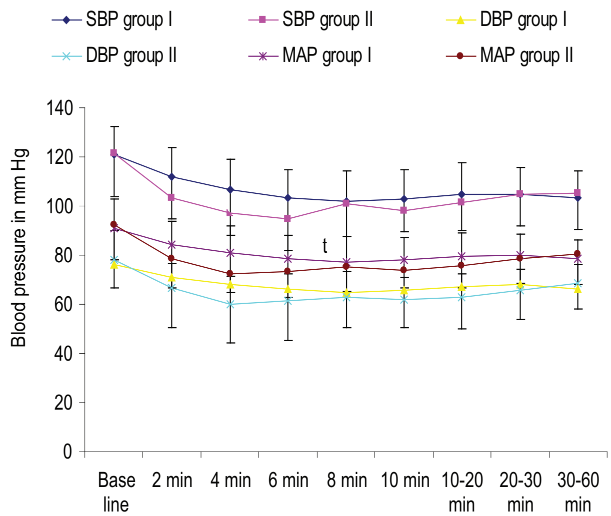

Figure 1: *Comparison of systolic blood pressure, diastolic blood pressure and mean arterial pressure between the two groups intraoperatively. Systolic, diastolic and mean arterial pressure values presented as mean ± standard deviation. Statistical analysis done using independent t-test P>0.05*

Hypotension was found in 8/40 (20%) parturients of group-I and 24/40 (60%) parturients of group-II, which were clinically significant. Single episode of hypotension developed in 6 (12.5%) parturients of group-I, and 20 (50%) of group-II. Multiple episodes of hypotension in 2 (5%) parturients of group-I, and 4 (10%) of group-II.

Table II

Number of episodes of hypotension, nausea and/ or vomiting.

Parameter	G-I (n=40) PI≤3.5	G-II (n=40) PI≤3.5	P-value
Nausea and/ or vomiting	0	9	
Episodes of hypotension			
No hypotension	32	16	<0.001
Single	6	20	
Multiple	2	4	

Spearman’s rank correlation show positive correlation (r=0.375;p=0.001) between baseline PI against the episode of hypotension (Figure 2).

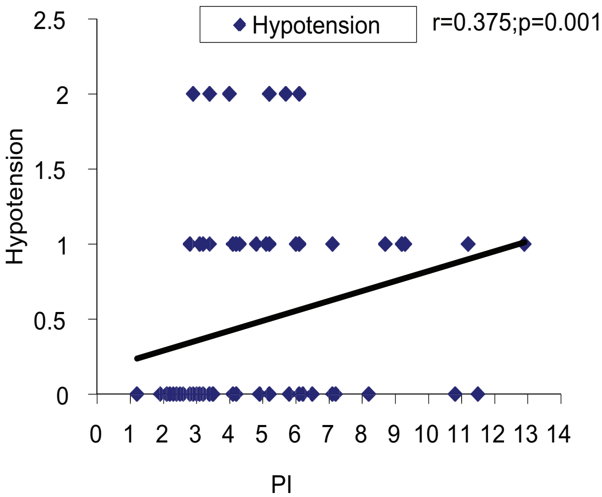

Figure-2: *Scatter diagram showing positive correlation (r=0.375;p=0.001) baseline PI with number of episode of hypotension.*

The ROC curve yielded 3.75 as a more appropriate cutoff with a 77.4% sensitivity and 67.3 specificity. The area under the ROC curve (AUC) was 0.736 (Figure 3).

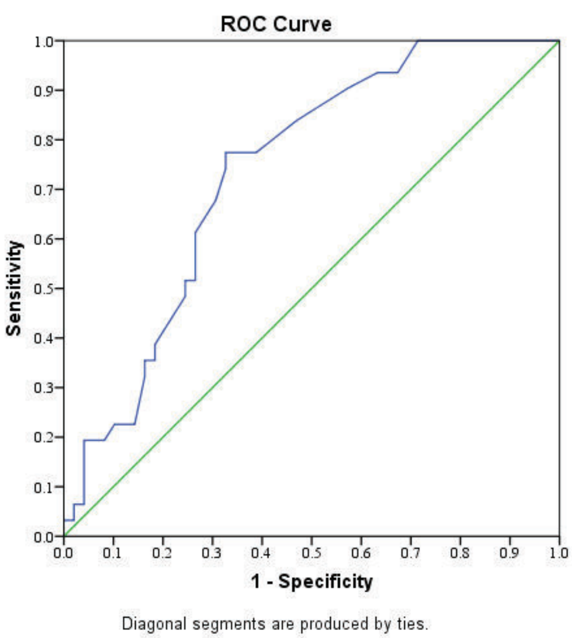

Figure-3: *ROC curve depicting baseline PI against incidence of hypotension.*

Cut of value	SEN	SPE	AUC	Asymptotic 95% CI	
				Lower bound	Upper bound
3.75	77.4	67.3	0.736	0.628	0.844

Discussion:

Perfusion index (PI) is a new tool that represents a noninvasive measurement of peripheral blood flow. It gives a result by measuring the ratio of pulsatile blood flow to the nonpulsatile or static blood in peripheral tissue such as in a fingertip, toe, or ear lobe. It indicates the status of the microcirculation which is innervated by sympathetic nerve fibres.[11] Its normal range is 0.02% to 20%, where lower PI indicates lower perfusion as well as weak pulse volume clinically and higher PI indicates the opposite. Clinical studies suggest that, it can be used as an early indicator of onset of general anaesthesia or regional anaesthesia, and also in neonatal care settings.

