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From the Desk of Editor-in-Chief

We are delighted to inform that the Volume 10, Number 2 of the Dhaka Central International Medical College Journal (DCIMCJ) is going to be published very soon. We are grateful to Almighty Allah. We are sending the complimentary copies of the journal to the libraries of most of the medical college and other medical institutions in Bangladesh. Already our journal has been approved by Bangladesh Medical & Dental Council (BMDC). We invite the doctors of medical colleges and institutes to submit their research articles to the journal committee for publication. We accept both hard & soft copies of the articles. We go through the papers and if necessary, communicate the authors. We also thank all the authors for giving us opportunity to publish their research papers in this journal. We have tried our best to avoid erroneous information. We like to add here that DCIMC Journal and its editorial board accept no liability for any inaccurate and misleading information, opinion and statements. It is the responsibility of the individual author (s). We have mentioned the instruction for the authors in this issue. We request the contributing authors to follow the instructions for their manuscripts. We appreciate our chairman, editors, members and advisors for their encouragement and also appreciate the contributors and reviewers for their participation. Last of all we welcome valuable suggestion, opinion, advice and constructive criticisms for improvement of the quality of the journal.



Prof. Dr. Abul Bashar Md. Abdul Matin
Editor-in- Chief

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A manuscript number will be mailed to the corresponding author within two working days. The cover letter should include the corresponding author`s full address and telephone / fax numbers and should be in an e-mail message sent to the editor, with the file, whose name should begin with the first author`s surname attachments or triplicate Hard copy with a soft copy.

Article types:

Five types of manuscripts may be submitted:

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It will be preferably written invited only and usually covers a single topic of contemporary interest.

Original articles:

These should describe new and carefully confirmed findings, and experimental procedures should be given in sufficient detail for others to verify the work. The length of a full paper should be the minimum required to describe and interpret the work clearly.

Short communications:

A Short Communication is suitable for recording the results of complete small investigations or giving details of new models or hypotheses, innovative methods, techniques, images in clinical practice, letter to editors, short reports or apparatus. The style of main sections need not conform to that of original article. Short communication are 2 to 4 printed pages (about 6 to 12 manuscript pages) in length.

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Submissions of reviews and perspectives covering topics of current interest are welcome and encouraged. Reviews should be up to date. Reviews are also peer-reviewed.

Case reports:
This should cover uncommon and /or interesting cases with appropriate confirmation process.

Review process:
All manuscripts are initially screened by editor and sent to selective reviewer. Decisions will be made as rapidly as possible, and the journal strives to return reviewers comments to authors within 3 week. The editorial board will re-review manuscripts that are accepted pending revision. The DCIMCJ editorial board will try to publish the manuscript as early as possible fulfilling all the rigorous journal needs.

I. A. Preparing manuscript for submission to DCIMCJ Editors and reviewers spend many hours reading manuscripts that are easy to read and edit. Much of the information in this journal`s Instructions to Authors is designed to accomplish that goal in ways that meet each journal`s particular editorial needs. The following information provides guidance in preparing manuscripts for this journal.

Condition for submission of manuscripts:

- All manuscripts are subject to peer-review.
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4. Each of the following section should begin separate page:
    - Title page
    - Summary/abstract
    - Text
    - Acknowledgement
    - References
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Page should be numbered consecutively at the upper right hand corner of each page beginning from the title page

I. A. 1.a. General Principles:

- The text of observational and experimental articles is usually (but not necessarily) divided into the following section: Introduction, Methods, Results, and Discussion. This so-called “IMRAD” structure is a direct reflection of the process of scientific discovery.

- Long articles may need subheadings within some sections (especially Results and Discussion) to clarify their content. Other types of articles, such as case reports, reviews, and editorials, probably need to be formatted differently.
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- Authors need to work closely with editors in developing or using such new publication formats and should submit supplementary electronic material for peer review.
- Double-spacing all portions of the manuscript- including the title page, abstract, text, acknowledgments, references, individual tables, and legends- and generous margins make it possible for editors and reviewers to edit the textline by line and add coments and queries directly on the paper copy.
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- Authors should number on right upper corner of all of the pages of the manuscript consecutively, beginning with the title page, to facilitate the editorial process.

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Research reports frequently omit important information. Reporting guidelines have been developed for a number of study designs that DCIMC journals ask authors to follow. Authors should consult the information for Authors of this journal. The general requirements listed in the next section relate to reporting essential elements for all study designs. Authors are encouraged also to consult reporting guidelines relevant to their specific research design. A good source of reporting guidelines in the EQUATOR network (http: //www. equator-network.org/home/) or CONSORT network (http://www.consort-statement. org).

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1. Article title. Concise title is easier to read than long, convoluted ones. Titles that are too short may, however, lack important information, such as study design (which is particularly important in identifying type of trials). Authors should include all information in the title that will make electronic retrieval of the article both sensitive and specific.
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- State the specific purpose or research objective of, or hypothesis tested by, the study or observation; the research objective is often more sharply focused when stated as a question.
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- Provide only directly pertinent primary references, and do not include data or conclusions from the work being reported.

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I. A 9. References:

I. A. 9. a. General considerations related to

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- Type or print each table with double-spacing on a separate sheet of paper. Number tables consecutively in the order of their first citation in the text and supply a brief title for each.

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- Identify statistical measures of variations, such as standard deviation and standard error of the mean.

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- If a paper version of the manuscript is submitted, it should contain print copies of tables and figures; they are all needed for peer review and editing, and the editorial office stall cannot be expected to make the required copies.
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General outline for article presentation and format:

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- References cited in superscript in the text without brackets after with/without comma (,) or full stop (.)
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Language and grammar:

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  - Key words provided – arrange them in alphabetical order (three – five)
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  - Duration and place of study
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  - Patient consent
  - Statistical analysis and software used.
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  - Avoid data redundancy
  - Use table information at the end of the sentence before full stop between the small bracket
- **Discussion:**
  - Avoid unnecessary explanation of someone else work unless it is very relevant to the study
  - Provide and discuss with literatures to support the study
  - Mention about limitation of your study
- **Conclusion:**
  - Give your conclusion
  - Any recommendation
- **Acknowledgement:**
  - Acknowledge any person or institute who have helped for the study
- **Reference:**
  - Abide by the Vancouver style
  - Use reference at the end of the sentence after the full stop with superscript
- **Legends:**
  - Table
  - Figures

The editor reserves the right to style and if necessary, shorten the material accepted for publication and to determine the priority and time of publication

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DCIMCJ

Editorial

DCIMCJ 2023 July;10(2):13-16

Heat to Heat Stroke

Begum R[1], Karim S[2]

Overview:

With each summer of increased extreme heat, more people worldwide face the risks associated with heat exposure. Last year, Europe saw a record number of heat-related deaths, and even regions more used to dealing with hot weather, like South Asia, are seeing high temperatures start earlier and earlier in the season. In Bangladesh, Dhaka observed the highest maximum temperature recorded in decades of 40.6°C on 15th April 2023. In India, several northern and eastern cities recorded maximum temperatures above 44°C on 18th of April 2023. Heat is an important environmental and occupational health hazard. Heat stress is the leading cause of weather-related deaths and can exacerbate underlying illnesses including cardiovascular disease, diabetes, mental health, asthma, and can increase the risk of accidents and transmission of some infectious diseases. Heatstroke is a medical emergency with a high-case fatality rate.

Heat strokethe most dangerous form of heat-related illness—is a growing threat and creates a public health quandary since there's still no available treatment other than simply cooling victims down. Scientists have attributed the heat waves to man-made climate change. Heat waves are one of the deadliest hazards, and in line with the IPCC prediction their frequency and magnitude are rising due to man-made climate change. In 2023, summer brought on a series of unexpected heatwaves in Bangladesh, affecting people's general well-being and worsening pre-existing medical conditions to cause widespread suffering and distress throughout the country. July 2023 was the hottest July on earth in the last 120, years and the hottest July from the beginning of temperature measurement with a wide margin. During each day in July 2023, two billion people experienced heat conditions made at least three times more likely due to climate change and 6.5 billion people experienced this impact at least one day in the month. Population exposure to heat is increasing due to climate change, and this trend will continue. Globally, extreme temperature events are observed to be increasing in their frequency, duration, and magnitude. A Harvard report says nearly an average of 1500 people died between 2003 and 2007 in Bangladesh.Heatwaves are not onlyunbearable to live in, they are also extremely distressing to our health and well-being. It is important to take measures to tackle the heatwave as they can affect people's general well-being and worsen pre-existing medical conditions. The negative health impacts of heat are predictable and largely preventable with specific public health actions. WHO has issued public health guidance for the general public and medical professionals on coping with extreme heat.

Heat stroke:

Heatstroke is a life-threatening condition that causes our body to overheat. It's defined as a body temperature above 104 degrees Fahrenheit (40 degrees Celsius). Heatstroke, also called sunstroke, is the most severe form of hyperthermia or heat-related illness. Heatstroke can lead to brain damage, organ failure or death.

1. Dr. Rahana Begum, Associate Professor, Department of Community Medicine, Dhaka Central International Medical College.

2. Dr. Shajedul Karim, Registrar, Department of Medicine, Universal Medical College.

There are two types of heatstroke

Exertional heatstroke:

This form of heatstroke is usually the result of physical overexertion in hot, humid conditions. It can develop in a few hours.

Non-exertional heatstroke:

Also called classic heatstroke, this type can occur due to age orunderlying health conditions. It tends to develop over several days.

Who is affected?

Rising global ambient temperatures affect all populations. Anyone can get heatstroke. However, some populations are more exposed to, or more physiologically or socio-economically vulnerable to physiological stress, exacerbated illness, and an increased risk of death from exposure to excess heat. These include the elderly, infants and children, pregnant women, outdoor and manual workers, athletes, and the poor. Gender can play an important role in determining heat exposure

Other Factors that increase risk of heatstroke include:

- Drinking alcohol.
- Being male.
- Being dehydrated.
- Drugs that affect your body's ability to regulate temperature, such as diuretics, sedatives, tranquilizers, or heart and blood pressure medications.
- Having certain diseases that affect your ability to sweat, such as cystic fibrosis.
- Having certain medical conditions, such as a sleep disorder or problems with your heart, lungs, kidneys, liver, thyroid or blood vessels.
- Wearing heavy or tight clothing, such as protective gear.
- Having a high fever.
- Having obesity.
- A past history of heatstroke.
- Poor physical conditioning or not being used to hot conditions.

How does heat impact health?

Heat gain in the human body can be caused by a combination of external heat from the environment and internal body heat generated from metabolic processes. Rapid rises in heat gain due to exposure to hotter than average conditions compromise the body's ability to regulate temperature and can result in a cascade of illnesses, including heat cramps, heat exhaustion, heatstroke, and hyperthermia. Deaths and hospitalizations from heat can occur extremely rapidly (same day), or have a lagged effect (several days later) and result in accelerating death or illness in the already frail, particularly observed in the first days of heatwaves. Even small differences from seasonal average temperatures are associated with increased illness and death. Temperature extremes can also worsen chronic conditions, including cardiovascular, respiratory, and cerebrovascular disease and diabetes-related conditions. Heat also has important indirect health effects. Heat conditions can alter human behavior, the transmission of diseases, health service delivery, air quality, and critical social infrastructure such as energy, transport, and water. The scale and nature of the health impacts of heat depend on the timing, intensity and duration of a temperature event, the level of acclimatization, and the adaptability of the local population, infrastructure and institutions to the prevailing climate. The precise threshold at which temperature represents a hazardous condition varies by region, other factors such as humidity and wind, local levels of human acclimatization and preparedness for heat conditions.

Signs and symptoms of heatstroke:

Anhidrosis (dry skin that doesn't sweat, which is more common in non-exertional heatstroke), Ataxia (problems with movement and coordination), problems, Delirium (confusion or disorientation), Dizziness , Excessive sweating that continues after you've stopped exercising (more common in exertional heatstroke), Hot, flushed skin or very pale skin, Low pressure, Lung crackles (bubbling or gurgling sound in the lungs),Nausea and vomiting, Oliguria (low urine output), Rapid breathing or tachycardia (fast heart rate), Seizures, Syncope (fainting) or loss of consciousness, Weakness.

Complications of heatstroke:

People with heatstroke can develop shock or slip into a coma. High body temperature can lead to: Acute respiratory distress syndrome (ARDS), Brain swelling, Renal failure, Liver failure, Metabolic dysfunction, Nerve damage, Reduced blood flow to the heart and other circulatory problems.

Prevention:

When the heat index is high, it's best to stay in an air-conditioned environment.

Keep the body cool and hydrated:

- Take cool showers or baths. Alternatives include cold packs and wraps, towels, sponging, foot baths, etc.
- Wear light, loose-fitting clothes of natural materials. If you go outside, wear a wide-brimmed hat or cap and sunglasses.
- Use light bed linen and sheets, and no cushions, to avoid heat accumulation.
- Drink regularly, but avoid alcohol and too much caffeine and sugar.
- Eat small meals and eat more often. Avoid foods that are high in protein

Pratection during heatwave:

- Move to the coolest room in the home, especially at night.
- If it is not possible to keep home cool, spend 2-3 hours of the day in a cool place.
- Avoid going outside during the hottest time of the day.
- Avoid strenuous physical activity if you can. If you must do strenuous activity, do it during the coolest part of the day, which is usually in the morning between 04:00 and 07:00.
- Stay in the shade.
- Do not leave children or animals in parked vehicles.

If anyone have health problems:

1. Keep medicines below 25 °C or in the refrigerator (read the storage instructions on the packaging).
2. Seek medical advice if suffering from a chronic medical condition or taking multiple medications.

If feel unwell:

- Try to get help if feel dizzy, weak, anxious or have intense thirst and headache; move to a cool place as soon as possible and measure body temperature.
- Drink some water or fruit juice to rehydrate.
- Rest immediately in a cool place if have painful muscular spasms (particularly in the legs, arms or abdomen, in many cases after sustained exercise during very hot weather), and drink oral rehydration solutions containing electrolytes. Medical attention is needed if heat cramps last more than one hour.
- Consult doctor if feel unusual symptoms or if symptoms persist. While waiting for help, move the person to a cool place, put him or her in a horizontal position and elevate legs and hips, remove clothing and initiate external cooling, for example, by placing cold packs on the neck, axillae and groin, fanning continuously and spraying the skin with water at 25–30 °C. Measure the body temperature. Do not give acetylsalicylic acid or paracetamol. Position an unconscious person on his or her side.

Conclusion:

Heatwaves can burden health and emergency services and also increase strain on water, energy and transportation resulting in power shortages or even blackouts. Food and livelihood security may also be strained if people lose their crops or livestock due to extreme heat. Awareness remains insufficient of the health risks posed by heatwaves and prolonged exposure to increased temperatures.

The increased mortality rate is likely due to the higher prevalence of comorbidities and older age in the classic population. If immediate rapid cooling is successful, there has been a zero-fatality rate for young exertional heat-stroke patients.

WHO works with the health sector to strengthen governance, preparedness and response to acute impacts of heatwaves by developing heat action plans, heat early warning systems and advisories, and emergency response plans that map the risks, vulnerable populations, available capacities and resources. These plans protect high risk populations such as those in health facilities, nursing homes and schools have access to cooling.Health professionals should adjust their guidance, planning and interventions to account for increasing heat exposures, as well as to manage acute increases in admissions associated with heatwaves. Practical, feasible and often low-cost interventions at the individual, community, organizational, governmental and societal levels can save lives.