This prospective study was carried out with an aim to find out the predictability effect of perfusion index for development of hypotension following subarachnoid block in elective caesarean section. Parturients were divided into two groups of forty in each by their baseline perfusion index record. Parturients whose baseline PI was ≤3.5 were considered as group-I, parturients whose baseline PI was >3.5 were considered as group-II. The present study findings were discussed and compared with previously published relevant studies.

In this present study, it was observed that. The mean age was 24.03±4.69 years in group-I, 25.38±5.38 years in group-II. The difference was statistically not significant (p>0.05) among two groups.

The baseline values of HR, SBP and DBP were almost similar in both groups, but the baseline perfusion indexes were 2.84±0.55 for group-I & 6.37±2.33 for group-II. The difference of baseline PI was statistically significant (p<0.05) among two groups. In the study of Varghese, R. (2018), baseline PI was almost like this (2.69 and 7.18).

In this current study, the mean height was 1.52±0.03 m in group-I, 1.51±0.04 m in group-II. The mean weight was 64.25±9.88 kg in group-I, 63.9±11.41 kg in group-II. The difference was statistically not significant (p>0.05) among two groups.

Hypotension was defined as a mean arterial pressure <65 mmHg following subarachnoid block, during the 1st one hour of operation. Duggappa et.al (2017) and Varghese, R (2018) also accepted this value to define hypotension. Hypotension was found in 8/40 (20%) parturients of group-I and 24/40 (60%) parturients of group-II. Study by Toyama et al. (2013) showed 60% of their study population developed hypotension, among which more of the parturient's baseline PI was >3.5. (Value derived from the ROC curve). In another study by Duggappa et al. (2017) revealed hypotension for 10.5% parturients in group-I (PI≤3.5) and 71.42% in group-II (PI>3.5), new cut of value was 3.85 derived from ROC curve. Study of Varghese, R. (2018) revealed 86.67% development of hypotension in higher baseline PI group, whereas it was only 6.67% in lower PI group.

In this study, the incidence of hypotension were more in those with PI > 3.5 with a 77.4% sensitivity and 67.3% specificity. Toyoma et al (2013) found 81% sensitivity and 86% specificity. In a study of Duggappa et.al. (2017), they found sensitivity of 89.29% and specificity of 69.84%, whereas in the study of Varghese, R (2018), the sensitivity was 86.67% and specificity was 93.33%, George, J. et.al (2019) found sensitivity of 80% and specificity of 60% in their study.

In this current study significant correlation between baseline PI >3.5 and number of episodes of hypotension was observed, which was similar to study by Toyama et al. (2013), Duggappa et al. (2017), Varghese, R (2018) and George, J et al. (2019) but in a study by Yokose et al. (2015) showed that PI has no predictive value[12] for hypotension in parturients undergoing caesarean section by subarachnoid block.

Through this discussion, we found many studies suggested about the prediction ability of PI for hypotension. In this current study, there is also a correlation between PI and incidence of development of hypotension. Therefore, it can be inferred that the baseline PI can be successfully used as tool for predicting hypotension following subarachnoid block in caesarean section.

Conclusion:

Perfusion index can reliably predict the hypotension, which may occur following subarachnoid block. So, it can be a great tool in obstetric anaesthesia.

Limitations:

In this study, invasive blood pressure was not recorded. However, arterial cannulation is not appropriate for uncomplicated elective caesarean section.

Perfusion index can easily decreased by sympathetic activation during stress and anxiety.

Base line values were recorded in supine position, whereas intra operative values were recorded in 15^{o} left lateral tilt.

References:

1. Mercier F., Augè M., Hoffmann C., Fischer C., LeGouez A. Maternal hypotension during spinal anesthesia for caesarean delivery, Minerva Anestesiol, January, 2013, 79(1), 62-73.
2. Kumar A., Nadkarni AV. The variability of perfusion index as a new parameter in different types of anaesthesia techniques and its correlation with surgical stress and recovery from anesthesia: An observational clinical study, JMSCR, 2017, Vol.05, Issue.01, Page 15196-15265.
3. Toyama S., Kakumoto M., Morioka M., Matsuoka K., Omatsu H., Tagaito Y. et al. Perfusion index derived from a pulse oximeter can predict the incidence of hypotension during spinal anaesthesia for caesarean delivery, Br J Anaesth, 2013, 111, 235 41.
4. Duggappa DR., Lokesh M., Dixit A., Paul R., Rao R., Prabha P. Perfusion index as a predictor of hypotension following spinal anaestheia in lower segment caesarean section, Indian J Anaesth, 2017, August, 61(8), 649–654.
5. Varghese R. Perfusion index assessed from a pulse oximeter as a predictor of hypotension during subarachnoid block for caesarean section, JMSCR, 2018, Vol. 6, issue-5, p: 427-31.
6. George J., Valiaveedan S., Thomas M. Role of perfusion index as a predictor of hypotension during spinal anaesthesia for caesarean section-A prospective study, JMSCR, 2019, Vol. 07, Issue-03, Page 1208-1216.
7. Salama A., Goma H., Bassant M., Hamid A. Fluid preloading versus ephedrine in the management of spinal anesthesia-induced hypotension in parturients undergoing cesarean delivery: a comparative study, Ain-Shams J Anesthesiol, 2016, 9, 72–75.
8. Pakhare V., Kalyani S., Satya D., Chaitanya R., Kannuri M., Nagarjuna A. A randomized prospective study to compare the effect of wedge, manual displacement of uterus and no intervention, to reduce the hemodynamic effects of aortocaval compression in parturients undergoing caesarean section under subarachnoid block, Int J Med Res Prof, 2017, 3(3), 28-32.
9. Hasanin A., Aiyad A., Elsakka A., Kamel A., Fouad R., Osman M., et.al, Leg elevation decreases the incidence of post-spinal hypotension in cesarean section: a randomized controlled trial, BMC Anesthesiology, 2017, (17:60), p 1-6.
10. Lee A., Wong C., Healy L., Toledo P. Impact of a third stage of labor oxytocin protocol on cesarean delivery outcomes, Int J Obstet Anesth, 2014, (23), 18–22.
11. Mehandale SG., Rajasekhar P. Perfusion index as a predictor of hypotension following propofol induction - A prospective observational study, Indian j anaesth, 2017,Vol. 61, Issue.12, P-990-995.
12. Yokose M., Mihara T., Goto T. The predictive ability of non-invasive haemodynamic parameters for hypotension during caesarean section: a prospective observational study, Anaesthesia, 2015, 70, 555–562

REVIEW ARTICLE

Cubitus Varus Deformity Correction by Surgical Methods

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Abstract

Cubitus varus deformity is the most common late complication of supracondylar fractures in children. Various methods of osteotomy have been proposed for the treatment of this deformity. This study details the surgical technique and advantages and complications of the 4 most commonly used techniques of cubitus varus correction in paediatric group. Specifically, the lateral closing-wedge osteotomy, step-cut osteotomy, dome osteotomy, and multiplanar osteotomy. Each technique shown to have its own advantage and complications, no technique was shown to significantly affect the surgical outcome. We recommend that surgeon should choose surgical technique most suited to deformity of the patient.

Key words: Cubitus Varus deformity, Supracondylar fractures, Osteotomy

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Introduction:

Average carrying angle is 6°-14° with more angle in girls than in boys.[1] Any reduction in the normal carrying angle of the elbow produces cubitus varus deformity, which is the common late complication of supracondylar fracture in children.[1, 2] Incidence of this deformity varying from 4% to 58%.[3, 4] It is a triplaner deformity consisting of varus angulation in coronal plane, internal rotation in axial plane, and extension in the sagittal plane.[5]

Pediatric cubitus varus is considered a cosmetic problem with minimal loss of motion although the arc of motion maybe altered to increase hyperextension and decreased elbow flexions.[5-7] Remodeling of the very young, skeletally immature elbow may restore loss of elbow flexion.[8] Even in the absence of functional problems, which are mostly late sequelae, parents are often dissatisfied with the appearance of their child's arm and request treatment. [5]

In recent times, there is growing awareness of long-term complications of cubitus varus deformity that appears in the adult. These are Postero-lateral rotational instability, Ulnar neuropathy, Progressive varus of the ulna.[5, 7]

For correction of cubitus varus, there is different surgical techniques and complications after correction is also not uncommon.[5-8] In this review, most common type of osteotomies to correct this deformity will be described to understand advantages and complications of each methods.

Biomechanical & morphological alterations

O'Driscoll et al[9] reported 25 adult elbows with cubitus varus who developed symptomatic posterolateral rotatory instability (PLRI) decades after their initial injury. Varus malalignment of the upper extremity leads to medial displacement of the mechanical axis of the upper extremity. With time, increased attenuation of the lateral elbow ligament complex combined with increased external rotation of the ulna leads to PLRI and radial head sublaxation. Surgical treatment consisted of lateral ulnar collateral ligament (LUCL) reconstruction, distal humeral osteotomy, or a combined LUCL reconstruction with distal humeral osteotomy.