References:

1. https://www.ncbi.nlm.nih.gov/books/NBK537135/
2. https://www.who.int › Newsroom › Fact sheets › Detail 1 June 2018
3. Lancet Countdown: Heat-related Mortality. 2023. https://www.lancetcountdown.org/data-platform/health-hazards-exposures-and-impacts/1-1-health-and-heat/1-1-5-heat-and-sentiment.
4. Zhao, Q, Guo Y, Ye T, Gasparrini A, Tong S, Overcenco A, et al. Global, regional, and national burden of mortality associated with non-optimal ambient temperatures from 2000 to 2019: a three-stage modelling study. Lancet Planet Health. 2021;5(7):e415e425.
5. https:// pubmed. ncbi. nlm.nih. gov/34245712/ Heat- related mortality in Europe during the summer of 2022.
6. https://www.nature. com/articles/s41591-023-02419-z Hot weather and heat extremes: health risks.
7. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01208-3/fulltext
8. https://pubmed.ncbi.nlm.nih.gov/34245712/
9. https://www.who.int/ news-room/ fact-sheets/ detail / climate-change-heat-and-health
10. https://www.who.int › heat › waves World Health Organization 26 July 2019
11. https://time.com/6294155/heat-stroke-risks/
12. https://www.worldweatherattribution.org/extreme-humid-heat-in-south-asia-in- april-2023 largely- driven-by-climate- change- detrimental-to vulnerable -and-disadvantaged-communities/
13. https:// www. climateimpactstracker. com/ heat-wave-in-bangladesh-record-setting-temperatures/
14. https://jintensivecare.biomedcentral.com/articles/10.1186/s40560-018-0298-4
15. https://www.mayoclinic.org/diseases-conditions/heat-stroke/symptoms-causes/syc-20353581
16. https://jintensivecare.biomedcentral.com › articles

DCIMCJ

Original Article

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Colonization Pressure: A Potential Risk Factor for Multidrug Resistant Bacteria Obtained in Intensive Care Unit

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Abstract:

Introduction: Multidrug-resistant bacteria (MDR) are linked to a significant percentage of ICU acquired illnesses. These bacteria can cause infections that lead to higher death rates, longer hospital stays on mechanical ventilation, and lengthier stays in intensive care units. Objective: The main goal of the study was to assess how colonization pressure affected multidrug resistant bacteria (MDRB) that were acquired by the intensive care unit (ICU). Methods: From June 2020 to June 2021, admitted patients hospitalized for more than 48 h in the ICU were included in this prospective observational study. MDRB were defined as methicillin resistant Staphylococcus aureus, Pseudomonas aeruginosa resistant to ceftazidime or imipenem, Gram-negative bacilli producing extended-spectrum beta-lactamases (ESBL), and all strains of Acinetobacter baumannii. Colonization pressure was daily calculated in the three participating ICUs. Univariate and multivariate analyses were used to determine risk factors for ICU acquired MDRB. One hundred and two (34%) of the 297 included patients acquired an MDRB during their ICU stay. Results: Multivariate analysis identified colonization pressure as an independent risk factor for ICU acquired MDRB (OR (95% CI) 4.18 (1.03–17.01), p = 0.046). Other independent risk factors for ICU acquired MDRB were mechanical ventilation (3.08 (1.28– 7.38), p = 0.012), and central venous catheter use (OR, 3.04 (1.38–6.68), p = 0.006). Conclusion: MDRB acquired in the ICU were linked to longer ICU stays, longer mechanical ventilation times, and higher fatality rates. On the other hand, there was no significant correlation seen between ICU acquired MDRB and ICU mortality. One independent risk factor for MDRB acquisition in the ICU is colonization pressure.

Keywords: ICU- Intensive care unit, MDRB- multidrug resistant bacteria, MRSA -methicillin resistant staphylococcus aureus.

Introduction:

Multidrug resistant bacteria (MDRB) are common in critically ill patients, and are frequently reported to be responsible for ICU acquired infections. According to the multinational study EUROBACT, 48% of hospital- acquired bacteremia episodes were caused by MDRB[1]. A more recent large Multinational observational study, MDRB were shown to be the causal pathogens in 61% of patients with ventilator-associated pneumonia (VAP) or ventilator associated tracheobronchitis[2]. Infections related to MDRB are associated with higher mortality rates, longer duration of mechanical ventilation, and ICU stay[3]. Drug toxicity, eventual resistance, and improper initial antibiotic treatment are some possible reasons for the increased death rate among patients with illnesses linked to MDRB. The main risk factors for resistance are prior exposure to antibiotics, prolonged ICU length of stay, invasive devices, comorbidities and local epidemiology[4].

Finding the risk factors for ICU acquired MDRB may help to enhance patient outcomes and preventive measures for critically ill patients.

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It hasbeen observed that colonization pressure, which is the ratio of patients colonized with MDRB to all patients, is a risk factor for methicillin resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococcus (VRE), and Clostridium difficile that are acquired in intensive care units[5]. Acinetobacter baumannii and Pseudomonas aeruginosa[6,7]. However, none of these studies evaluated the impact of colonization pressure related to all MDRB on the risk for acquiring these bacteria in the ICU. Therefore, we hypothesized that higher colonization pressure related to MDRB would be associated with increased risk for ICU acquired MDRB.

The primary aim of this prospective observational study is to determine if colonization pressure for all MDRB is a risk factor for ICU-acquired colonization or infection related to MDRB.

Material and methods:

Study design:

This prospective observational study was performed during a 13-month period (fromJune 2018 to June 2019), in three 10-bed medical and surgical ICUs at Dhaka Central International Medical College and Hospital.

Study Population:

All adult patients admitted to the ICU for >48 h were included. Exclusion criteria were length of stay ≤ 48 h, age less than 18 years, and ICU readmission. Infection control policy included hospitalization in single bed rooms, adequate hand hygiene, achieved by using an alcohol-based hand rub formulation before and after each patient contact, routine screening for MDRB, written antibiotic treatment protocols, continuous surveillance of nosocomial infections and adequate cleaning of ICU rooms.

Routine screening for MDRB was performed for all patients at ICU admission and weekly thereafter. This screening included nasal swabs. In addition, tracheal aspirates were performed in intubated ortracheostomized patients. Microbiological cultures of other specimens were performed according to clinical status.

Preventive isolation techniques were applied in all immunosuppressed patients, during the whole ICU stay. These techniques included protective gowns, gloves, and mask usage.

Statistical analysis:

SPSS 11.5 software (SPSS, Chicago, IL, USA) was used for data analysis. Distribution of quantitative variables was tested. Normally distributed and skewed quantitative variables are presented as mean ±SD, and median (interquartile range), respectively. Results of qualitative variables are presented as numbers (percentage). All p values are two-tailed. The statistical significance was set at $p < 0.05$.

Univariate analysis was used to determine variables associated with acquisition of MDRB during ICU stay. Categorical variables were compared using Pearson chisquare, or Fischer exact test. Quantitative variables were compared using Student's t-test or Mann–Whitney U test, as appropriate. Exposure to all risk factors for MDRB was taken into account until the last acquisition of MDRB, or ICU discharge, whichever happened first. Multivariate analysis was used to determine variables independently associated with acquisition of MDRB. All predictors showing an association at $p < 0.1$ with infection or colonization caused by MDRB in univariate analysis were included in the multivariate logistic regression analysis. Potential interactions were tested, and goodness of fit was assessed by the Hosmer-Lemeshow test. Cox proportional hazards univariate and multivariate models were also used to determine risk factors for ICU-acquired MDRB. To determine the impact of ICU acquired MDRB on outcome, duration of mechanical ventilation, ICU length of stay, and ICU mortality were compared between patients with MDRB, and patients with no MDRB. Risk factors for ICU mortality were determined using univariate analysis. All predictors showing an association at $p < 0.1$ with ICU mortality in univariate analysis were included in the multivariate logistic regression analysis. Potential interactions were tested, and goodness of fit was assessed by the Hosmer-Lemeshow test.

Results:

Two hundred ninety-seven consecutive patients were included during the study period, of which 204 (34%) acquired MDRB (colonization and/or infection) during their ICU stay. The most common MDRB were P.aeruginosa (38%), A. baumannii (22%), ESBL-GNB (18%), MRSA (15%), and S. maltophilia (7%). ICU acquired infection related to MDRB occurred in 56 patients (19%). VAP and ICU acquired bacteremia were the most common ICU-acquired infections related to MDRB. Prior colonization related to MDRB was significantlyhigher in patients with ICU acquired infections related to MDRB compared with those who had infections related to other bacteria (43 of 56 (77%) versus 22 of 54 (41%), p < 0.001, OR (95% CI) 5 (2.8-9)). No outbreak occurred during the study period, but only endemic transmission of MDRB. No significant difference was found in rate of ICU acquired MDRB between the three study ICUs (45 of 113 (39%), 32 of 91 (35%), and 36 of 93 (39%), p = 0.58). Patient characteristics are presented in Tables 1 and 2.

Table -1: Patient characteristics at ICU admission

	ICU- acquired MDRB		
Variables	**Yes, N = 102**	**No, N = 195**	**p-value**
Age, years	30 (25,36)	28 (21,35)	0.005
Male gender	72 (35)	130 (33)	0.514
Transfer from other wards	72 (35)	110 (28)	0.001
Hospital length of stay before ICU	0 (0,1)	0 (0,1)	0.095
Prior antibiotic treatment	53 (26)	78 (20)	0.006
Admission category			0.001
Medical	65 (33)	147 (39)	
Surgical	38 (19)	47 (12)	
Chronic disease			
Diabetes	20 (10)	35 (10)	0.944
COPD	30 (15)	51 (14)	0.639
Chronic kidney injury	13 (6)	30 (8)	0.400
Congestive heart disease	25 (13)	38 (10)	0.221
Cirrhosis	4 (2)	5 (2)	0.595
Infection	75 (37)	108 (28)	<0.001
MDRB at admission	16 (8)	21 (5)	0.065

During ICU stay, colonization pressure, use and duration of intravascular and urinary catheters, sedation, mechanical ventilation, and ICU length of stay were identified as risk factors for MDRB by univariate analysis (Table 2).

Table 2: Patient characteristics during ICU stay:

Variables	ICU-acquired MDRB			
	Yes, N = 102	No, N = 195	p-value	OR [95% CI]
Colonization pressure, %	23 (20–27)	21 (17–26)	<0.001	
Occupation rate, %	49 (47–49)	48 (47–50)	0.330	
Central venous catheter use				
Yes	96 (47)	140 (36)	<0.001	5.79 [3.16–10.59]
Duration, days	6 (4–12)	4 (0–8)	<0.001	
Tracheotomy	16 (8)	22 (6)	0.122	1.51 [0.93–2.46]
Antibiotic treatment				
Yes	99 (49)	157 (41)	<0.001	9.50 [3.77–23.91]
Duration,	5 (3–9)	3 (1–6)	<0.001	
Mechanical ventilation use				
Yes	90 (47)	141 (36)	<0.001	5.64 [3.08–10.33]
Duration until last MDRB or discharge, days	6 (3–11)	5 (0–5)	<0.001	
Total duration, days	10 (7–19)	5 (0–5)	<0.001	
Length of ICU stay until discharge,	7 (4–12)	5 (3–8)	<0.001last MDRB or	

Percentage of days with antimicrobials, including pipercillin-tazobactm, fourth generation cephalosporins, carbapenem, fluoroquinolones, aminoglycoside, and glycopeptides was significantly higher in patients with ICU acquired MDRB, compared with those with no MDRB (Table 3).

Table 3: Exposure to antimicrobials during ICU stay

	ICU-acquired MDRB		
Percentage of days in the ICU	Yes, N = 102	No, N = 195	p- value
Antibiotics	44 (25-36)	37 (20-50)	0.001
	39 ± 14	33 ± 19	
Penicillin	0 (0–0)	0 (0–0)	0.749
	2 ± 7	2 ± 7	
Amoxicillin – clavulanic acid	0 (0–15)	0 (0–24)	0.208
	10 ± 17	12 ± 18	
Piperacillin-tazobactam	3 (0–29)	0 (0–15)	<0.001
	10 ± 17	10 ± 17	
Third generation cephalosporins	0 (0–0)	0 (0–0)	0.488
	5 ± 12	5 ± 12	
Fourth generation cephalosporins	0 (0–0)	0 (0–0)	0.039
	2 ± 7	2 ±8	
Carbapenems	0 (0–4)	0 (0–0)	<0.001
	6 ± 12	2 ± 9	
Fluoroquinolones	0 (0–19)	0 (0–10)	<0.001
	12 ± 16	9 ± 16	
Aminoglycosides	0 (0–12)	0 (0–6)	0.002
	8 ± 13	6 ± 12	
Macrolides	0 (0–0)	0 (0–0)	0.093
	1 ± 4	2 ± 4	

Colonization pressure, need for mechanical ventilation and the presence of an arterial catheter were independently associated with ICU acquired MDRB (Table 4).

Table- 4: Risk factors for ICU-acquired MDRB by multivariate analysis.

Variables	p-value	OR [95% CI]
Colonization pressure	0.046	4.18 [1.08–17.01]
Mechanical ventilation	0.012	3.08 [1.28–7.38]
Central Venous catheter	0.006	3.04 [1.38–6.68]

Colonization pressure was also identified as a risk factor for ICU-acquired MDRB by univariate and multivariate Cox proportional hazards models.

Total duration of mechanical ventilation, length of ICU stay, and ICU mortality rate were significantly higher in patients with ICU acquired MDRB, compared with those with no ICU acquired MDRB (Table 2).

Discussion:

According to our findings, colonization pressure and ICU acquired MDRB are independently related. Two additional independent risk factors for ICU acquired MDRB were found to include the use of arterial catheters and mechanical ventilation. Additionally, the length of stay in the ICU, the duration of mechanical ventilation, and the mortality rate were all linked to the development of MDRB.

However, ICU acquired MDRB was not independently associated with ICU mortality. The strengths of our study are the large number of included patients, the daily calculation of colonization pressure in all participating units and patients. Many previous studies identified colonization pressure as an independent risk factor for specific MDRB. However, none of these studies evaluated the relationship between colonization pressure and all ICU acquired MDRB.

In the past, colonization pressure was found to be a separate risk factor for the acquisition of VRE in both a personalized and non-individualized medical intensive care unit[8]. Many studies have shown MRSA-related colonization pressure to be independently associated with MRSA acquisition, not only in the ICU setting but also in medicine wards[9]. As far as Gram-negative bacilli in ICU are concerned, two recent studies established colonization pressure as a risk factor for carbapenem-resistant A. baumannii and multiresistant P. aeruginosa[6,7].

The present study clearly argues for a systematic screening of MDRB among ICU patients, thus isolation contact measures could be performed in these patients to stop the spread of MDRB. Recent studies reported conflicting results regarding the efficiency of contact isolation measures[10]. However, recent recommendations clearly encourage physicians to isolate patients with MDRB[11].

Use of central venous catheters and mechanical ventilation have been found to be independent risk factors for MDRB acquired in the intensive care unit. Moreover, there is a strong correlation between MDRB acquired in the intensive care unit and poor results. These outcomes align with previous reports[12].

Conclusion:

Colonization pressure and MDRB acquired in the ICU are independently correlated. Our findings imply that improving preventative measures in ICUs with high colonization pressure and cohorting personnel or critically sick patients with MDRB may be helpful in reducing cross-transmission of MDRB. To validate our results, larger interventional multicenter trials are needed.

References:

1. Tabah A, Koulenti D, Laupland K, Misset B, Valles J, Bruzzi De Carvalho F, et al. Characteristics and determinants of outcome of hospital-acquired bloodstream infections in intensive care units: The EUROBACT International Cohort Study. Intensive Care Medicine. 2012;38(12):1930–1945.

2. Martin-Loeches I, Póvoa P, Rodríguez A, Curcio D, Suarez D, Mira JP, et al. Incidence and prognosis of ventilator-associated tracheobronchitis (TAVeM): A multicentre, prospective, observational study. The Lancet Respiratory Medicine. 2015 3(11):859–868.

3. Bassetti M, De Waele JJ, Eggimann P. Garnacho-Montero J, Kahlmeter G, Menichetti F, et al. Preventive and therapeutic strategies in critically ill patients with highly resistant bacteria. Intensive Care Medicine. 2015; 41(5): 776–795.

4. Garnacho-Montero J, Dimopoulos G, Poulakou G, Akova M, Cisneros JM, De Waele J, et al. Task force on management and prevention of Acinetobacter baumannii infections in the ICU. Intensive Care Medicine. 2015 41(12):2057–2075.

5. Lawrence SJ, Puzniak LA, Shadel BN, Gillespie KN, Kollef MH, Mundy LM. Clostridium difficile in the Intensive Care Unit: Epidemiology, Costs, and Colonization Pressure. Infection Control & Hospital Epidemiology. 2007; 28(2):123–130.

6. Arvaniti K, Lathyris D, Ruimy R, Haidich AB, Koulourida V, Nikolaidis P, et al. The importance of colonization pressure in multiresistant Acinetobacter baumannii acquisition in a Greek intensive care unit. Critical Care. 2012; 16(3):1–11.

7. Cobos-Trigueros N, Solé M, Castro P, Torres LJ, Hernández C, Rinaudo M, et al. Acquisition of Pseudomonas aeruginosa and its resistance phenotypes in critically ill medical patients: Role of colonization pressure and antibiotic exposure. Critical Care. 2015; 19(1):8-16.

8. Drees M, Snydman DR, Schmid CH, Barefoot L, Hansjosten K, Vue PM, et al. Prior environmental contamination increases the risk of acquisition of vancomycinresistant enterococci. Clinical Infectious Diseases. 2008; 46(5):678–685.

9. Bloemendaal ALA, Fluit AC, Jansen WMT, Vriens MR, Ferry T, Argaud L, et al. Acquisition and Cross-Transmission of Staphylococcus aureus in European Intensive Care Units. Infection Control & Hospital Epidemiology. 2009; 30(2):117–124.

10. Cohen CC, Cohen B, Shang J. Effectiveness of contact precautions against multidrug-resistant organism transmission in acute care: A systematic review of the literature. Journal of Hospital Infection. 2015; 90(4):275–284.

11. Tacconelli E, Cataldo MA, Dancer SJ, De Angelis G, Falcone M, Frank U, et al. ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients. Clinical Microbiology and Infection.2014;Jan:20 Suppl 1:1-55

12. Mantzarlis K, Makris D, Manoulakas E, Karvouniaris M, Zakynthinos E.Risk factors for the first episode of Klebsiella pneumoniae resistant to carbapenems infection in critically ill patients: a prospective study. Biomed research international, 2013:850547.

DCIMCJ

Original Article

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Pattern of Alleged Rape Victims in Bangladesh: A Retrospective Study in Shaheed Shorawardy Medical College (ShSMC)

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Abstract:

Background: Rape is violation of privacy of a woman with violence, or it may be considered 'as the ravishment of a woman without her consent, by force, fear or fraud. Sexual violence has a great impact not only on physical, but also on mental health with an increased range of sexual and reproductive health problem. Objectives: The objective of the study was to understand various socio-demographic profiles, location of victim's residence, victim's signs of struggle/violence, characteristics and pattern of alleged rape victims in Bangladesh. Methods and Materials: A descriptive type of cross-sectional study was taken from a retrospective record review which was performed in the Department of Forensic Medicine and Toxicology at Shaheed Shorawardy Medical College, Dhaka from data were collected from 812 cases. Report forms of alleged rape victims of nine thanas were enrolled.Result: A total of 812 cases were recorded. Among the study the majority (59.98%) of alleged rape cases were in the group of 11-20 years followed by 21-30 years of age groups (20.07%) subjects. More than (65.02%) of the assailants were known to the victims and most of the incidents (70.07%) occurred in the victim's houses or nearby places. Minimum numbers of victim report (15.02%) within 24 hours for medical examination. Almost one fourth of the alleged rape cases were gang rape and no positive findings in favour of forceful sexual intercourse in about 72.4% of cases.Conclusion: Alleged rape was occurred under the age of 20 years and two third of the assailants were known to her, Incidence mostly occurred in the victim's own house or nearby places.

Keywords: Victim, assailant, rape

Introduction:

Rape is generally defined as unlawful sexual intercourse by a man with any woman against her will, without her consent, or with her consent when it has been obtained by unlawful means, e.g. fraud, putting her in fear of death or hurt, drugging, or impersonation[1]. The crux of the offence of rape is the sexual intercourse against the will and without the consent of a woman. If one keeps in mind the horrendous impact that an actual attack of rape has on the victim, and similarly the tremendous harm that has inflicted upon a falsely accused individual, one cannot deny the importance of applying scientific principles in the handling of a rape case. A trial of rape cannot be based upon emotional reactions of any party. The term Rape is sometimes used interchangeably with the term sexual assault. According to 'Ain O Salish Kendra (ASK)' total 936 incidents of rape or attempt to rape, 158 was documented between Januarys to December 2022 in Bangladesh[2]. Among these 47 victims died after rape and 07 other committed suicide[2]. Many women never report the rapes.

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In the rape victim or her family members remain silent or hide the incident because of social stigma, lack of support services, threat from assailant or his family, lack of protection of victim, protracted court proceedings, inadequate police investigations, lacunae in the law, particularly the absence of rape shield provisions are the reason of willingness[3]. Under section 375 of Bangladesh Penal Code, rape is defined as unlawful sexual intercourse by a man with his wife under the age of 15 years, with any other woman under the age of 18 years, or above that age, against her will, without her consent, or with her consent when it has been obtained by unlawful means. The unlawful means are: (a) putting her or any other person in whom she is interested in fear of death or hurt (b) impersonation, that is, when the man knows that he is not her husband and the consent has been given because she believes that he is another man to whom she is or believes herself to be lawfully married, and (c) with her consent when, at the time of giving such consent, by reason of unsoundness of mind or intoxication or the administration by him personally or through another of any stupefying agent or unwholesome substance, she is unable to understand the nature and consequences of that to which she consents[4]. No age is safe from rape, as children of one or less and old woman of 85 years have been reported. According to 'Ain O Salish Kendra (ASK)' In 2022 (January to December) a total number of 936 females were raped, among them 309 below the age of 18 and 227 were victims of gang rape, of them case filed 659 and no information on case filing 277, attempt of rape case was 158, of them case filed 85 and no information on case filing 73[2]. Therefore this present study was undertaken to determine the pattern of alleged rape cases in a rural area of Bangladesh which might give a picture representing rural scenario with the ultimate aim.

Methodology:

A descriptive type of cross-sectional study was taken from a retrospective record review which was performed in the Department of Forensic Medicine & Toxicology, at Shaheed Shorawardy Medical College, Dhaka, from December 2021 to November 2023. During this 2 years period, data were collected from 812 cases. Report forms of alleged rape victims of nine thanas were enrolled. The relevant copies collected from the department with the verbal consent of the reporting doctors. Data were compiled and presented by a descriptive frequency and percentage in figures and tables.

Result:

A total of 812 alleged rape victims' reports from twenty three thanas were enrolled. In the study majority of victims were unmarried (75.13%) followed by divorce and married which were (19.95%) and (04.92%) respectively (Table 1). The age of the alleged victims ranges from 5years child to 40 years old woman with the SD age of14±3 years. The majority (59.98%) of alleged rape cases was in the group of 11-20 years followed by 21-30 years of age groups (20.07%), 31-40 years (9.98%) and below the age of 10 years (9.97%) (Table 2). More than two thirds (65.02%) of the assailants were known to victims. A large number of relatives (30.05%) were responsible for occurrence (Table 3). The place of incidence of offences was highest in the victim's houses and nearby fields (70.07%) and rape also occurred in relative houses which was (20.07%) (Table 4). Majority (84.98%) of alleged rape cases were reported for medical examination after 24 hours. The time interval of medical examination was performed within 3 days (45.07%) and more than 3 days' interval is (39.91%) (Table 5). Number of assailant was single in 593 out of 812 (73.03%) and more than single 219 (26. 97%) (Table 6). Opinion was negative 593 (73.02%) out of 812 and opinion was positive 219 (26.98%) (Table 7).

Table-1: Distribution of study population according to Marital Status (n=812)

Variables	Frequency	Percentage
Unmarried	610	75.13
Married	40	04.92
Divorce	162	19.95
Total	812	100.0

Table 1: It shows that majority of the victims were unmarried 610 (75.13%)

Table-2: Age wise distribution (n=812)

Age group (Years)	Frequency	Percentage
0-10	81	9.97
11-20	487	59.98
21-30	163	20.07
31-40	81	9.98
n= 812	812	100

Table 2: It shows that most vulnerable age group was 11-20 years with total cases 487 (59.98%).

Table-3: Pattern of Assailants (n=812)

Known	Frequency	Percentage
Acquaintance	528	65.02
Neighbors	55	6.77
Relatives	244	30.05
Friends	81	9.98
Unknown		
Strangers	230	28.33
Others	60	07.39

Table- 3: Pattern of assailants, was Acquaintance 528 (65.02%).

Table-4: Place of Occurrence (n=812)

Socio-economic status	Frequency	Percentage
Victims houses & nearby places	569	70.07
Relative houses	163	20.07
Other Places	80	9.86
Total	812	100

Table -4: It shows that incidence occur mostly in victim's houses and nearby places.

Table-5: Time interval for medical examination:

Time Interval	Frequency	Percentage
Within 24 hours	122	15.02
Within 3 days	366	45.07
More than 3 days	324	39.91
n=	812	100

Table 5: It shows that victim come for medical examination within 24 hours was 122 (15.02%)

Table-6: **Number of Assailants**

Number of Assailants	Frequency	Distribution
Single	593	73.03%
More than one	219	26.97%
n=	812	100

Table -6: It shows number of assailants were single 593 (73.03%).

Table-7: Opinion of the victims

Opinion	Frequency	Distribution
Negative	593	73.02%
Positive	219	26.98%
n=	812	100

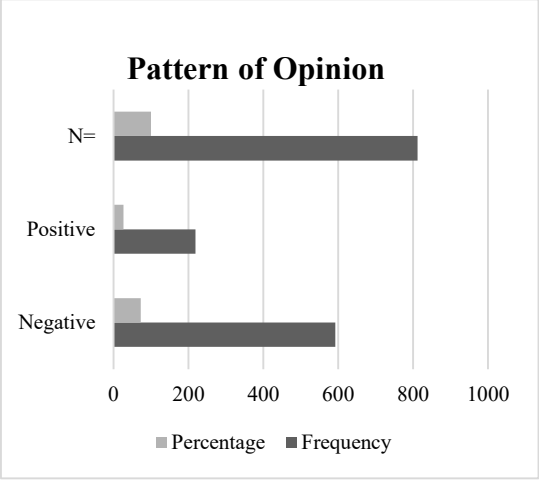


Table -7: It shows that opinion was negative in 593 (73.02%)

Discussion:

Rape is a natural sexual offence which increases day by day in Bangladesh. It often reflects socioeconomic condition and public health problems of a country. It is usually seen that rape is mostly committed in lone place, dark streets or fields were victim's screams were unheard or create a barrier where helping for sound was obstructed. It also seen in victim's own house in where victims remain alone. Now a days it also occurs in public places and even in government institutions. Non co-operation of police is one of the main reasons behind the lack of prosecution for rape. Sometime victim and her family member are both threaten by police and accused and in some cases victims and her family members were harassed by the police at the police station. In police station victim often face reluctance to file cases, victim blaming and bizarre attitude of police to arrest accused one. Often victim and her family members were pressurized by police or accused for withdrawal of the case[5]. Minimal access to legal aid, medical care, safe shelter, witness protection or psychological and social counseling was sometime unavailable. Compared to five years ago, average increase of 350 cases per month filed under the women and children repression prevention act. In 2022 violence against women was 9764 (Rape-4360, murder after rape 450 and gang rape-240). In 'Global Gender Gap Report 2022" on gender discrimination stated that Bangladesh stood 71 out of 146 countries, where in 2018 Bangladesh's position was 48th. Although trials of women and child repression cases supposed to end at the tribunals within 6 months or 180 days but it seldom happens. It takes time to collect medical certificates and DNA reports (compulsory in sexual assault cases) during case investigation. Years go in recording statements of physicians, investigating officers and different witnesses involved in the case, once trial process started. In our study majority (84.98%) of alleged rape cases were reported for medical examination after 24 hours. The time interval of medical examination was performed within 3 days (45.07%) and more than 3 days' interval is (39.91%). This delayed pattern similar with SAFE project Research[6]. It may be due to lack of awareness or distance of thanas from the place of occurrence or may be remote areas of Bangladesh where transport facility was inadequate. The study showed, opinions were negative 593 (73.02%) out of 812 and opinion was positive 219 (26.98%). Absence of spermatozoa in genital tract may be absent due to - A) Local cause like use of barrier method, vasectomy, use of withdrawal method, washing out of genital area by the victim and delayed examination of the victim B) General cause like azoospermia. Medical evidence of rape include 1) Marks of general violence on the body of the victim and the accused. 2) Marks of violence at or around the genitalia of the victim. 3) Presence of stains of semen or blood on clothing's on the body of the accused or the victim. 4) Presence of semen on the vagina. 5) Evidence of gonorrhea or syphilis or any other sexually transmitted disease on both accused and victim[7]. Therefore negative evidence does not exclude rape but on the other hand positive evidence does not confirm rape. In October 2020 Bangladesh's cabinet approved an increase in the maximum punishment in rape cases to death from life imprisonment after a series of sexual assaults triggered protests on streets and social media and president also signed an ordinance approving the death penalty for rapist[8]. If any woman or child dies as a result of raping, the offender would be punished with death or imprisonment for life with financial penalty of 100,000 taka. The death of a women and child as a result of gang rape also punishable with death or life time imprisonment with financial penalty of 100,000 taka. Rape in police custody also punishable by law maximum 10 year's imprisonment and minimum 5 years imprisonment with financial penalty[9]. If the existing law is applied properly with investigating officials working properly, independently and honesty without any political interference rape cases can be controlled[10]. During the long judicial steps most of the victims lose their interest to run the cases (for social harassment) and try to negotiate to the assailant or his family[11].

Limitations:

The findings which we revealed might not be fully representative in contrast to comprehensive scenario of rape in rural Bangladesh because the study place and sample were selected by our own choice and study done from record books supplied by the department of Forensic Medicine and Toxicology, Shaheed Shorawardy Medical College, Dhaka, Bangladesh in where statement of victim and opinion of reporting doctors are available[12]. Sometimes evidence might not be collected, preserved or properly supplied. There might be faulty sample collection or improper laboratory examination[13]. But findings of this study not too far away from reality. It does not reflect exact socioeconomic condition of the country[14].

Ethical Considerations:

The confidentiality of cases, information was maintained, when the data were obtained from record books of the department of Forensic Medicine and Toxicology, Shaheed Shorawardy Medical College, Dhaka, Bangladesh**.**

Acknowledgement:

We appreciate the assistance and co-operation of the department of Forensic Medicine and Toxicology, Shaheed Shorawardy Medical College, Dhaka, Bangladesh.

Conclusion:

In conclusion, alleged rape was occurred under the age of 20 years and two third of the assailants was known to her, Incidence mostly occurred in the victim's own house or nearby places. In most cases victim come for medical examination after 24 hours of the incident. Mostly victims were unmarried and no positive findings in favour of forceful sexual intercourse. Social awareness, religious explanation, neutrality of investigation of such sexual crime. Non prolongation of prosecution time and proper punishment of accused create example in the society. Thus it will help to decrease such incidence from the society.

References:

1. Reddy KSN. The essentials of Forensic Medicine & toxicology. 35th edition. New Delhi: Jaypee Brothers Medical Publishers; 2022.
2. Ain O Salish Kendra. Violence against Women, Rape (Jan-Dec 2022). Dhaka (Bangladesh); 2023.
3. Nandy A.Principles of Forensic Medicine including toxicology. 3rd edition. Dhaka: New Central Book Agency; 2015.
4. Prof Karim KA. Forensic Medicine & Toxicology. 2nd edition. Dhaka: National Book centre; 2020.
5. Subrahmanyam BV. Parikh's textbook of medical Jurisprudence, Forensic Medicine & Toxicology. 7th edition. New Delhi: CBS Publishers & Distributors Pvt Ltd, India; 2016.
6. World Health Organization. World report on violence & health. Geneva: World Heath Organization; 2002.
7. Prof Chowdhury AH. The basics of Forensic Medicine & Toxicology. Bogra: 2019.
8. Hannah Ellis-Petersen. Bangladesh approves death penalty for rape after protests. The Guardian. 2020 Oct 12:1.
9. The Penal Code, 1860-Laws of Bangladesh, Legislative and Parliamentary Affairs Division Ministry of Law, Justice and Parliamentary affair 2010.
10. Islam MN. Retrospective Study of Alleged Rape Victim Attended at Department of Forensic Medicine, Dhaka Medical College Bangladesh. Legal Med 2003;5(1): 351-353.

11. Struckman-Johnson C, Struckman-Johnson. A comparison of sexual Coercion Experiences Reported by Men and Women in prison. J Interpersonal Violence. 2006;21(12):1591-1615.

12. Khatun K, The Definition of Rape and some important issues.

13. Al-Azad MAS, Rahman Z, Ahmed M, Wahab MA, Ali M, Khalil MI. A Study on Socio-Demographic Characteristics of Alleged Sexual Assault (Rape) cases in Dhaka City, JAMC Bangladesh. 2011;7(2):21-24.

14. Sarkar SC, Lalwani S, Rautji R, Bhardwaj DN, Dogra TD. A Study on Victims of Sexual Offences in South Delhi, J Family Welfare. 2005;51(1):60

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A Study of Aetiological Profile and Clinical Presentation of Hepatosplenomegaly in Tertiary Care Hospitals

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Abstract:

Background: Hepatosplenomegaly is a feature of a number of diseases frequently encountered in clinical practice. The study was done to determine the aetiological pattern of hepatosplenomegaly in adults. Method: This is an observational type of cross-sectional study. A total of 100 cases of hepatosplenomegaly admitted in different medicine units of Dhaka National Medical College and Hospital, Dhaka Medical College Hospital and Sir Salimillah Medical College and Mitford Hospital, Dhaka were in included in this study, during a period from December 2008 to November 2009.Result: The patients were of both sexes. The age of the youngest patient was 13 years and that of the oldest one was 80 years. Mean age of the cases was 36.26 years. The most common presenting features was anemia 60(%) followed by Fever (32%), swelling of the abdomen (28%), mass in the abdomen 18% and jaundice (8%). Of the physical signs present in these 100 cases, lymphadenopathy was the predominant finding next to pallor (28%), then lymphadenopathy and ankle edema and ascites were present in 26% of cases each. Regarding aetiological aspect of these 100 cases of hepatosplenomegaly, high incidence of malignancies and comparatively low incidence of infective aetiologies are the striking features. Lymphatic and haemopoietic tissue malignancy are the number one causes of hepatosplenomegaly. It constitutes of cases, of which chronic granulocytic leukaemia (CGL) 46%, non-Hodgkin's lymphoma 24% and acute lymphoblastic leukaemia (ALL) 10%. The reason for lower incidences of infective causes of hepatosplenomegaly may be due to developed health services at the Upazilla level and below and increased incidences of malignancies may be due to the fact that the majority of cases were from the referral hospitals.

Keywords: Hepatosplenomegaly, splenomegaly, hepatomegaly, malignancy

Introduction:

Hepatosplenomegaly is a feature of a number of diseases frequently encountered in clinical practice. It sometime produces considerable diagnostic dilemma for the physician due to multiple factors, Hepatosplenomegaly is a condition that causes swelling and enlargement of the liver and spleen. Medical conditions related to the liver often begin with the prefix “hepat-” (such as hepatitis) and “splen” refers to the spleen. The term “megaly” indicates that something is abnormally large. Because both the spleen and liver play essential roles in the body, it is crucial to identify and correct any underlying causes of hepatosplenomegaly.