Ulnar nerve palsy has been reported in conjunction with cubitus varus.[10-12] It is thought that internal rotation deformity of the distal humerus in conjunction with distal fibrosis and entrapment of the nerve cause traction injury. In these cases, ulnar nerve transposition is recommended in conjunction of with corrective osteotomy. [7]

Snapping of the medial portion of the triceps may occur from the medial displacement of the triceps as wee as the internal rotation of the distal humerus.[7]

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It is hypothesized that the medial over pull of the triceps leads to bony morphologic changes, which is turn leads to progressive varus of the ulna. These include trochlear overgrowth posteriorly, capitullum overgrows distally, and diameter of the radial head enlarges. The ulna shifts to a more distal and medial position accompanied by increased external rotation and flexion. Thus, there is a progressive varus of the ulna.[7]

Surgical correction

There are multiple reported techniques for the correction of cubitus varus – [5-7]

A. Lateral closing wedge osteotomy

B. Step-cut osteotomy

C. Dome osteotomy

D. Computer aided multiplanar osteotomy

E. External fixation with distraction osteogenesis.

Additional lateral ulnar collateral ligament (LUCL) reconstruction has been described in conjunction with distal humerus osteotomy to correct PLRI and cubitus varus in adult.[9, 13, 14]

A. Lateral wedge osteotomy

The lateral close wedge osteotomy is most commonly used for cubitus varus because of its ease and simplicity.[15] Siris first described a lateral close wedge osteotomy for cubitus varus in 1939.[5] In 1959 French recommended a modification of the technique, along with simultaneous correction of internal rotation via the preservation of medial cortical and periosteal hinge, and fixation with two offset screws and tension band.[16]

The principle behind close wedge osteotomy is to plan a distal cut parallel to the joint line and a proximal cut perpendicular to the long axis of the humerus.[6] Some surgeons prefer to completely cut the medial cortex, where others have recommended leaving a medial cortical hinge. Leaving an intact medial cortex allows lesser fixation methods such as pins.[17]

When pin fixation is planned, it is helpful to first place 2 Kirscher wires in the lateral condyle distally, so that when the wedge is removed, the pins can be driven across the osteotomy site. If additional fixation is required, third wire or a lateral plate can be used. Plate fixation may have an advantage over pin fixation is allowing earlier mobilization, but it requires a more extensive dissection and is more technically demanding.[6]

B. Step-cut osteotomy

The concept of a step-cut osteotomy arose combat the lateral condylar prominence. A paratricipital or olecranon osteotomy approach is used to allow wide exposure of the distal humerus. A close wedge osteotomy is performed. The inferior margin of the triangle is made parallel to the joint line 0.5cm above the olecranon fossa. The second line is drawn from medial distal to proximal lateral to make the desired angle of correction. The inferior margin is equal in length to the second line. Next from lateral end of second line a third perpendicular line is drawn distally meeting the first line. This outlined triangle is now removed. A triangular notch of bone is resected from the proximal fragment to match the distal fragment. The horizontal correction of distal fragment is completed by translating distal fragment on the proximal fragment. This translation step-cut is modification of the traditional step-cut described by De Roza and Graziano where the distal fragment having a lateral spike is fixed to the proximal fragment.[6, 18]

Another modification of the traditional step-cut osteotomy is the spike translation modification step-cut osteotomy. Here a notch is made in the proximal fragment to accommodate the distal fragment spike. It is more difficult to perform spike osteotomies on smaller and younger paediatric patients. Spike osteotomies require a large bone resection compared with translation step-cut osteotomies and lateral-closing wedge osteotomies. [6-18]

C. Dome osteotomy

The dome osteotomy is more technically demanding than either the lateral wedge or the step-cut osteotomy.[19] The dome osteotomy avoids the lateral prominence produced by lateral closing-wedge osteotomy.[6] The lateral condylar prominence is decreased because the axis of rotation for the dome osteotomy is at the centre of the distal humerus, obviously the need for the lateral translation. In addition, rotational deformity can be corrected.[20]

The centre of dome osteotomy (point A) is the point at which the midline axis of the humerus intersect with the upper margin of the olecranon fossa (Figure 1). From point A, the base segment line AB is marked perpendicular to the midline axis of the humerus. Line AB´ is then drawn parallel to the distal humeral articular surface. The length of AB´ determines the radius of the dome osteotomy. The area of dome osteotomy is marked with K-wires and drilled with 3-0 cannulated drill bit. A osteotome of a oscillating saw is used to finish the dome. Point B´ on the distal fragment is rotated to point B to correct the deformity and fixed with K-wires. In older children and teenagers, distal humeral plates are used.[6]