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The study is aimed to find out the common cause’s hepatosplenomegaly in hospitalized patients so as to give emphasis on necessary preventive and therapeutics measures.

The etiological pattern of hepatosplenomegaly varies from country to country, may even very in different parts of the country, for example Kala-azar is a common cause of hepatosplenomegaly in northern Bangladesh. 1,2 Although Kala-azar largely disappeared from Bangladesh during 1960s and 1970s sporadic cases were being reported[1,2], which probably served as the reservoir explaning the recent resurgence of the disease in endemic form[3].

On the other hand, Malaria might be the common cause of hepatosplenomegaly in Chittagong division. A study on180 cases of malaria reveals splenomegaly 14.4%, hepatomegaly 6.6% and hepatosplenomegaly 12.7%.[4].

Migration of people, improved communication and rapid traveling facilities has turned the world into a global village. This migration of people along with emergence of drug resistance might have changed the etiological pattern of hepatosplenomegaly in our country. Few studies on this topic have been performed in our country in recent times.

Also, in a study based on major hospitals (IPGMR, DMCH, SSMC) of Dhaka city in 1987 showed haemopoietic tissue malignancy (46%) as the leading cause of hepatosplenomegaly with infections (22%), Liver disease (20%) and heamoglobinopathy (10%) in the 2nd,3rd and 4th place respectively[5].

Both liver and spleen are rich in mononuclear phagocytic system. Once organism gain access to the blood stream, liver and spleen take part in removal of the organism from our system. Then in various bacterial, viral and protozoal diseases hepatosplenomegaly is a common feature.

Lack of modern laboratory facilities in most hospital and poor economic condition of the patients makes it imperative that our physician rely heavily on clinical features and epidemiological data (which are very scarce) to make a diagnosis. So, a background knowledge regarding common etiological pattern of hepatosplenomegaly in our country will help all levels of physician in prompt diagnosis with limited laboratory investigation.

Materials and methods:

Hepatosplenomegaly is a frequently encountered clinical problem in our country. This is an observational type of cross-sectional study a total of 100 cases admitted in medical units of Dhaka National Medical College & Hospital, Dhaka Medical College & Hospital and Sir Salimullah Medical College and Mitford Hospital, Dhakawere included in this study, from December 2015 to November 2016. Method of case collection was random. This included patient of both sexes, all above theage of 13years. It is a retrospective study.

Result:

A total of 100 cases of hepatosplenomegaly admitted in different medicine units of Dhaka National Medical College and Hospital, Dhaka Medical College Hospital and Sir Salimillah Medical College and Mitford Hospital, Dhaka were in included in this study, during a period from December 2008 to November 2009.

Table-1 : Respective disease and age incidence.

Disease	Age range	Number	Percentage
Acute lymphoblastic leukaemia (n=8)			
	13-22	6	75
	23-32	2	25
	33-42	0	0
	43-52	0	0
	>52	0	0
Kala-azar (n=20)			
	13-22	3	15
	23-32	8	40
	33-42	5	25
	43-52	4	20
	>52	0	0
Chronic granulocytic leukaemia (n=24)			
	13-22	0	0
	23-32	1	4.17
	33-42	3	29.17
	43-52	7	12.50
	>52	13	45.17
Cirrhosis (n=20)			
	13-22	1	5
	23-32	2	10
	33-42	3	15
	43-52	8	40
	>52	6	30
Lymphoma (n=10)			
	13-22	4	40
	23-32	4	40
	33-42	2	20
	43-52	0	0
	>52	0	0
Thalassaemia and haemoglobinopathy			
	13-22	8	80
	23-32	2	20
	33-42	0	0
	43-52	0	0
	>52	0	0

Table -III shows the commonest age group of ALL was between 13-22 years, 6(75%). The highest number of cases of Kala-azar belong to the age group between 23-32 years, 8(40%) years. The highest number of cases of CGL fall into the age range of >52 years, 13(45.17%). 8(40%) cases of cirrhosis of the liver belong to the age group 43-52 years, 3(15%) 33-42 years and 2 (10%) cases belong to the age group between 23-32 years. Lymphoma comprises 4 cases (40%) in each age range between 13-22 years and 23-32 years, and 2 cases (20%) age range between 33-42 years. Thalassemia comprises 8(80%) cases in the age range of 13-22 years and 2(20%) cases of 23-32 years.

Table-2 : Showing presenting symptoms (n=100)

Presenting Symptoms	Number	Percentage
Fever	32	32
Swelling of the abdomen	28	28
Mass in the abdomen	18	18
Yellow colouration of urine and eye	8	8
Inguinal region	4	4
Pain in joints and bones	6	6
Weakness	2	2
Gradual loss of weight	2	2
Total	**100**	**100**

Table-2 shows fever was the presenting symptom in highest 32(32%) cases followed next by 28(28%) cases with swelling of the abdomen as the presenting complaint.

Table-3: Showing clinical findings (n=100)

Signs	Number	Percentage
Anemia	100	100
Lymphadenopathy	28	28
Ankle oedema	26	26
Ascities	26	26
Jundice	25	25
Progressive Blackening of whole body	16	16
Pruritis	15	15
Engorged veins of the abdomen	16	16
Finger clubbing	4	4
Yellow colouration of body	4	4

Anemia was the commonest finding in 100(100%) cases, followed next by lymphadenopathy (28%) and 26% caseseach of oedema and ascities as shown in Table -3.

Figure-1: Pie-chart shown the degree of splenomegaly of the patients.

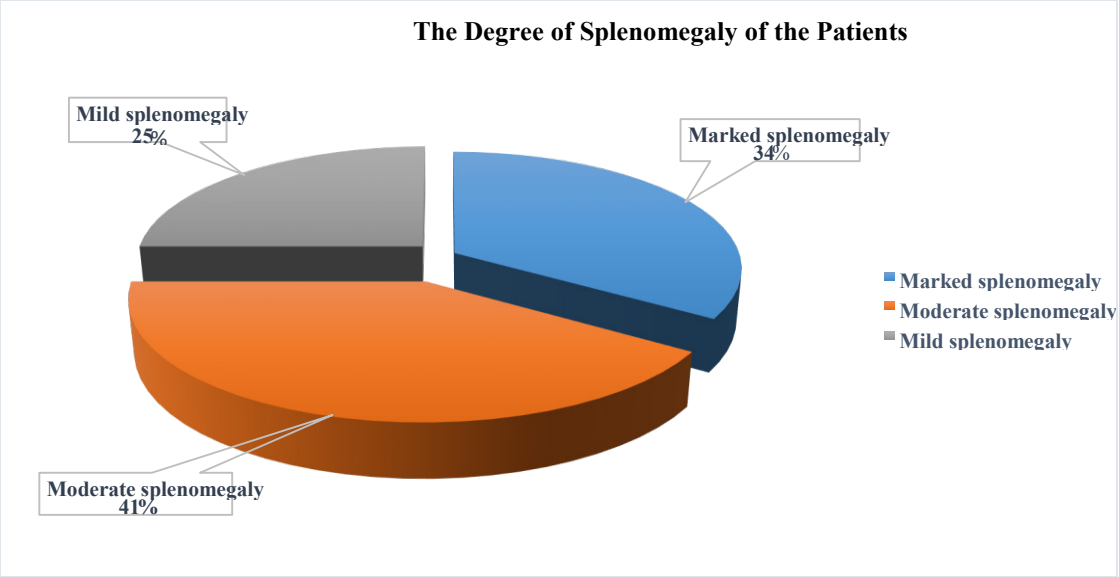


Figure-1 shows 41(41%) cases present with moderate splenomegaly followed 34(34%) cases each with marked splenomegaly and mild splenomegaly 25(25%) cases.

Table-4: Showing hepatomegaly in respective diseases.

Diseases	Liver size Less than 5 cm	Liver size Between 5-10 cm	Liver size Above 10 cm
CGL (n=24)	8	12	4
Kala-azar (n=20)	6	14	0
Cirrhosis of liver (n=20)	10	8	4
Lymphoma (n=10)	6	4	0
Thalassemia	4	4	2
Haemoglobinopathy (n=10)			
ALL (n=8)	4	4	0
CLL (n=2)	0	2	0
Malaria (n=2)	0	0	0
AML (n=2)	2	0	0
Typhoid fever (n=2)	0	2	0

Multiple response:

14(70%) cases of Kala-azar followed by 12(50%) cases of CGL have hepatomegaly between 5-10 cm. 6(60%) cases of lymphoma and 10(50%) cases of cirrhosis of the liver followed by 8(33.33%) cases of CGL, and 4(50%) cases each of ALL, thalassemia, and haemoglobinopathy had liver size less than 5 cm.4(36.67%) cases of CGL,cirrhosis of liver 4(20%) and thalassemia and haemoglobinopathy 2(20%) had hepatomegaly above 10 cm shown in Table-4.

Table-5: Shows the laboratory investigations done (n=100)

Name of investigations	Number	Percentage
TC of WBC	100	100
DC of WBC	100	100
Platelet count	64	64
ESR	52	52
HBsAg	30	30
PBF	24	24
CFI for Kala-azar	26	26
AT	8	8
Serum bilirubin	54	54
SGPT	54	54
SGOT	18	18
Alkaline phosphatase	46	46
Total serum proteins	30	30
Prothrombin time	14	14
Bone marrow examination	54	54
Hb-electrophoresis	12	12
Lymph node biopsy	10	10
Liver biopsy	8	8
X-ray chest	100	100
Ultrasonography	16	16
Fasting blood sugar	26	26
Blood urea	22	22
Routine examination of stool and urine	100	100
Direct Agglutination test	24	24

*Multiple response

Discussion:

Hepatosplenomegaly is an important clinical presentation. This study was done on 100 cases with hepatosplenomegaly. In the present study majority of the patient were male (82%) and female was (18%). Other study on hepatosplenomegaly shows 66% were male and 34% were female[9]. Another study also found the majority of the patients of hepatosplenomegaly were male (73%), and (62%)[10,11]. So the present study is consistent with study done by other[9,10,11]. Male preponderances was also reported by other studies[12]. This may be due to the fact that male patients present themselves in Hospital more commonly than female.

Chronic granulocytic leukaemia:

Out of 100 cases of hepatosplenomegaly, chronic granulocytic leukaemia comprises the highest number. There were 24% cases of chronic granulocytic leukemia. Previous study showed the incidence of chronic granulocytic leukemia (CGL) in 23.33%[13] and 56.1%[8] of cases which is consistent with the present series, and CGL is the most frequent morphologic type of leukaemia at leukaemia. The higher incidence of CGL found due to study on all leukemia patients[8].

Anemia was present in 100% of cases, 60% cases were moderately anemic and 18% cases were severely anemic. But previous study found severe anemia in 45.6% cases and moderate anemia in 41.2% of cases[8]. The difference may be due to small number of cases (n=12) and early detection of the disease.

Lymphatic leukemia (both acute and chronic)

Lymphatic leukaemia (both acute and chronic) were found in 34% cases in all haemopietic and lymphatic neoplasm and 18.46% cases of lymphatic leukaemia in all neoplasm (lymphatic and haemopoietic neoplasm) found in another study which is 17.39% cases [14].

Of all cases 8.1% cases were acute lymphoblastic leukaemia (ALL)[8]. In the present study, ALL was found in 8% of cases and chronic lymphatic leukaemia (CLL) was found in 2% of cases and acute myeloblastic type was found in 2% of cases.75% of cases of acute lymphoblastic leukaemia (ALL) were found in 13-22 years. All the patient of ALL was anemic (100%). Moderate anemia was found in 6(75%) of cases. Other study showed severe anemia in 93.5% of cases[8]. This may be due to earlier detection of the disease. The incidence of CLL is consistent with all the four studies[8,11,13,15]. But the incidence of AML in the present study is far below the findings of others. Increased incidence of AML was also shown by other as 7.31% in lymphatic and haemopoietic tissue malignancy[15]. The increased incidence of AML also found by others may be due to their studies on all leukaemic patient[8,13].

Cirrhosis of liver:

Cirrhosis of liver constitutes 20% of cases of hepatosplenomegaly in the present study which is much higher than 2.6% of cases of cirrhosis of liver[9]. The higher incidence in the present study may be due to small number of cases. But another author found also same incidence of the disease.

40% of cases were found between 43-52 years. 30% of cases in >52 years and 15% of case in 33-42 years. Rahman A (1983) found highest (28%) incidence of cirrhosis of liver in the age group 41-50 years. He found 24% of cases in 31-40 years[11]. The present study reflects same incidence of cirrhosis of liver in adult age group. Because the present study sample are adult age group.HBsAg was negative in 100% of the cases in the present study. No case was found HBsAg positive in contrast to 24% of cases of cirrhosis of liver with positive HBsAg found by other study[10]. It is probably the NANB virus responsible for chronic liver disease in the present study. Ascites was present in 90% of cases. Ascites was found in 80.51% and 72% of cases[9,11]. The higher incidence in the present study may be due to too small number of cases. Ascites was found between 57%-85% of cases in two separate studies. But another study found ascites in 93% of cases which is consistent with the present finding[10].

Kala-azar:

Kala-azar was found in 20% of cases of hepatosplenomegaly in the present study. 40% of cases were in the age group of 23-32 years. Highest incidence was found in 5-10 years followed by 10-20 years ago group in his study which includes only paediatric patients[16], though in previous study young adults and teenagers were found as the main victims of Kala-azar in the age group of 10-29 years in a series of 30 patients in a single village[17]. The difference of finding may be that the present study was done in adults and in a small number of patients (n=20). 80% of cases were male and 20% of cases were female in the present series with a male female ratio of 4:1. Overall male preponderance was also found with male: female = 66.34 or 1.94:1[16]. In Bihar of India, the male-female ratio below 10 years of age was 1:1 found[17], which differs grossly with the present study. Another showed male female ratio as 5.7:1[7], which is close to the present finding. It was believed that if a house-to-house survey were made, the sex incidence would be almost equals[7]. Same study result was observed by others was found 46% patient study because the study was done in Northern Bangladesh[14]. Diagnosis of Kala-Azar was done by Direct agglutination test and demonstration of Leishmania Donovan bodies in bone marrow. Aldehyde test also positive. Aldehyde test was positive 92% and 79.01% in Kala-Azar cases respectively[9,12].

Lymphoma:

Non-Hodgkin's lymphoma constitutes 10% of cases of hepatosplenomegaly in the present study. Of all lymphatic and haemopoietic tissue neoplasm, non-Hodgkin's lymphoma comprises 27.60% of cases in present series. Another study found the incidence of non-Hodgkin's lymphoma as 21.73% of cases[17]. Hodgkin's disease was absent in the present study. But other study found 77.5% of cases of non-Hodgkin's lymphoma and 22.5% of cases of Hodgkin's disease[15].The ratio between non Hodgkin's lymphoma and Hodgkin's diseaseis 4.44:1. De Gruchy (1984) found the ratio as 3:1[6]. The higher incidence of non-Hodgkin's lymphoma in the present study might be due to very small number (n=5) of cases and short period of study for 12 months only.

Various study on leukemia showed the incidences of different stages of non- Hodgkin's lymphoma. The nodular variety presented mainly in the stage III and IV in diffuse variety presentations were in stage IV and also in other stage[15,17]. 35.48% of the cases in stage IV and rest of the cases were in other stages. In the present study 100% cases were in stages IV which may be due to late attendance.

Regarding aetiological aspect of these 100 cases of hepatosplenomegaly, high incidence of malignancies and comparatively low incidence of infective aetiologies are the striking features.

Conclusion:

This is a small study done on hospital population but it revealed some striking features regarding the causes of hepatosplenomegaly in adults. But still some hints have evolved from this study regarding the aetiological incidences of hepatosplenomegaly in the country. Neoplasms of the lymphatic tissues and of the haemopoietic tissues top the list of causes while infections- bacterial, viral, spirochaetal, fungal, protozoal except Kala-azar contribute the least with a reflection of resurgence of visceral leishmanisis in recent past. Of infections Kala-azar showed a dreadful increase in incidence. The reason for lower incidences of infective causes of hepatosplenomegaly may be due to developed health services at the Upazilla level and below and increased incidences of malignancies may be due to the fact that the majority of cases were from the referral hospitals. Multicenter study with large sample size is warranted to develop more insights about diagnosis and management of hepatomegaly.

The present study has showed the most prevailing diseases causing hepatosplenomegaly in the country though it may not be the exact picture applicable for the whole community. This may be regarded as an attempt to modestly review the problem and further studies will perhaps be more revealing.

References:

1. Chowdhury MAJ, Alam MN, Rafique Uddin AKM, Hussain A, Rahman H, Siddique AB et al. Clinical profile of Kala-azar in Rajshahi; A prospective study of 273 hospitalized patients during one year. Journal of Bangladesh College of physicians and Surgeons. 1990; 8(1): 18-23.

2. Journal of Clinical Oncology, 2007 ASCO Annual Meeting Proceedings Part I. Vol 25, No. 18S (June 20 Supplement). 2007: 10025.

3. Elias M, Rahman AJMM, Khan NI. Visceral leishmaniasis and its control in Bangladesh. Bull WHO 1989; 67(1): 43-9.

4. Hussain A, Chowdhury MAJ. The editorial: Kala-azar hits again. J Teach Assoc (TAJ). 1988; 1(2).

5. Rashid KM, Khabiruddin MD, Hyder S. Text Book of community medicine and Public Health. 2nd ed. Dhaka: RKH Publishers; 1999. P. 317.

6. Walter JB, Talbot IC. Walter and Israel General Pathology. 7th ed. New York: Churchill Livingstone; 1996.

7. Braunwald E, Fauci A, Kasper DL, Hauser SL, Longo DL, Jameson JL, editors. Harrison's Principles of Internal Medicine. 15th edn. McGraw Hill Inc 2001; 1: 362-65, 804-08, 121317.

8. Firkin F, Chesterman C, Peningtom D, Rush B, editors. de Gruchy's clinical haematology in medical practice. 5th edn. Delhi: Oxford University Press 1995: 32, 241, 281, 346-52.

9. Aikat BK, Sohaya SS, Pathania AG, Bhattacharya PK, Desai N, Prasad LS, et al. Clinical profile of cases of Kala-azar in Bihar. Ind J Med Res. 1979; 70:563-70.

10. Eichner ER, Whitfield CL. Splenomegaly an algorithmic approch to diagnosis. JAMA. 1981; 246(24): 2858-2861.

11. Geogre D, Lundberg MD, Splenomegaly. JAMA. Dec 1981; 246(24): 2848-49. 54

12. Kushwaha MRS, Mehrqtra RML. Leukaemias at Lucknow- A study of 200 cases. Indian J Cancer. 1978; 15(3): 28-34.

13. Gleckman R, Crowley M. Epesito A; fever of unknown origin, a review from the community hospital. Am J Med Sci. 1977; 274: 21-25.

14. Hossain SZ. Clinicopathological investigation to identify aetiology of fever of unknown origin in 50 hospitalized children (Dissertation) BCPS 1987.

15. Dutta AK. Pyrexia of unknown origin in children (Dissertation), BCPS 1993.

16. Dleer JJ, Russel PK. Tropical fever of unknown origin in Vietnam. JAMA. 1970; 211: 1690.

17. Meyers AR. Medicine, the national medical services for independent study. 2nd ed. Malvern: Harwal Publishers;1994. P. 113.

DCIMCJ

Original Article

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Serum Estrogen Level in Surgical and Natural Menopausal Women

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Abstract:

Background: Menopause is a natural process. After menopause the morbidity and mortality in women from postmenopausal symptoms, dyslipidemia and osteoporosis is increased due to lack of estrogen. Serum estrogen level is lower in surgical menopausal women than that of natural menopausal women. Objective: To compare the serum estrogen level in both surgical and natural menopausal women in Bangladesh. Methods: This Cross sectional study was carried out in the Department of Physiology, Sir Salimullah Medical College, Dhaka at 2018. A total number of 60 female subjects were included in this study. Among them 30 surgical menopausal women age ranged from 45-55 years were included in the study group (Group B). Again, 30 natural menopausal women age ranged from 50-60 years were studied as control group (Group A). All the menopausal women were selected from Out Patient Department (OPD) of Gynaecology and Obstetrics of Sir Salimullah Medical College and Mitford Hospital. Premenopausal women were selected by personal contact. Estimation of serum estrogen level by MEIA method in both natural and surgical menopausal women was done. The statistical analysis was done by using appropriate method as applicable. Results: Serum estrogen level was lower in surgical menopausal women than those of natural menopausal women. Conclusion: The present study revealedthat surgical menopausal women have lower level of serum estrogen than that of natural menopausal women.

Keywords: Natural menopause, surgical menopause, estrogen

Introduction:

Menopause is an universal and irreversible part of the over all aging process in women's life. Menopause whether it occurs naturally or surgically is characterized by reduced production of ovarian hormone[1]. The natural menopause occurs usually between the ages of 45 to 52 yrs. Where as surgical menopause i,e hysterectomy with bilateral oophorectomy is performed due to different pathological causes before natural menopause[2]. The ovary is a dynamic organ of female reproductive life and it undergoes functional and morphological changes during life time[3]. After menopause there are major changes in estrogen, progesterone, androgen and gonadotropin levels which may be due to cessation of ovarian follicular activity[4]. There is a lots of changes on hypophysio- ovarian endocrinological function in both surgical and natural menopausal women. All the postmenopausal symtoms appear earlier in surgical menopausal women than those of natural menopausal women[5]. It is due to serum estrogen level is lower in surgical menopausal women than that of natural menopausal women[6]. There is 66% reduction of estrogen level after menopause[7].

Small amount of estrogen and androgens are produced by ovary in natural menopausal women[8]. Whereas, after bilateral oophorectomy, serum estrogen and testosterone level decrease and follicle stimulating hormone rises suddenly. Moreover, surgical menopausal women have lower level of androgen than natural menopausal women even beyond 65 years of age[4]. Some investigators suggested that a significant amount of estrogen in menopausal women come from peripheral conversion of androstenedione in adipose tissue.

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Thus the conversion is greater in obese women[9]. Therefore, after surgical removal of ovary, there is significant decrease in androgen production resulting decrease in estrogen level[10].

Surgical menopause was found to be strongly associated with postmenopausal syndrome, dyslipidaemia and osteoporosis than those of natural menopausal women[11]. Postmenopausal syndrome and its complication in Bangladeshi women are increasing with time. Although recently some studies have been done on postmenopausal symptoms in menopausal women in our country[12]. But little is known about the serum estrogen level in surgical menopausal women. Therefore, the present study has been undertaken to compare the serum estrogen level in the surgical and natural menopausal women in Bangladesh. It is expected that the findings of the study create awareness among the women who undergone surgical menopause that they are at higher risk of postmenopausal complication due to deficiency of estrogen hormone.

Methods:

This Cross sectional study was carried out in the Department of Physiology, Sir Salimullah Medical College, Dhaka at 2018. A total number of 60 female subjects were included in the study. Among them 30 surgical menopausal women age ranged from 45-55 years were included in the study group (Group B) and 30 natural menopausal women age ranged between 50-60 years were studied as control group (Group A). All the menopausal women were selected from Out Patient Department (OPD) of Gynaecology and Obstetrics of Sir Salimullah Medical College and Mitford Hospital. All the subjects were belonged to lower middle socioeconomic status. Subjects with any disease such as hypertension, diabetes mellitus, skeletal disorder, tuberculosis, heart disease and other acute and chronic disease, history of fracture, suffering from mental disorder, using prescribed medicine, alcohol users, and smokers were excluded from the study. The aim, objectives, risk and the procedure of the study were explained in details to the subjects and their written informed consents were taken.

Ethical approval was taken from the Institutional ethics committee (IEC) of Sir Salimullah Medical College. Detailed family history and medical history of the subjects were also taken. Then their general information and data were collected in the prefixed questionnaire. With all aseptic precautions, five (5) ml of venous blood was drawn from median cubital vein by sterile disposable syringe. Serum estrogen level was estimated by MEIA method in the the Department of Biochemistry, BSMMU, Dhaka. Blood pressure measurement and fasting blood sugar of all the participants were also done in the laboratory of Physiology Department, Sir Salimullah Medical College for exclusion of patients from hypertension and diabetes mellitus. Statistical analysis was done by using Statistical package of social service (SPSS) for windows version–15. Data were expressed as mean ± SD.

Results:

General characteristics of the subjects

Age:

The results are shown in Table I

In this study, mean (±SD) age were significantly ($p<0.001$) lower in surgical menopausal women than that of natural menopausal women.

BMI:

The results are shown in Table I.

BMI of all subjects were within reference range. In this study, whereas, there were no significant differences of this value observed between surgical and natural menopausal women.

Blood Pressure:

Results are shown in Table-I.

Systolic BP:

The mean (±SD) systolic BP of all subjects were within reference range in relation to age and sex. Again, this value was higher in surgicalmenopausal womwn than that of natural menopausal women, but it was not statistically significant.

Diastolic BP:

The mean (±SD) diastolic BP of all subjects were within reference range in relation to age and sex. There was no significant differences of this value observed between surgical and natural menopausal women.

Fasting blood sugar (FBS):

The results are shown in Table-I. The mean (±SD) levels of FBS of all the subjects were within reference range in relation to sex and age. No significant differences was observed in this value between surgical and natural menopausal women.

Table -I: **Age, BMI, Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Fasting Blood Sugar (FBS) in different groups (n=60)**

Groups	n	Age (year)	BMI (kg/m^2)	SBP (mm of Hg)	DBP (mm of Hg)	FBS (mmol/L)
A	30	56.03 ± 2.63 (52-60)	23.34 ± 0.77 (21.00-24.20)	113.17 ± 8.15 (100-130)	70.50 ± 11.01 (60-95)	4.11 ± 0.65 (3.02-5.16)
B	30	50.80 ± 3.00 (45-55)	23.64 ± 0.72 (22.04-24.80)	114.83 ± 8.86 (100-130)	74.33 ± 10.32 (60-90)	4.20 ± 0.73 (3.02-5.17)

Statistical analysis:

Groups	p value				
A vs B	0.001***	0.999^{ns}	0.364^{ns}	0.999^{ns}	0.999^{ns}

Result are expressed as Mean ± SD. Statistical analysis was done by One way ANOVA and Bonferroni test. Figures in parentheses indicate ranges.

Group A: Natural menopausal women.

Group B: Surgical menopausal women.

* = Significant at $p < 0.05$

*** = Significant at $p < 0.001$

ns = Not significant.

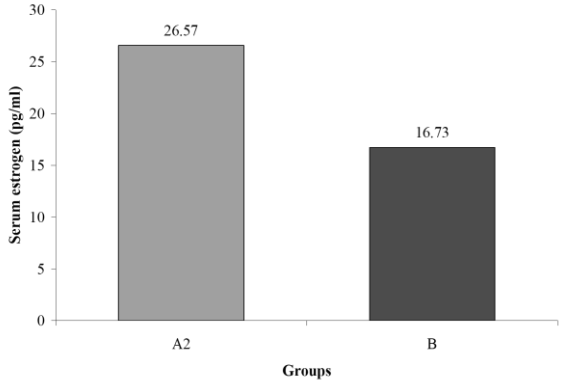
n= total number of the subject

Estrogen level in postmenopausal women:

The results are shown in Figure 1

The mean (±SD) serum estrogen level was significantly ($p<0.001$) lower in surgical menopausal women than that of natural menopausal women.

Figure-1:Mean Serum Estrogen level in postmenopausal women (n=60)



Group A: Natural menopausal women. (Control)

Group B: Surgical menopausal women. (Study)

n= total number of the subject

Distribution of study subjects by duration of menopause (n=60):

The results are shown in Table II

Percentage of subject with menopausal duration > 5 years was significantly (P< 0.05) higher in group B than that of group A.. Again, Percentage of subject with menopausal duration ≤ 5 years was significantly (P< 0.05) higher in group Athan that of group B.

Table-II:Distribution of study subjects by duration of menopause (n=60)

Groups	n	Duration of menopause	
		≤5 years No. (%)	>5 years No. (%)
A	30	15 (50.0%)	15 (50.0%)
B	30	7 (23.3%)	23 (76.7%)

Statistical analysis:

	p value	
A vs B	0.032*	0.032*

Statistical analysis was done by Chi-square test.

Group A: Natural menopausal women (Control)

Group B: Surgical menopausal women (Study)

* = Significant at p <0.05

n= total number of subjects

Discussion:

In the present study, the mean (± SD) serum estrogen level was significantly lower in surgical menopausal women than that of natural menopausal women. Similar observation was also made by other investigators.(1,7)

Bachmann G et al[6] revealed similar findings by reporting that in surgical menopausal women , estrogen and androgen levels were significantly decreased and so physiological changes associated with surgical menopause occur quickly as compared to natural menopausal women. It has also been suggested that estrogen level drops abruptly in women with bilateral oophorectomy whereas gradually in natural menopausal women[13]. However, after natural menopause, ovaries continue to produce significant amount of androgens, which are converted to estrogen peripherally[8].

In natural postmenopausal women by the time when the ovaries ceases to produce estradiol, it is produced in a number of extragonadal sites mainly in adipose tissue, but still estradiol levels are much below than their levels in premenopausal period[3]. It is observed that these production from extragonadal sites starts around 12-18 months later in surgical menopausal women as they all are at much younger age than natural menopausal women. On the other hand small amount of estrogen and androgens are still being produced by ovary in natural menopausal women and also there is gradual a decrease of estradiol in natural menopause which may be responsible for comparatively lower estrogen levels in surgical menopausal women. In this study we have found that serum estrogen levels in surgical menopausal women is low as compared to that in natural menopausal women. This hormonal imbalance may be a cause of increased risk of metabolic syndrome in surgical menopausal women[8, 13-16].

Conclusion:

From the present study, it can be concluded that serum estrogen level is lower in surgical menopausal women than that of natural menopausal women. So, surgical menopausal women have greater chance of postmenopausal complications like dyslipidaemia and osteoporosis than those of natural menopausal women.

Acknowledgement:

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References:

1. Kaur N, Malla V, Gupta S. Serum estradiol level and post menopausal symptoms in surgical and natural menopause.Ini J Repord Contracept Obstel Gynecol. 2017;6(9):3020-3923.
2. Speroff L, Glass RH, Kase NG. Clinical Gynecologic Endocrinology and Infertility. 5th ed. Philadelphia: Williams & Wilkins; 1994. P.121-164.
3. Simpson ER. Sources of estrogen and their importance. J steroid Biochem Molecul Biol. 2003; 86:225-30.
4. Davison SL, Bell R, Donath S, Montalto JG, Davis SR. Androgen levels in adult females: changes with age, menopause and oophorectomy. J Clin Endocrinol Metab. 2005; 90: 3847-3853.
5. Taylor M. Psychological consequences of surgical menopause: In Journal of Reprod Medicine. 2001; 46(3): 317-24.
6. Bachmann G. Physiologic aspects of natural and surgical menopause: In Journal of Reproductive Medicine. 2001; 46(3): 307- 315.
7. Naikraviraj R, Chandelrintu S, Abikandani G. Comparison of serum estradiol levels in surgical and natural menopause, IOSR Journasl of pharmacy and biological science. 2014; 9:65-67.
8. Fogle R, Stanczyk F, Zhang X, Paulson R. Ovarian androgen production in postmenopausal women. J Clin Endocrinol Metab. 2007;92(8): 3040-3043.
9. Erlik Y, Meldrum DR, Judd HL. Estrogen levels in postmenopausal women with hot flashes. Obstel Gynecol. 1982;59:403-407.
10. Laghlin GA, Barrett-Connor E, Kritz-Silverstein D, Muhlen DV. Hysterectomy, oophorectomy and endogenous sex hormone levels in older `women: the rancho bernardo study. The Journal of Clinical Endocrinology and Metabolism. 2000;85(2): 645-651.
11. Kate MB. Can hysterectomy be considered a risk factor for cardiovascular disease? Circulation. 2005; 111:1456-8.
12. Ahmed Q, Rahim CFMM, Masood N, Nahar K, Khaton S. Association of dyslipidaemia and obesity in poatmenopausal Bangladeshi women, Bangladesh J obstel Gynaecol. 2020;3:20-24.
13. Howard BV, Kuller L, Langer R, Manson JE, Allen C, Assaf A, et al. Risk of cardiovascular disease by hysterectomy status, with and without oophorectomy. Circulation. 2005; 111:1462-1470.
14. Purohit A, Reed MJ. Regulation of estrogen synthesis in postmenopausal women.J Steroid BiochemMol Biol. Nov 2002; 67(12): 979-983.
15. Creatsas G, Christodoulakos G, Lambrinoudaki I. Cardoivascular disease: Screening and management of the asymptomatic high risk postmenopausal women. Maturitas 2005; 52S: S32-S37
16. Barrett-Connor E, Bush TL. Estrogen and coronary heart disease in women. JAMA 1991; 265(4): 1861- 1867

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Original Article

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A Comparative Study of Cold Steel and Bipolar Diathermy Tonsillectomy Method

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Abstract:

Background: Cold steel dissection and bipolar diathermy are commonly used technique of tonsillectomy operation with quite satisfactory results. A number of studies have been made many a times regarding comparing these techniques all over the world. Objectives: This study was done to find out a procedure which has least per operative & postoperative morbidity. Methods: This case control study was carried out in the department of Otolaryngology & Head - neck surgery, Dhaka Central International Medical College Hospital. Forty patients of ages between 16-45 years with indication of tonsillectomy were selected from outpatient department & randomly assigned to any of the two groups. Standard per - operative & postoperative care was followed. Results: The amount of blood loss during cold steel method is significantly higher (p value <.0001) than diathermy method. Postoperative pain was much higher in case of tonsillectomy with bipolar diathermy than the patients of cold steel dissection method. Conclusion: Tonsillectomy with bipolar diathermy was a better technique compared to dissection method in terms of intraoperative blood loss & time taken for surgery. But bipolar diathermy method is associated with more post-operative pain.