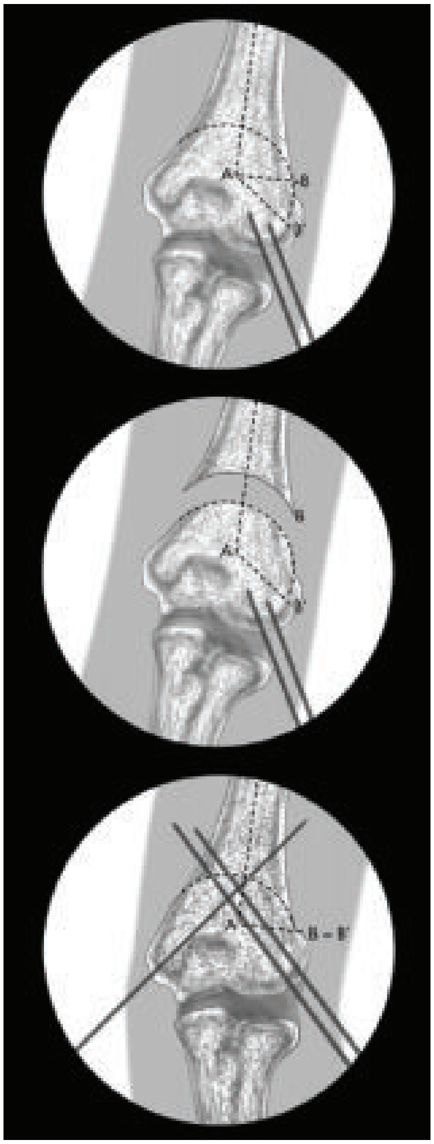

Fig.-1: *The dome osteotomy. Point A marks intersection of midline axis of humerus with olecranon fossa. AB is drawn parallel to the distal humeral joint line, so that angle BAB' marks the angle needed for correction. The dome then drawn with line AB' as its radius. After dome osteotomy is completed, distal humerus is rotated so that Band B' are in same point. Reproduced from Bauer et al.*[6]

Eamsobhana and Kaewpornsawan performed a double dome osteotomy to address both the coronal and sagittal plane deformities in cubitus varus.[21] The first dome osteotomy was at the apex of the olecranon fossa with the center if the dome aligned with the humeral midline axis. The second dome osteotomy was also at the apex of the olecranon fossa, but with the centre of the dome aligned with the midline axis of the ulna. The 2 domes overlap, creating 2 semicircular wedges for removal. After bone removal, the osteotomies are translated so the humeral axis is aligned with the ulnar axis, thus correcting the varus and extension deformities. [6, 21]

D. Computer aided multiplanar osteotomy

Multiplanar osteotomies can accurately correct not only varus deformity, but also the extension and internal rotation that are part of the cubitus varus deformity, improving both appearance and function. [22]

Rotational deformity is difficult to understand through conventional radiographs, and so accurate planning of multiplanar osteotomies require a preoperative CT scan.[6, 22] The surgeon can work with either implant company or software company to generate a 3-D model for the radius, ulna and humerus. The entire affected arm and the healthy humerus are superimposed to determine the correction of the deformity. On the basis of this model, the surgeon can create patient-specific cutting guides as well as custom surgical fixation devices. [6]

The surgical template is placed in contact with the distal humerus. K-wires are inserted into the bone to hold the guide in place. An oscillating saw is used to perform the planned osteotomies, through slits in the guide. The bone wedges removed. The K-wires on the proximal fragment as guides for rotation and translation of the distal fragment. The K-wires on the distal fragment are positioned until it aligns with the proximal wires for complete correction. Different types of fixation can be used such as K-wires, tension band wires, standard plates and screws, or custom devices. [6, 22]

Discussion:

Three recent review literatures, no single technique was found to be safer or more effective than any other.[5-7] And also indications for which technique to select are unclear, and it is even uncertain whether correction of the internal rotation deformity is necessary for a successful result.[23] Estimated overall rate of good to excellent results was 87.8% and complication rate of 14.5% have been reported in a meta-analysis, which include nerve injury, residual deformity, loss of fixation, infection and unsightly scarring.[5] Corrective osteotomy in the distal humerus for paediatric group is less technically demanding surgery when compared with adolescents and adults.[7]

Complex multiplanar osteotomy found to have lowest overall complications.[5, 6] In one review study[5], they found 9.4% of patients treated by this technique reported complications. This technique corrects accurately varus deformity, and also extension and internal rotation. But this technique has some drawbacks. The major issues are access and cost effectiveness. A bilateral CT scan with corrective software and cutting templates is required, which may not be readily available. Another issue is whether the correction of internal rotation deformity even necessary.[6] Some author suggested that excessive internal rotation may be related to the development of tardy ulnar nerve palsy, others have suggested that internal rotation correction does not affect the outcome of cubitus varus corrections.[6,23] Although multiplanar osteotomies have the potential to correct cubitus varus with fewer complications, the difficulty of obtaining custom surgical guide templates for each patient prevent this from currently becoming the gold standard.[5-7]

Lateral close wedge osteotomy is the most popular technique due to its simplicity, ease and reproducible.[6,7,24] This technique is less technically demanding and to have a decreased risk of nerve injuries compared with others.[6,7] Complications from lateral wedge osteotomies are reported between 14% and 53%.[6] The main drawback of this technique is that prominence of the lateral condyle is not addressed with this method. Loss of correction when Kirscher wires alone are used for fixation, is another complication. Oppenheim et al.[17] described other complications such as unacceptable scarring, neuropraxia, and sepsis in 24% of cases.

Step cut osteotomy was developed to address lateral condylar prominence and other complications of lateral closing wedge osteotomy.[6] But both the translational and spike-modified step-cut osteotomies have complications to consider. For the translational step-cut osteotomy, Davids et al.[25] reported a complication rate of 19%, consisting of transient nerve palsy and loss of fixation. These complications did not occur in the series of cases by Moradi et al.[18] It is more difficult to perform spike osteotomies on smaller and younger pediatric patients. Also, spike osteotomies require a larger bone resection compared with translational step-cut osteotomies and lateral closing-wedge osteotomies.[6]

With both the single and double dome osteotomies, lateral condylar prominence is less likely, while providing a large surface area for fixation and healing.[6,21] In addition, rotational deformity can be corrected.[6] High patient satisfaction with appearance has been reported.[21] However, it is more technically demanding.[19] other complications included transient radial nerve palsy, superficial infection, and excessive derotation.[21] One series found a higher rate of radial nerve palsy using the posterior triceps-sparing approach.[6] Similarly, Raney et al.[26] noted similar overall rates of complications with both lateral and posterior approaches but associated a higher rate of nerve palsies with the posterior approach.[6]

A study by Solfelt et al.[5] found although an estimated overall poor surgical outcome rate of 12.2% and a complication rate of 14.5% across all osteotomy classes is higher than is desirable, many authors pointed out that a complication does not necessarily equate to a poor functional result or decreased patient satisfaction. Patients were reported to appreciate improvements in cosmesis, even when there was some residual deformity.[5] Nerve injury found to be the most feared complication of supracondylar osteotomy, at a rate of 2.5% across all osteotomy techniques. But fortunately, patients can be counselled that most nerve injuries are transient.[5]

It has been found that most common indication for surgery was cosmetic deformity, and there was absence of functional problem prior to surgery.[5] Nevertheless, Oppenheim et al.[17] found that total pre-operative range of elbow movement in the affected limb was often less than that of the normal side. This suggest that functional limitations secondary to cubitus varus are either underreported or are unrecognised in children.

Conclusion:

There are multiple types of osteotomies exist to correct cubitus varus deformity in children, and no gold standard surgical technique has been found. Each method has its own advantage and complications. Further research requires consideration for a simple and effective surgical technique with minimal complication and maximum patient satisfaction. We recommend that surgeons performing a surgical correction of cubitus varus deformity, be aware of the potential complications and adequately counsel the patient regarding the probability of complications and choose the technique most suitable to the age and deformity of the patient.

References:

1. Smith L. Deformity following supracondylar fractures of the humerus. J Bone Jt Surg Am. 1965; 47: 1668.
2. Theruvil B, Kapoor V, Fairhart J, et al. Progressive cubitus varus due to bony physeal bar in a 4 year old girl following a supracondylar fracture. J Orthop Trauma. 2005; 19: 669-672.
3. Hayer A. Treatment of supracondylar fracture of the humerus by skeletal traction in abduction splint. J Bone Joint Surg Am. 1952; 54: 623-37.
4. Piggot J, Graham MK, McCoy GF. Supracondylar fracture of the humerus in children: Treatment by straight lateral contraction. J Bone Joint Surg. 1986; 68: 577-83.