Keywords: Tonsillectomy, bipolar diathermy, cold steel

Introduction:

Tonsillectomy is one of the most frequently performed surgery in the field of Otorhinolaryngology. The first description of tonsillectomy was done by Cornelio Celsius in the first century BC[1]. Apart from recurrent tonsillitis, history of peritonsillar abscess, obstructive sleep apnea & suspected tonsillar malignancy are common indication of tonsillectomy. Tonsillectomy is a two stepped procedure. One is to removal of the tonsils from the bed & second is to secure hemostasis. Removal of the tonsils can be achieved by different methods for example, cold steel dissection, laser, bipolar diathermy, coblation & ultrasonic scalpels. This technique do influence the intraoperative time & postoperative bleeding[2]. Securing of hemostasis during tonsillectomy is the integral & utmost step in the entire procedure. It bears a significant role in the postoperative morbidity of the patient. For the purpose of hemostasis, different techniques are used. Ligature of the vessels to stop the bleeding vessels during tonsillectomy was first adopted by Cohen 1909[3]. The use of monopolar diathermy in tonsillectomy was first introduced by Haase and Noguera and Johnson[3,4,5]. After that Reed & Sinder refined the techniques by using bipolar diathermy[6].

Cold steel method is the earliest method & still one of the most commonly performed method to date in the developing world. Diathermy assisted (bipolar) tonsillectomy has gained popularity in recent years. Though in many nations, others method like laser-assisted tonsillectomy & coblation have gained significant popularity but in a developing country like Bangladesh, cost of surgery is a major issue for which these methods are less commonly performed.

Cold steel dissection & bipolar diathermy are two commonly used technique for tonsillectomy operation. Because of the diversity in opinions regarding efficacy and safety of these two techniques in the international literature, this topic was selected for study to compare this two commonly performed surgeries based on some important per -operative & post -operative parameters.

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Materials& methods:

This case control study was carried out in the department of Otolaryngology & Head - neck surgery, Dhaka Central International Medical College Hospital, Dhaka. The study was started in July 2018 & completed in November 2019. As it was a hospital based study patients between the age of 16 & 45 years of 40 patients having a history of recurrent tonsillitis, not completely achieved by medical management were selected in random fashion from the out patients department of Otolaryngology. Out of 40 patients, 20 patients underwent for cold steel method and other 20 underwent bipolar diathermy method. Patient were randomly chosen for either of the two. All the surgeries were performed in the same institution & by a single surgeon under general anesthesia. The assessment of main outcome measure was done during the procedure in the operation theatre & postoperatively. Silk no 2 suture was used for the purpose of hemostasis during tonsillectomy by dissection method. For collecting the data with questionnaire was designed in English language & questions were asked in patient's local language & then after translation, the data was recorded in the questionnaire. Patient were followed up for the assessment 12 hours, 24 hours & after one week interval. The variables and mean outcome measures were operative time, intraoperative bleeding, postoperative pain. The operative time was the duration between the insertion of the of the mouth gag up to the end of procedure. Intraoperative blood loss was assessed by measuring the suction bottle content & weighing the swabs that were soaked during tonsillectomy. Postoperative pain was assessed by visual analogue scale & verbal analogue scale. Same analgesics in dosage adjustment for body weight was given per operatively & post operatively. Per operative hydrocortisone injection was given to all patients. Adequate hydration maintained in per operative & postoperative period for all patients. Patients were encouraged for oral feeds after 3 hours operation & standard postoperative care is given to all patients.

The data collected from the patients were finally into the SPSS version -16 for the purpose of analysis. To evaluate the significance of differences in the results test of significance was applied. For this a statistical test known as `Fischer's Exact Test' was applied keeping in view the type of data & form & the results obtained.

Results:

Out of 40 patients, 26 (65%) were male & 14 (35%) were female (Table-I). Among the age of patients (16-45 years) most of them were in the range of 16 – 20 years (65 %) (Fig-I).

Regarding operating time for dissection method, the maximum duration of time taken for surgery was 80 minutes & the minimum was 45 minutes while considering the operative time for diathermy method, the maximum duration of time taken for surgery was 26 minutes and minimum was 12 minutes. The mean duration of surgery for cold steel method was 61 (5.1) min which was significantly higher than the diathermy method 16.3 (1.7) min (p value < .0001)

The amount of blood loss during cold steel method was 58 (3.67) ml which is significantly higher (p value <.0001) than diathermy method 15.5 (1.39) ml (Table-III). In case of postoperative pain assessment by using VAS score the patient who underwent tonsillectomy by bipolar diathermy, postoperative pain was much higher than the patients of cold steel dissection method (Table-IV).

Discussion:

Tonsillectomy is one of the most commonly performed surgery in Otolaryngology department worldwide. Although it is usually performed on the pediatric population, a significant proportion of adults also undergo the procedure[7]. Various method have been described which are frequently compared & discussed in the literature.Advocates of cold dissection tonsillectomy have presented evidence that this method is less morbid in terms of rapid healing & less postoperative pain as compared with other technique[8].

This is thought to results from maximum preservation oral mucosa & minimum damage to tissues when mechanical rather than thermal effects are used for dissection. Healing following a tonsillectomy is by epithelial ingrowth from the incised edges of the anterior&posteriortonsillar pillars. Large tissue defects & thermal damage to the pillar mucosa can thus delay healing & increase the postoperative pain. This observation is also made in this study. However, these facts were unproven in the study of Raut & colleagues & they recommended the use of bipolar diathermy for tonsillectomy[9].

Saleh HA & Cain AJ compared these methods of tonsillectomy & found diathermy to be safe & short without causing increase postoperative morbidity[10]. This is in accordance with the result of the study.

The duration of surgery was shorter in bipolar diathermy tonsillectomy group & can be due to the fact that bipolar diathermy is associated with less amount of blood losing from the tonsillar fossa as compared to dissection method thus making surgical field relatively clean for surgeon to perform the procedure quickly & there is reduced used of putting the swabs in the tonsillar fossa & changing them for clarity of vision as routinely done in dissection method & hence there is lesser duration of time consumed. Because of the fact that the area of coagulation is relatively localized in diathermy, the bleeding vessels can be precisely coagulated. Considering the intraoperative hemorrhage, it was found that diathermy method tonsillectomy associated with reduce amount of blood loss as compared to dissection method tonsillectomy. This observation supported by the study showed that the amount of intraoperative blood loss is less as compared to dissection method tonsillectomy[11].The increased amount of intraoperative blood loss can be attributed to the fact that during tonsillectomy dissection method, the plane of dissection can be difficult to visualize due to bleeding or the swabs hampering the vision thus leading injury to the pharyngeal musculature while in bipolar diathermy method , the area of tissue coagulation is localized to that between fine tips of the diathermy forceps. It should therefore cause less tissue damage & the dissection of capsule & the coagulation of vessel is more precise[2].

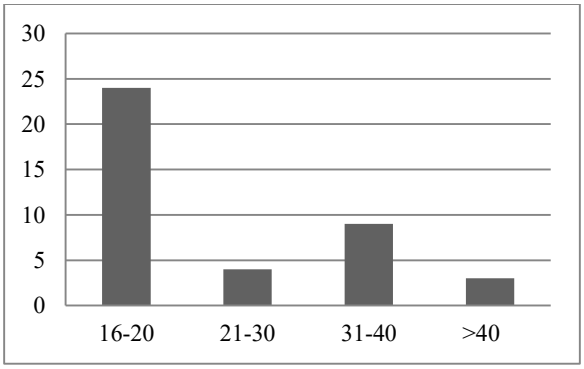
So at the end of the discussion it can be stated that the use of bipolar diathermy for tonsillectomy operation give satisfactory results in term of intraoperative blood loss, surgical time but the recovery hampered by increased postoperative pain are the factors which should be taken into account before choosing the technique of tonsillectomy.

The study consists of only forty patients which are the limitation of this study.

Table- I: Sex distribution of patients.

Sex	No. of patients	Percentage (%)
Male	26	65%
Female	14	35%

Fig-1:Distribution of cases according to age (16.45)



Table–II:Comparison of duration of tonsillectomy.

Method of tonsillectomy	Duration of tonsillectomy (in minutes)	P value
Cold steel dissection	61 ± 5.1	<0.0001
Bipolar diathermy	16.5±1.7	

Table- III: Comparison of intraoperative blood loss (in ml).

Method of tonsillectomy	Intraoperative blood loss (ml)	P value
Cold steel dissection	58 ± 3.67	<0.0001
Bipolar diathermy	15 ± 1.39	

Table: IV- Assessment postoperative pain after tonsillectomy.

Time of assessment	Tonsillectomy method	
	(Cold steel dissection)	(Bipolar dissection)
After 12 hours	16 (80%)	19(95%)
After 24 hours	8(40%)	17(75%)
7th postoperative day	1(5%)	7(35%)

Conclusion:

On the basis of this study & its results, it can be concluded that use of diathermy for tonsillectomy reduce the operative time & amount of blood loss but on the other hand, there is significant increase in postoperative pain in comparison to cold steel dissection method.

But all surgeon should be familiar with the cold steel method to prepare themselves for diathermy instruments failure or bleeding from deep vessels.

References:

1. Curtin JM history of tonsil & adenoid surgery. Otolarygol clin north Am 1987, 20:415 - 9.
2. Hall G M. cautery tonsillectomy saves times. Larygoscope 1984; 94: 1381 – 2.
3. Cohen L. postoperative tonsillar bleeding its surgical control, with mention of cases. J Am Med Assoc. 1909 ;53: 698-6.
4. Haase FR , Noguera JT, Neptune NJ. Hemostasis in tonsillectomy by electrocautery. Arch otolaryngol 1962; 75: 125-6.
5. Johnson F. Electrocautery in tonsil & adenoid surgery. Arch otolarygol 1962 ; 75: 127-9.
6. Reed K, Snider CJ. Bipolar forceps for electrocautery in tonsillectomy.Trans Am Acade opthalmol Otolaryngol 1974;78 : OPL 285-6.
7. I yildirim, E Okur, P Ciragil, M Aral, M.A Kilic, M Gul. Bactereamia during tonsillectomy. J Laryngol Otol 2003; 117: 619-23.
8. Saleh HA, Cain AJ Mountain RE. Bipolar scissors tonsillectomy. Clin Otolaryngol Allied Sci 1991; 24: 1 9.12.
9. Raut VV, Bhat N, Sinnathuray AR, Kinsella JB, Stevenson M, Toner JG. Bipolar scissors versus cold dissection for pediatric tonsillectomy – a prospective randomized pilot study. Int J pediatric Otorhinolaryngol 2002; 64: 9-15.
10. Saleh HA, Cain AJ, Mountain RE. Bipolar scissors tonsillectomy. Clin Otolaryngol Allied Sci 1991; 24: 9-12.
11. Leach J, Manning S, Schaefer S. Comparison two methods of tonsillectomy. 1993; 103: 619-22.

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Review Article
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Urinalysis: an Evergreen Issue in Nephrology

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Abstract:

To many nephrologists, urinalysis is equivalent to liquid renal biopsy for evaluation of kidney disease. This should always be done at first visit by kidney disease specialist. For urine microscopy, a midstream sample of first voided morning urine is recommended. Strenuous physical activity should be avoided for at least 24 hours before the urine sampling. Sample should be examined within 3 hours from collection. If this is not possible, specimens should be refrigerated at 4°C to 8°C. Urine refrigerated for more than 24 hours should not be used for "Culture". Bacteria and pus cells without proteinuria are the hallmarks of UTI. Associated findings are isomorphic RBCs and transitional epithelial cells. Most important differential is acute interstitial nephritis (AIN). In patients with AKI with nil to (+) proteinuria, the presence of renal tubular epithelial cells (RTECs), epithelial casts and granular casts is the hallmark of acute tubular necrosis (ATN). In active proliferative glomerulonephritis, the hallmark findings are (+) to (++++) proteinuria, dysmorphic RBCs and RBC casts and sometimes hemoglobin casts. Thus correlation with different parameters of urine and other blood and urinary results always aid in discovery of more appropriate diagnosis and management.

Keywords: Urinalysis, sampling, cells, casts, crystals.

Introduction:

It is said that urinalysis is liquid renal biopsy for evaluation of kidney disease. This should always be done at first visit by kidney disease specialist. Reagent strips are still the most widely used method, but they are not free of limitations. Urine sediment examination is the core part of urinalysis[1]. This should ideally be done by nephrologist, for better correlation of clinical information and laboratory findings.

Sampling of urine:

The early morning urine sample is suggested by the Kidney Disease: Improving Global Outcomes (KDIGO) guideline[2]. For urine microscopy, a midstream sample of first voided morning urine is recommended, as this urine is the most concentrated and acidic with preserved particles.

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However prolonged residence of urine in the bladder may cause disintegration of cells and casts, leading to false-negative results. For this reason, many centers use second morning urine for dipstick and urine microscopy[3].

Strenuous physical activity (e.g., running, sexual intercourse) should be avoided for at least 24 hours before the urine sampling to avoid exercise-induced proteinuria or hematuria. In women, urinalysis must be avoided during menstruation. To evaluate orthostatic proteinuria, one sampling should be done while patient had been on supine position and another sampling while patient has been standing for few some hours.

However, the 24-hour urine collection is still important for evaluation of multiple parameters, like protein, sodium, potassium, calcium, etc. Improper collection and missed samples can lead to erroneous report. Errors can be minimized by giving the patient clean written instructions. Discard the first urine sample at 8:00 am of the day, then collect all the urine produced in an at least 3 L graduated container, till passed at 8:00 am of the next day and carefully record the volume.

Collection of midstream urine (MSU) for investigation:

Early morning urine samples are preferred. Use the sterile screw-lid 50 ml (at least) urine container provided by the laboratory. The steps of sampling are-

Step 1: Wash and dry your hands thoroughly.
Step 2: Remove the lid on the container and set it aside. Do not touch the inner surface of the lid or the container.
Step 3: For women, keep the legs apart and hold the skin folds apart while voiding. For men, retract the foreskin (if uncircumcised) while voiding.
Step 4: Clean genital area with tissuepaper prior to voiding
Step 5: Pass a small amount of urine into the toilet.
Step 6: Midway through urination, fill the container to half full.
Step 7: Finish voiding in the toilet.
Step 8: Replace the lid and tighten firmly.
Step 9: Wash and dry your hands thoroughly after collection.
Step 10: Label the container with the patient's name and other information.

Sample should be examined within 3 hours from collection as cells and casts can be disintegrated rapidly. If this is not possible, specimens should be refrigerated at 4°C to 8°C. But refrigeration causes precipitation of phosphates and urates and hampers further examination. Urine refrigerated for more than 24 hours cannot be used for "Culture".

Urine collection procedure in indwelling catheterized patient:

In special situations, urine sampling can be done through an indwelling catheter, with a risk of hematuria. Long standing indwelling catheters are associated with bacteriuria, pyuria, hematuria, and candiduria. A suprapubic bladder puncture may occasionally be necessary. Urine should not be collected from drainage bag. The steps of sampling are-

Step 1: Clean the catheter collection port with a 70% alcohol wipe.
Step 2: Use a sterile needle and syringe to puncture the collection port.
Step 3: Aspirate the urine directly from the tube.
Step 4: Transfer the urine to a sterile specimen container.

Physical examination:

Color: The normal color of urine may be straw to dark yellow, depending on the concentration of the urobilinogen. Changes in color can be caused by pathologic conditions, drugs, or foods.

The most common pathologic conditions that can cause high or dark color urine are gross hematuria, hemoglobinuria, myoglobinuria, bilirubinuria, massive urate crystalluria. Other causes are UTI with Klebsiella, Proteus, Escherichia coli or Enterococci (purple color). Less common causes are chyluria (milky white), porphyrinuria, and alkaptonuria (dark red to black on standing).

The main drugs responsible for abnormal urine color are rifampin (orange to red urine); nitazoxanide (golden yellow), phenytoin (red urine); chloroquine and nitrofurantoin (brown urine); metronidazole, alfa-methyldopa, imipenem-cilastatin, iron injecton (dark brown urine on standing).

The main foods responsible for abnormal color are beetroot (red urine), senna (laxative) and rhubarb (yellow or brown or red urine), and carotene (brown urine), dragon fruit (pink to red), starfruit (green urine).

Turbidity: Normal as well as pathological urine may be transparent. Urine can be turbid because of a high concentration of cells, crystals, and bacteria. The most frequent causes of turbidity are urinary tract infection (UTI) and genital secretions.

Odor: Some foods like onion, garlic, coffee, asparagus and curry may contain certain substance those may produce strong smell in urine when consumed in sufficient amount. A pungent odor is typical for most bacterial UTIs due to production of ammonia. There is often a sweet odor in urine from ketone bodies.

Specific gravity (SG):

SG refers to the comparison of weight of urine with distilled water. It depends on the dissolved particles. SG is most frequently evaluated by reagent strip which underestimates when urinary pH is >6.5, and overestimates when urine protein is >7.0 gm/L.

For SG, refractometry is more accurate than reagent strips. Urine SG of 1.010 (read 1010) is similar to plasma and often called isosthenuric urine. It is often observed in acute tubular necrosis (ATN) and chronic kidney disease (CKD) where urinary concentrating ability is impaired. SG of 1.000 to 1.003 (read 1000 to 1003) is seen with marked urinary dilution with diabetes insipidus or water intoxication. SG above 1.040 (read 1040) indicates the presence of some extrinsic osmotically active agent, such as radiocontrast.

Osmolality:

Osmolality of urine is measured by osmometer and depends on number of particles and high glucose concentrations and not influenced by protein in urine. Measurement of osmolality is therefore more reliable than SG.

Chemical analysis:

Chemical analysis of urine is frequently done by reagent strips. The strip bears several pads for detecting SG, pH, hemoglobin, glucose, albumin, leukocyte esterase, nitrites, bile pigments, and ketone bodies. Reagent strips have the advantages of simplicity, low cost and quick reports (within 2 to 3 minutes). Disadvantages include semiquantitative results, interference by urinary substances and discoloration.

Urinary P^H:

Significant deviations of urinary pH are observed for <5.5 and >7.5. Urine pH reflects the presence of hydrogen ions (H^+). But this does not reflect the acid load in the urine because most of the acid is excreted as ammonia. Low pH is often observed with metabolic acidosis (with acid secretion), high protein meals (with more acid and ammonia production), and volume depletion (with high aldosterone mediated acid rain).

High pH is often observed with vegetarian diets, renal tubular acidosis and UTI with urease-positive organisms (producing ammonia from urea). Measurement of urine pH is also needed for a correct interpretation of other urine parameters e.g., SG, albumin and crystalluria.

Hemoglobinuria:

Hemoglobin in urine is detected by a dipstick. The most important causes of false-positive results are myoglobinuria and a high concentration of bacteria with pseudoperoxidase activity (Enterobacteriaceae, Staphylococci, and Streptococci.).False-negative results are most frequently caused by high SG or by ascorbic acid (vitamin C), a strong reducing agent[4].

Glycosuria:

The reagent strip detects glucose in urine ranging from 0.5 to 20 g/L. When more precise quantification of urine glucose is needed, enzymatic (hexokinase) method must be used. False-negative results for glucose occur in the presence of ascorbic acid and bacteria. False-positive findings may be observed in very acidic urine pH. SGLT-2 inhibitors frequently cause glycosuria even with normal blood glucose level.

Proteinuria:

In healthy persons proteinuria does not exceed 150 mg/24 hours for adults and 140 mg/m^2 for children. 2 Proteinuria may be evaluated by 3 different approaches.

Dipsticks:

When a test strip is saturated with fresh sample of urine, it changes color to indicate the presence of proteins. It is less sensitive but highly specific for proteinuria.

The strip is sensitive to albumin but has a very low sensitivity to other proteins, such as tubular proteins and light-chain immunoglobulins. Therefore it will not detect tubular proteinuria or overflow proteinuria with monoclonal gammopathies. Moreover, it cannot identify microalbuminuria (albuminuria 30 to 300 mg/L).

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Negative means 0 to < 15 mg/day,
Trace means 15 to <30 mg/day,
1+ means 30 to < 100 mg/day,
2+ means 100 to < 300 mg/day
3+ means 300 to < 1000 mg/day
4+ means 1000 mg/day or more.

24-Hour Protein Excretion:

The 24-hour protein excretion is considered the reference method. Because it averages the change of proteinuria caused by circadian rhythm. The measurement of proteinuria quantifies total proteins, not only albumin. However, the 24-hour urine collection may be erroneous from overcollection or undercollection in children, outpatients, elderly patients[5].

Protein/Creatinine Ratio (PCR) on spot/random urine sample:

The protein/creatinine ratio (PCR) measured in early morning urine sample is an alternative to the 24-hour urine collection. Because that sample is not influenced by variation in water intake or rate of diuresis. The PCR is measured by the ratio of urinary protein excretion and creatinine excretion in milligrams per milligrams or millimole. A close correlation between the PCR and the 24-hour protein excretion has been demonstrated in a wide range of patients. (See Table 1) PCR values can be higher by reduced creatinine excretion from low muscle mass in elderly and female patients.

However, a higher PCR should be confirmed and quantified with a 24-hour urine protein excretion. KDIGO recommends PCR for patients with glomerulonephritis (GN) and congenital disorders with non-albumin proteinuria[2].

Table-1:Protein excretion rate (PER) and its significance:

PCR (gm protein/gram creatinine in urine sample)	Dipstick Results	Significance
< 0.2	Negative	Normal
0.2 to 0.5	Negative	Elevated proteinuria. Patient needs follow-up.
0.5 to 1	+ to ++	Overt proteinuria
1 to 3.5	++ to +++	Glomerular disease more likely (UTP >1 gm/day)
>3.5	+++ to ++++	Almost always glomerular disease. Nephrotic range proteinuria (UTP >3.5 gm/day)

Specific Proteins:

Albuminuria may be mild, moderate or severe. In diabetic nephropathy, abnormal albuminuria is correlated with a risk for progressive renal dysfunction. In non-diabetic patients, albuminuria is correlated with increased risk for CKD, cardiovascular morbidity, and all-cause mortality[6]. When reagent strip for albuminuria is positive, a quantitative method must be used for confirmation.

Tubular proteins:

Such as α1-microglobulin, β2-microglobulin and retinol-binding protein should be measured when an isolated tubular lesion is suspected. This can be done by urine protein electrophoresis.

Bence Jones proteinuria:

Indicates the presence of free heavy or light chains, kappa or lambda chain with monoclonal gammopathies. Bence Jones proteinuria is detected by urine protein electrophoresis. Free light chain assay or kappa and lambda chain detection requires urine immunofixation[7].

Leukocyte esterase:
Dipstick test suggests the presence of esterase from disintegrated neutrophils. Leukocyte esterase may be positive without significant pus cells when leukocytes are lysed, due to delayed examination, dilute urine, alkaline pH. False-positive results may be obtained from meropenem, imipenem or clavulanate, abnormal colored urine.

Leukocyte esterase may be negative with significant numbers of pus cells from high glucose (≥20 g/L), or high protein (≥5 g/L), concentrated urine or antibiotics, such as tetracycline, tobramycin or cephalexin or ascorbic acid in urine. Therefore, different types of antibiotics can cause false positive or false negative leukocyte esterase dipstick test[4].

Dipstick nitrites test:
Detects bacteria that reduce nitrates to nitrites by nitrate reductase activity. This includes most gram-negative uropathogenic bacteria, except Pseudomonas, or Enterococci. False-negative results also may occur on vegetarians (low nitrate concentration) and short bladder incubation time. Thus, the sensitivity of the dipstick nitrites test is low, whereas specificity is high. False-positive results may occur in abnormal colored urine.

Ketones:
The ketone dipstick tests can detect ketone bodies, which are excreted into urine in diabetic ketoacidosis (DKA), prolong fasting, vomiting, or strenuous exercise.

Urine microscopy:
Now-a-days, urine microscopy is carried out in clinical laboratories, where the lack of clinical information and clinico-laboratory correlation may have a negative impact on diagnosis and management of renal patients[4].We believe urine microscopy remains a fundamental skill for nephrologists.

Method of urinalysis:
The patients are instructed to deliver the second morning urine specimen. The use of phase-contrast microscopy is recommended, because it improves the identification of cells and casts. Polarized light microscopy is mandatory for the correct identification of lipids and different crystals[3].

At least 20 microscopic fields should be examined at low power field (LPF: ×100 or ×200) and high power field (HPF: ×400). More extensive examination may be required in certain clinical conditions, such as microscopic hematuria of unknown origin. 50 LPF may need to be examined for RBC casts. For correct examination, both pH and SG of urine must be known. Both alkaline pH (≥7.0) and low SG (≤1.010) favor the disintegration of RBC and WBC, which make differences between dipstick and microscopic examination results. Alkaline pH also impairs the formation of casts. Therefore, patients are advised to drink plenty water to reduce SG and sodium bicarbonate to increase urinary P^{H}.

RBCs:
In the urine, there are two morphology of RBCs: isomorphic (regular shapes), derived from nonglomerular bleeding; and dysmorphic (irregular shapes), which are of glomerular bleeding.RBC dysmorphism is thought to result from passing through gaps in the glomerular basement membrane and physicochemical insults in the tubular system.

The distinction between glomerular and nonglomerular hematuria is important to decide whether nephrologic or urologic investigation is needed further.

In glomerular hematuria 40 to 80% of erythrocytes are dysmorphic. With this approach, a good correlation was found between urinary active sediment and kidney biopsy findings with long-standing isolated microscopic hematuria[8].

WBC/Leukocytes:
Neutrophils are identified in urine by their granular cytoplasm and lobulated nucleus. In most patients, neutrophils indicate UTI, contaminated urine by genital secretions, acute interstitial nephritis (AIN), chronic interstitial nephritis (CIN) and in proliferative GN[9]. Eosinophils can be identified by Hansel stain and is a marker of acuteallergic

interstitial nephritis, various types of GN, prostatitis, chronic pyelonephritis and cholesterol embolism[10]. Lymphocytes in urine may indicate acute cellular rejection in renal allograft recipients and chyluria. Macrophages may be engorged with lipid drops, appearing as oval fat bodies in nephrotic syndrome and active GN.

Renal Tubular Epithelial Cells (RTEC):

RTECs derive from the exfoliation of the tubular epithelium. They are found in acute tubular damage, including ATN, AIN and acute cellular rejection[9, 11]. They also can be found in glomerular diseases in smaller numbers. In ATN, these cells are frequently be present in epithelial casts.

Transitional Epithelial Cells (TECs):

TECs derive from the exfoliation of the uroepithelium. The epithelium from deep layers are smaller and from superficial layers are larger. Presence of deep layer cells suggests severe uroepithelial damage due to neoplasia (TCC), stones, obstructive uropathy, long-standing bladder catheters or DJ stents.

Squamous Epithelial Cells (SEC):

SECs derive from the urethra or from the external genitalia. Small number of SECs in urine is a normal finding, but large number cells indicate urine contamination from genital secretions and improper urine collection.

Lipids:

Urine lipids are spherical, translucent, yellowish drops or clusters, free or casts. Lipids are typically found in glomerular diseases associated with marked proteinuria. In Fabry disease, urine sediment may contain fat particles even in the absence of proteinuria.

Casts:

Casts are cylindrical structures formed in the lumen of distal renal tubules and collecting ducts. Their matrix is made of Tamm-Horsfall protein or uromodulin, secreted by the cells of ascending limb of loop of Henle.

Trapping of particles within the matrix protein results in casts formation. There are many types of casts, like:

- Hyaline casts: They are colorless, but easily seen with phase-contrast microscopy. Hyaline casts can be found in normal and pathologic conditions, especially in dehydration.
- Granular casts indicate kidney disease. In acute kidney injury (AKI), presence of granular casts, RTECs or epithelial casts, are indicative of ATN[11].
- Waxy casts appears like melted wax. They are typically found in patients with kidney disease associated with reduced GFR[12].
- Fat casts contain variable amounts of lipid drops. Fat casts are typical of glomerular diseases associated with marked proteinuria.
- RBC casts may contain variable number of RBCs. RBC casts are a marker of renal bleeding of glomerular origin. They have also been found in AIN[9].
- Hemoglobin casts appear brownish and granular, derived from the degradation of RBCs in the cast matrix. Hemoglobin casts is derived from hemoglobinuria in intravascular hemolysis. These hemoglobin casts also have the same clinical significance of RBC casts.
- Myoglobin casts are cylinders pigmented by myoglobin, akin to hemoglobin casts. Myoglobin casts are observed in AKI associated with rhabdomyolysis.
- WBC casts contain polymorphonuclear leukocytes. They can be found in acute pyelonephritis, AIN and active proliferative GN[9].
- Renal epithelial casts contain variable numbers of RTECs. They indicate damage of the renal tubular epithelium and can be found in ATN, AIN and glomerular disease[9, 11.]

- Casts may contain microorganisms (bacteria and yeasts), which is indicative of kidney infection.

Crystals:

Crystals are best observed on the first voided morning urine samples, that are the most concentrated. Clinically significant crystals are 3 types: common crystals, pathologic crystals and drug induced crystals.

Common Crystals:

Calcium oxalate crystals: There are two types of calcium oxalate crystals: bihydrated and monohydrated. Monohydrated crystals are birefringent under polarized light, whereas bihydrated crystals are not. Both types precipitate at acidic urine and dissolve in alkaline urine.

Calcium phosphate crystals: Calcium phosphate crystals are pleomorphic, appearing as prisms, star- or needle-like, that are strongly birefringent under polarized light. Rarely, calcium phosphate can appear as plates that do not polarize light. Both types of crystals precipitate in alkaline urine.

Triple phosphate crystals: These crystals contain magnesium ammonium phosphate and classically have pyramid or coffin lids. But flower-and scissors-like structures also can be found. These crystals polarize light strongly and are found in alkaline urine.

Uric acid crystals: These crystals appear as rhomboidal, needle-like or barrel-like structures with a typical yellow amber color (Fig. 4.4A)[13]. Under polarized light, uric acid crystals are strongly birefringent. They are precipitated in acidic urine (pH 5.0–5.8).

Pathologic crystals:

Cholesterol crystals: They appear transparent thin plates with sharp edges, which do not polarize light.

Cystine crystals:

These are heaped hexagonal plates with irregular sides. They are insoluble in a urine pH up to 7.4. Their presence is pathognomonic for the autosomal recessive condition cystinuria. Their persistent presence in urine is a risk factor for stone formation[14].

Drug induced crystals:

Several drugs can cause crystalluria. This happens in drug overdose, dehydration, low albumin in blood, reduced kidney function, crystallization pH. Drugs that can cause crystalluria include antibiotics like, amoxicillin (Fig. 4.4I), ciprofloxacin, ceftriaxone, sulfamethoxazole; antivirals like, acyclovir, indinavir, atazanavir; and DMARD like, sulfasalazine, methotrexate; many other drugs like, orlistat, intravenous vitamin C[1,3,6].

Clinical significance of crystals:

Uric acid, calcium oxalate, and calcium phosphate crystals may reflect transient supersaturation of the urine after taking some foods (e.g., meat for uric acid, spinach or chocolate for calcium oxalate, milk or cheese for calcium phosphate) or mild dehydration. However, hypercalciuria, hyperoxaluria, or hyperuricosuria may cause persistent crystals in urine. In calcium stone formers, the evaluation of crystalluria is an important tool to assess disease activity.

Uric acid crystals may be associated with AKI with acute urate nephropathy. Calcium oxalate crystals may be associated with AKI from ethylene glycol intoxication. Triple phosphate crystals are usually associated with UTI, by urea-splitting microorganisms such as Proteus, Ureaplasma urealyticum. Cholesterol crystals are found in association with marked proteinuria. Cystine crystals are pathognomonic of cystinuria. Crystalluria may be asymptomatic or associated with hematuria, obstructive uropathy, or AKI from precipitation in renal tubules[15].

Organisms:

High numbers of bacteria with WBCs are a marker of UTI. However, the concomitant presence of high numbers of squamous epithelial cells and/or Candida albicans and/or Trichomonas vaginalis suggests urine contamination from genital secretions.

Candida albicans is an ovoidal yeast frequently found in urine. It may have one or two protruding buds of variable size.

Trichomonas vaginalis is a flagellated protozoon at the two extremities of the body. They have quick and rotating movements through the slide.

Contaminants:

A large number of particles can contaminate urine. These particles may come from the normal person as well as from patient, e.g., spermatozoa, RBCs from menstruation; WBCs from vaginitis, and fungal spores and hyphae from the genitalia skin[3].

Interpretation of urine sediment findings:

Examination of the urine sediment, with the knowledge of proteinuria and other urine and blood findings, aids in diagnosis of urinary tract diseases.

In patients with AKI with nil to (+) proteinuria, the presence of RTECs, epithelial casts and granular casts is the hallmark of ATN[11]. These elements are rarely found in prerenal AKI[11]. Depending on aetiology of the tubular damage, other elements can be seen, e.g., high numbers of dysmorphic RBCs and RBC casts in active proliferative GN; myoglobin casts in AKI from rhabdomyolysis; and massive amounts of uric acid crystals in acute urate nephropathy from tumor lysis syndrome.

Acute interstitial nephritis (AIN):

In AIN, the most frequent findings are nil to (+) proteinuria, variable numbers of pus cells and isomorphic RBCs. RTECs may also be present, together with WBC casts, and/or RBC casts[9].

Active proliferative GN:

In active proliferative glomerulonephritis, the hallmark findings are (+) to (++++) proteinuria, dysmorphic RBCs and RBC casts and sometimes hemoglobin casts. Usually, the number of RBCs ranges from 30 to 40 cells/hpf. More than100 RBCs/hpf are found in necrotizing GNs. 30 to 40 pus cells/hpf may be seen in acute post-infectious GN (PIGN) or active proliferative lupus nephritis (LN).The associated findings are epithelial, hyaline, granular, waxy and WBC casts. In patients with massive proteinuria, fat particles can be seen.

Nephrotic syndrome:

In nephrotic syndrome, proteinuria is (+++) to (++++). The hallmark findings are fat particles, high number of casts (fat, epithelial, granular, hyaline casts). Dysmorphic RBCs are totally absent in minimal change disease, may be low to moderate numbers (up to 20–30/hpf) in membranous nephropathy and FSGS.