5. Solfelt DA, Hill BW, Anderson CP, Cole PA. Supracondylar osteotomy for the treatment of cubitus varus in children- a systematic review. Bone & Joint Journal. May 2014; 96B(5): 691-700.
6. Bauer AS, Pham B, Lattanza LL. Surgical correction of cubitus varus. J Hand Surg Am. March 2016; 41: 447-52.
7. Ho CA. Cubitus Varus—It's More Than Just a Crooked Arm! J Pediatr Orthop 2017; 37: S37–S41.
8. Wilkins KE. Residuals of elbow trauma in children. Orthop Clin North Am. 1990; 21: 291–314.
9. O'Driscoll SW, Spinner RJ, McKee MD, et al. Tardy posterolateral rotatory instability of the elbow due to cubitus varus. J Bone Joint Surg Am. 2001; 83-A: 1358-69.
10. Fujioka H, Nakabayashi Y, Hirata S, et al. Analysis of tardy ulnar nerve palsy associated with cubitus varus deformity after a supracondylar fracture of the humerus: a report of four cases. J Orthop Trauma. 1995; 9: 435–440.
11. Jeon IH, Oh CW, Kyung HS, et al. Tardy ulnar nerve palsy in cubitus varus deformity associated with ulnar nerve dislocation in adults. J Shoulder Elbow Surg. 2006; 15: 474–8.
12. Abe M, Ishizu T, Shirai H, et al. Tardy ulnar nerve palsy caused by cubitus varus deformity. J Hand Surg Am. 1995; 20: 5–9.
13. Arrigoni P, Kamineni S. Uncovered posterolateral rotatory elbow instability with cubitus varus deformity correction. Orthopedics. 2009; 32: 130.
14. Seo SG, Gong HS, Lee YH, et al. Posterolateral rotatory instability of the elbow after corrective osteotomy for previously asymptomatic cubitus varus deformity. Hand Surg. 2014; 19: 163–9.
15. Devnani AS. Lateral closing wedge supracondylar osteotomy of humerus for post-traumatic cubitus varus in children. Injury. 1997; 28(9-10): 634-57.
16. French PR. Varus deformity of the elbow following supracondylar fractures of the humerus in children. Lancet 1959; 2: 439–41.
17. Oppenheim WL, Clader TJ, Smith C, Bayer M. Supracondylar humeral osteotomy for traumatic childhood cubitus varus deformity. Clin Orthop Relat Res. Sept 1984; 188: 34-9.
18. A. Moradi, E. Vahedi, M. H. Ebrahimzadeh. Spike Translation: A New Modification in Step-cut Osteotomy for Cubitus Varus Deformity. Clin Orthop Relat Res. 2013; 471: 1564–71. DOI 10.1007/s11999-012-2756-y
19. Kumar K, Sharma VK, Sharma R, Maffulli N. Correction of cubitus varus by French or dome osteotomy: a comparative study. J Trauma 2000; 49: 717–21.
20. Banerjee S. Sabui KK, Monal J, Dip SJR, Pal DK. Corrective dome osteotomy using the paratricipital (triceps-sparing) approach for cubitus varus deformity of children. J Pediatr Orthop. 2012; 32(4): 385-93.
21. Eamsobhana P, Kaewpornsawan K. Double dome osteotomy for the treatment cubitus varus in children. Int Orthop. 2013; 37(4): 641-6.
22. Takeyasu Y, Oka K, Miyake J, Kataoka T, Moritomo H, Murase T. Preoperative, computer simulation-based, three-dimensional corrective osteotomy for cubitus varus deformity with use of a custom designed surgical device. J Bone Joint Surg Am. 2013; 95(22): e173.
23. Takagi T, Takayama S, Nakamura T, et al. Supracondylar osteotomy of the humerus to correct cubitus varus: do both internal rotation and extension deformities need to be corrected? J Bone Joint Surg Am. 2010; 92(7): 1619–26.
24. Bellemore MC, Barrett IR, Middleton RWD, Scougall JS, Whiteway DW. Supracondylar osteotomy of the humerus for correction of cubitus varus. J Bone Joint Surg. Aug 1984: 66B(4); 566-72.
25. Davids JR, Lamoreaux DC, Booker RC, Tanner SL, Westerberry DE. Translation step-cut osteotomy for treatment of post traumatic cubitus varus. J Pediatr Orthop. 2011; 31(4): 353-65.
26. Raney EM, Thielen Z, Gregory S, Sobralske M. Complications of supracondylar osteotomies for cubitus varus. J Pediatr Orthop. 2012; 32(3): 232-40.

Conversion Disorder: An Interesting Case Report

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Abstract

Conversion disorder presents as a somatoform disorder where physical symptoms found as neurological causes either motor or sensory loss without any structural impairment due to psychological origin. It actually occurs functionally without any medical or physical cause. Any sense modality may be involved and reflexes remain intact. There might be associated primary and secondary gains which act as maintaining factor. Conversion disorder is two to three times more prevalent in young adult especially females. They are associated with stressors or conflicts which are perceived as unbearable. The symptoms generally reflect a means to avoid the stressors off in when solution cannot find by them. The case report presents a partial intervention involving one session.