Urinary tract infection:

Bacteria and pus cells without proteinuria are the hallmarks of UTI. Associated findings are isomorphic RBCs and transitional epithelial cells. In patients with pyelonephritis, epithelial cell casts and WBC casts can also be found. When the infection is caused by urease-producing bacteria such as Proteus, triple phosphate crystals are often present. The presenceof bacteria and pus cells, together with a plenty squamous epithelial cells is suggestive of contamination of urine.

BK virus infection:

The KDIGO guideline for renal transplant recipients recommends monitoring for BK virus (BKV) reactivation by measuring viral nucleic acid in the blood. An alternative approach is looking for “decoy cells” in urine that has satisfactory diagnostic accuracy. Decoy cells can be easily identified by phase-contrast microscopy in routine unstained samples. The findings of decoy cell casts and macrophages indicate BKV nephropathy. This should be confirmed by BK viremia[16].

Urologic diseases:

Urinary tract disorders such as cancer, stone disease, and hydronephrosis are associated with low to high numbers of isomorphic RBCs, WBCs or deep, superficial or atypical transitional epithelial cells and crystals for urolithiasis. In neoplasia of excretory urinary system or uroepithelial cancer, atypical or malignant transitional cells can be found[17].

Automated urinary analyzer:

In automated urinary analyzers several hundreds of urine samples can be analyzed daily. 3 types of automated instruments are available: flow cytometry, automated intelligent microscopy, and cuvette-based microscopy.

Flow cytometry supplies quantitative results and graphics of the particles. Automated intelligent microscopy supplies quantitative results and images of the particles e.g., RBCs, WBCs. Cuvette-based microscopy supplies high-quality grayscale images of elements.

Automated urine sediment analyzers offer several advantages over manual microscopy: 1 to 3 mL of urine is sufficient; up to 130 samples can be examined in an hour; elimination of thedisadvantages of sample centrifugation (e.g., time consumption, disintegration of cells, casts and crystals); and quantitative results. However, auto analyzers are not free from limitations. They cannot identify different types of pathologic casts, lipids, RTECs and transitional cells, decoy cells, and malignant cells. For these reasons, automated urinary analyzer cannot still replace manual microscopy for urinalysis[18].

Conclusion:

The renal physician should always be very much thorough in urinalysis report. Correlation with different parameters of urine and other blood and urinary results always aid in discovery of more appropriate diagnosis and better management of the patients.

References:

1. Becker GJ, Garigali G, Fogazzi GB. Advances in urine microscopy. Am J Kidney Dis. 2016;67:954–964.

2. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney Int Suppl. 2013;3:1–150.

3. Fogazzi GB. The Urinary Sediment: An Integrated View. 3rd ed. Milan: Elsevier; 2010.

4. Lee W, Kim Y, Chang S, et al. The influence of vitamin C on the urine dipstick tests in the clinical specimens: a multicenter study. J Clin Lab Anal. 2017;32(5).

5. John KA, Cogswell ME, Campbell NR, et al. Accuracy and usefulness of select methods for assessing complete collection of 24hour urine: a systematic review. J Clin Hypertens. 2016;18 (5):456–467.

6. Dimopoulos MA, Kastritis E, Terpos E, et al. International Myeloma Working Group recommendations for the diagnosis and management of myeloma-related renal impairment. J Clin Oncol. 2016;34(13):1544–1557.

7. Fogazzi GB, Edefonti A, Garigali G, et al. Urine erythrocyte morphology in patients with microscopic haematuria caused by a glomerulopathy. Pediatr Nephrol. 2008;23:1093–1110.

8. Fogazzi GB, Ferrari B, Garigali G, et al. Urinary sediment in acute interstitial nephritis. Am J Kidney Dis. 2012;60:330–332.

9. Muriithi AK, Nasr SH, Leung N. Utility of urine eosinophils in the diagnosis of acute interstitial nephritis. Clin J Am Soc Nephrol. 2013;8:1857–1862.

10. Hall IE, Coca SG, Perazella MA, et al. Risk of poor outcomes with novel and traditional biomarkers at clinical AKI diagnosis. Clin J Am Soc Nephrol. 2011;6:167–174.

11. Spinelli D, Consonni D, Garigali G, Fogazzi GB. Waxy casts in the urinary sediment of patients with different types of glomerulonephritis: results of a prospective study. Clin Chim Acta. 2013;424:47–52.

12. Luciano RL, Perazella MA. Crystalline-induced kidney disease: a case for urine microscopy. Clin Kidney J. 2015;8:131–136.

13. Baroni S, Garigali G, Primiano A, Gervasoni J, Fogazzi GB. Very unusual “needle-and pencil-like” uric acid crystals in the urine unmasked by infrared spectroscopy investigation. Clin Chim Acta. 2018;479:72–73.

14. Wong KA, Pardy C, Pillay S, et al. Can the presence of crystalluria predict stone formation in patients with cystinuria? J Endourol. 2016; 30:609–614.

15. Daudon M, Frochot V, Bazin D, Jungers P. Drug-induced kidney stones and crystalline nephropathy: pathophysiology, prevention and treatment. Drugs. 2018;78(2):163–201.

16. Nickeleit V, True K, Detwiler T, et al. Risk assessment for polyomavirus nephropathy using urine cytology and the detection of decoy cells: cheap and efficient. Transplantation. 2012; 94:e42–e44.

17. Fogazzi GB, Pallotti F, Garigali G. Atypical/malignant urothelial cells in routine urinary sediment: worth knowing and reporting. Clin Chim Acta. 2015;439:107–111.

18. İnce FD, Ellidağ HY, Koseoğlu M, et al. The comparison of automated urine analyzers with manual microscopic examination for urinalysis automated urine analyzers and manual urinalysis. Practical laboratory medicine. 2016;5:14–20.

Case Report

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Management & Outcome of a Complete Open Fracture – A Miracle

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Abstract:

Open fractures, characterized by breach in skin integrity, pose unique challenges that necessitate prompt and precise management. The management ofopen fractures continues to provide challenges for the orthopedic surgeon. The orthopedic surgeon can do miracle by reconstruction ofthe open fracture. Despite the improvements in technology andsurgical techniques, rates of infection and nonunion are still troublesome. Principle simportant in thetreatment of open fracturesare reviewed in this article.

Keywords: Fracture, reconsncetion, wound, amputation

Introduction:

A fracture is a break in the structural continuity of bone. Itmay be no more then crack, acrumpling or a splintering ofcortex; more often the break iscomplete. The resulting bone fragment may be displaced orundisplaced. If the over lying skin remain intact, it is a closed fracture; if the skin or one of the body cavities is breached, itisanopen fracture, liable to contamination and infection[1,2]. Anopen fracture is an injury wherethe fractured bone and/orfracture hematoma are exposedto the external environment viaa traumatic violation of the softtissue and skin. The skin woundmay lie at a site distant to thefracture and not directly over it.Therefore, any fracture that has a concomitant wound should be considered open until proven otherwise Urgent treatment is required as open fractures are at much greater risk of infection, and delayed healing of the bone, compared to fractures with classification systems aid the description of the openfracture injury, which may influence management or predict prognosis[3,4]. One example is the Gustilo-Anderson system which is intact skin.

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Bone infection can bedifficult to treat and in a worst-casescenario, amputation of the limbmight be required, although this isunusual. Open fractures almost always need surgery to put the bone back and hold it there while it heal, best applied after wound Type I-III in juries were first described by Gustilo & Anderson and the Type III injuries were further subdivided by Gustilo et al (see table 1)[3,5].

Gustilo-Anderson grade	Description
Type-I	Wound<1cm long, clean and limited soft tissue damage
Type-II	Wound>1cmbut<10cmlong,withoutsubstantial soft tissue damage
Type-IIIa	Enough soft tissue coverage for primary closure
Type-IIIb	Notenough soft tissue coverage, necessitating skin graft, local or free flap
Type-IIIc	Associated with an arterial injuryre quiring repair, irrespective of the degreeof soft tissue damage

Table-1: The Gustilo - Anderson Classification.

There are also scoring systemsdesigned to aid a surgeon incontemplating whether to amputateor salvage a severely injured lowerlimb, such as the Mangled Extremity Severity Score (MESS)[6] (see Table 2), Nerve Injury, Ischaemia, Soft tissue injury, Skeletal injury, Shock and Age of patient (NISSSA) score and Limb Salvage Index[7,8].

	Score	Description
Skeletal soft tissue injury	1	Lowenergy
	2	Moderateenergy
	3	Highenergy
	4	Veryhighenergy
Limb ischaemia, double the score if Ischaemia is Greater than 6th	1	Pulse reduced or absent but normal perfusion
	2	Pulseless, paresthesia, slow capillary refill
	3	Cold, paralyzed, numb
Shock	1	Systolic blood pressure always > 90 mmHg
	2	Transient hypotension
	3	Consistent hypotension
Age	1	<30years old
	2	30 to 50 years old
	3	>50 years old

Table-2: The MESS system[7]

It has been suggested that ascore of greater than or equal to 7 is predictive of amputation with nearly 100% accuracy.

The success rate of reconstruction surgery can vary based on severalfactors, including the nature and extent of injury, the patient'soverallhealth, the surgeon's skill, and thepostoperative rehabilitation. Generally hand reconstruction surgeries have a high success rate, of ten leading to improved function and quality of life for patient

Casere port:

A 34 years old male patient, non-diabetic, normotensive, marriedMuslim, napkin factory worker camewith complaints of machinery injury of right up perarm.While working, Hisright arm stuck in machine and wasinjured during manually removal ofstuck napkins from out flow chamber of napkin cutting machine.

Immediately, other available staff tiedsome clothes over the injured area and rushed into the trauma center. At trauma center he was treated with injectable analgesics and PPI with suggestion of amputation of injured arm as arm can't be saved. The patient attendant refused for amputation so, he was referred to DMCH (Dhaka Medical College and Hospital). There he was treated with same drug and advice and referred to NITOR. In National Institute of Traumatology and Orthopedic Rehabilitation he was advice withsame medication and amputation ofinjured arm the patient at tendantagain refused for the amputation.

Then they came to DCIMCH emergency department and admitted for further management after receiving, the patient was ill ooking severely anemic, pulse was 125 beats/min, bloodpressure 90/50mm of Hg temperature 99°F, respiratory rate 28 breath/min, and SPO2 saturation 92%RA,



Figure-1: The picture when patient was recived.



Figure-2: X-ray of the upper arm showing huge sepration of fracture humerus.

On local examination there was complete separation of SCT, muscles,bone of proximal right humerus, onlysmall portion of skin was attached, brachial artery median and ulnar nerve were intact. Skin sensation was lost along the right sided brachial, radial, ulnar pulse were low volume.

Investigation of CBC RBS, Blood Grouping,s. Creatinine, S.electrolyte and Xray of right arm both view were done. On CBC report HB% - 8.4gm /dl, total RBCcount- 4.04 million/cmm, RBS-8.4mmol/L, S. Creatinine-0.77mg/dl ,blood Group was Bpositive.

Surgical intervention:

An urgent multidisciplinary, examination, resuscitation and surgical management was started simultaneously.

Surgical Toileting of the wound, debridement of dead skin subcutaneous tissue, muscle, vessels followed by repair of comminuted fracture of proximal shaft of right humorous by application of external fixators, tackling of skin to over lying soft tissue application of posterior of the homers cast was done. During the operation 3 unit sofblood was transfused.



Figure-3: Stabilization of Fracture by application of external fixator.



Figure-4: After stabilization of soft tissue around the neuro vascular pedical themuscles was apposed lossely with 1-0 vicriland skin and subcutaneous tissue over lyingmuscles of that part was apposed with looselyapplied2-0proline.

Post operative management:

The patient's postoperative courseinvolved close monitoring forcomplications, including infection, neurovascular deficits, and delayed wound healing. All the vitals were under control with out any post operative complication. Additional1unit blood was transfused for correction of the anemia.postoperative care plan, including antibiotic administration, wound care and rehabilitation strategies.

After 6 month on his follow up;



Figure-5: Follow-up X-ray after application of external fixator.



Figure-6: The look of the limbafter the application of TFL free F lap.

On 28/12/2022, 2nd surgical intervention of wound excision followed by microsurgery and tension free flap for reconstruction was done (flap was taken from Tensor FasciaLata)

From 12/01/2023 to 03/02/2023 Re-adjustment of fixators under C –armguidance was done. 3rd surgery was done for Applicationof illizarov fixators from 07/03/2023to 20/072023.



Figure-7: Correction of deformity and boney allinment done with application nilizarov external fixator.



Figure-8: Fixation of bone by fixation and bone graft done with long plate and screws.

On 13/09/2023 4th surgery for internal fixation by plate and screws. And auto genous cancellous bone graft (taken from rom Rt. Iliac crest) wasdone.



Figure-9: X-ray with plateand Screws.



Figure-10: The picture after removal of ilizarov external fixator.

After operation the hand function was intact Subsequent plan of operation is tendon transfer for wrist and finger drop due to radical nerve injury.

Discussion:

The wound associated with an openfracture is commonly under estimated in its representation of the underlying soft tissue injury.The traumatic injury to the periosteum, muscle, fascia and subcutaneous tissue is often greater than expected, especially with a crushing mechanism of injury.

The management of an open fracture is often difficult. The mainstay of treatment involves timely initial debridement and irrigation of the wound[9]. The amputation rate for Gustilo grade IIIB/C open fractures can be as high as 26.8%. The main purpose of open fracture treatment is to repair bone defects and perform soft tissue reconstruction[10].

Though all open fractures are contaminated, the extent and source of contamination impacts infection rates. A large percentage of infections from open fractures are polymicrobial (20–35%)- the presence of multiple species of microorganism. Polymicrobial infections following open fracture are associated with increased antibiotic requirements and more amputations. Early antibiotic prophylaxis has been demonstrated to unequivocally reduce the risk of infection following an open fracture[11]. Irrigation with debridement helps remove contamination from open fractures and limit the risk of infection.

Reconstructive surgery is a procedure where in injured areas or defects are corrected by using flaps of tissue, skin, bone or metal work, along with underlying blood vessels or muscle to rebuild the damaged tissues. Reconstructive surgery on the upper and lower limbs is performed to improve the structural, functional and cosmetic outcomes of injured limbs[11]. Fracture and delayed union are the most common complication. Multiplesurgical intervention should have totake to make the miracal inorthopedic.

Outcome:

Open fracture was fixed with multiple surgery, soft tissue healing was wellprogressive but the bone Fracture shows the late union which was fixed by internal fixation by plate and screw. The outcome of the reconstruction surgery was very much impressive with the of wrist drop due to radial nerve damage which will be fixed by tendon transfer surgery.

Conclusion:

This comprehensive review consolidates current knowledge on the management and outcomes of comminuted open fractures, specifically Type III C fractures involving the proximal shaft of the right humerus. Insights gained fromthis analysis contribute to the evolving landscape of orthopedic trauma care, emphasizing the need for collaborative, multidisciplinary approaches to optimize patient outcomes. Further research and advancements in surgical techniques are warranted to address the intricate challenges posed by these complex fractures.

Reference:

1. Cross WW, Swiontkowski MF. Treatment principles in the management of open fractures. Indian J Orthop. 2008Oct-Dec; 42(4):377–386.

2. Apley and Solomon's system of orthopedics and trauma , Ashley Blom, David Warwick, Michael Whitehouse, 10th edition 2010, principal of fractures chapter 23 page 711.

3. Gustilo RB, Mendoza RM, Williams DN. Problems in the management of type III (severe) open fractures: a new classification of type III open fractures. J Trauma. 1984 Aug;24(8):742-6.

4. Jordan DJ, Malahias M, Khan W, Hindocha S.The Ortho-Plastic Approach to Soft Tissue Management in Trauma. 2014 Oct 31;8:399-408.

5. Gustilo RB, Anderson JT. Prevention of infection in the treatment of one thousand and twenty-five open fractures of long bones: retrospective and prospective analyses. J Bone Joint Surg Am. 1976 Jun; 58(4):453-8.

6. Johansen K, Daines M, Howey T, Helfet D, Hansen ST Jr. Objective criteria accurately predict amputation following lower extremity trauma. J Trauma. 1990 May; 30(5):568-72.

7. McNamara MG, Heckman JD, Corley FG. Severe open fractures of the lower extremity: A retrospective evaluation of the Mangled Extremity Severity Score (MESS) J Orthop Trauma. 1994; 8:81–7.

8. Russell WL, Sailors DM, Whittle TB, Fisher DF, Jr, Burns RP.Limb salvage versus traumatic amputation. A decision based on a seven-part predictive index.1991 May;213(5):473–481.

9. Prokuski L. Negative Pressure Dressings for Open Fracture Wounds. Iowa Orthop J. 2002; 22: 20–24.

10. Kang Y, Wu Y, Ma Y, Liu J, Gu J, Zhou M, et al. Primary free-flap tibial open fracture reconstruction with the Masquelet technique" and internal fixation. Injury. 2020 Dec;51(12): 2970-74.

11. Coombs J, Billow D, Cereijo C, Patterson B, Pinney S. Current Concept Review: Risk Factors for Infection Following Open Fractures. Orthop Res Rev. 2022 Nov 7:14:383-391.