Key words: Conversion, Depression, Primary gain, Secondary gain, Insight

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Introduction:

Conversion disorder(Functional Neurological Symptom Disorder) according to DSM-5, should have following criteria- (i) one or more symptoms of altered voluntary motor or sensory functions, (ii) clinical finding provide evidence of incompatibility between the symptoms and recognized neurological or medical condition, (iii) the symptoms or deficit is not better explained by another medical or mental disorder, (iv) the symptom or deficit causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or warrants medical evaluation.[1]

So, conversion disorder is an illness characterized by unexplained voluntary motor or sensory deficits suggesting a medical condition. A psychological factor which may be stressors or conflict is determined to be responsible for the symptoms. The symptoms are not intentionally produced, are not caused by substance use, are not limited to pain or sexual symptoms, and the gain is primarily psychological and not social, monetary or legal.[2]

Onset is in usually early adulthood, common in women in low socioeconomic less well educated and rural population who has been exposed to combat situations.[3] Course is usually episodic, lasting months to years. Psychological stressors exacerbate the disorder. Patient improves significantly in individual insight oriented psychotherapy. Psycho-pharmacotherapy helps only in a drug responsive condition like depression.[4]

Case Report:

A 25-years old graduate married lady, mother of two daughters, husband living abroad, coming from rural area admitted with complaints of headache, dizziness, nausea, weakness, body pain, anorexia, often convulsion for prolong time for the last two years. She had visited many physicians, neurologist and neurosurgeon. She had done several repeated investigations like computed tomography, magnetic resonance imaging, took medication which could not improved her condition neither reveled any neurologic or general medical condition. Then she was referred to psychiatrist and admitted into hospital. She was accompanied by her mother and aunt.

Discussion:

On history and mental state examination she had a significant past history of stressors and emotional conflicts. The significant issue is all the way she presented

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with conversion symptoms at home and to doctors but underneath she had a emotional state of stress and conflicts which may lead to depression. Once she was hurt verbally and physically by her brother in childhood and later in teen she was in love with a young person which was forcefully forbidden by her mother. She was a sensitive lady with soft spoken. She was a graduate of honors in Bangla from local college; near by a district of Dhaka. She was good at education but could not continue after marriage. Her husband worked at abroad. She had two daughters age between 8 years and 1.5 years staying with mother and father in laws along with sister in law, brother in law at nearby her parent's home. But recently she stayed alone with her two kids separately a little far away from in-laws home for her elder daughter's schooling purposes. The most striking problem was she was carried to the doctors only by her mother alone. Her father who was a farmer neither member from in-laws family accompanied her. Though she had good relationship with them according to her mother, who was the informant. After one session of individual psychotherapy reassurance done. Partially rapport established, patient started crying to communicate. But due to overprotective mother she was carried out by her aunt back to home. The informant had no insight about mental illness. They did not want to take her to psychiatrist. The dilemma was it could be a mood disorder overwhelmed by conversion disorder. As she was physically hurt on childhood, emotionally turmoil due to teenage breakage of love affair, marriage and motherhood. The prognostic value might not good as mother was not supportive and hidden her mental illness as physical. Besides her developmental history was normal. Though her mother took her discharge order with request bond, she had given an antidepressant and mood stabilizer as for hidden history of mood fluctuations .But she need psychotherapy too for further session, which was incomplete. This was the actual scenario of conversion disorder and a diagnostic dilemma too.

Conclusion:

The insight oriented psychotherapy focused on the concepts of primary and secondary gain. Secondary gain implies a significant external benefit or avoidance of unwanted responsibilities from symptom. The primary gain is the relief obtained by the conversion of the mental distress generated by a hypothesized neurotic conflict into physical symptoms, thereby allowing the conflict to remain unconscious. Secondary gains are usually prominent in the conversion disorders but are also common in other psychiatric disorders. Here this case may represents in other psychiatric disorder and secondary gain remains due to social factor where her mother playing a major role. So, for this case she should mostly focus on cognitive therapy as well as antidepressants other medication too.The goal is to increase the patient's development of insight into psychological conflicts that, if unresolved, can manifest as symptomatic behaviour.

References:

1. Diagnostic and Statistical Manual of Mental Disorder, 5th Edition: DSM-5. American Psychiatric Association, 2013.
2. Benjamin J S, Virginia AS. Kaplan & Sadock's pocket handbook of clinical psychiatry 6th edition.
3. Harrison P, Cowen P, B Tom. Shorter Oxford Textbook of Psychiatry.7th edition.Oxford press UK 2018.
4. Stonniyton C M, Barry J.J, Fisher R.S. Conversion disorder. American Journal of Psychiatry.2006;163:15-16.

Academic Activities During COVID-19 Pandemic

Journal of Green Life Med. Col. 2020; 5(2): 82

Online academic activities during Pandemic

During the COVID 19 Pandemic and Nation-wide lock down, under the guidance of The Chairman, Governing Body, National Professor Shahla Khatun, a special Online Class Committee was created in early March of 2020.

The committee worked hard and sincerely to initiate and conduct online classes and examinations and Green Life Medical College was one of the institutes which started online academic activities in the earliest time. To achieve this, the committee effortlessly worked to train the teachers, students and staffs, arrange new routines, create class moderators, buy zoom account and to communicate with the students at home and abroad. The committee also arranged several virtual meetings between faculties.

The activities of the committee continued till August, when physical classes again started to resume.

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