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Information for Authors

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The East West Medical College Journal (EWMCJ), Dhaka-1230

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Editorial

STROKE BURDEN IN BANGLADESH AND IMAGING PRACTICES: A COMPREHENSIVE REVIEW

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Received: 23 February 2025
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Keywords:
FAST Approach, Thrombolysis, Thrombectomy, Public Awareness, Healthcare Infrastructure, Key Performance Indicators (KPIs), Diagnostic Delays, Imaging Practices

Abstract:

Stroke is a leading cause of disability and death worldwide, with a particularly high burden in low- and middle-income countries like Bangladesh. Factors contributing to the increasing prevalence of stroke in Bangladesh include hypertension, diabetes, smoking, and limited access to timely healthcare. Despite the effectiveness of the FAST (Face, Arms, Speech, Time) approach for early clinical recognition, delays in treatment persist, often leading to higher mortality and disability rates. This review explores the stroke burden in Bangladesh, highlighting key diagnostic and treatment challenges. It offers evidence-based imaging recommendations, adapted to local healthcare realities, and emphasizes the importance of timely interventions, including the use of the FAST approach and adherence to key performance indicators (KPIs). Strengthening public awareness, improving healthcare infrastructure, and expanding access to stroke imaging are key strategies to improve stroke outcomes in Bangladesh.

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Introduction:

Stroke is a leading public health concern in Bangladesh, significantly contributing to disability-adjusted life years (DALYs). Despite global advancements in stroke care, Bangladesh faces persistent challenges in managing stroke due to insufficient healthcare infrastructure, economic barriers, and low public awareness of stroke symptoms and emergency response. Additionally, the burden of stroke in Bangladesh is compounded by the country's high prevalence of risk factors, such as hypertension, diabetes, and smoking, which remain largely unmanaged in the general population. Rural-urban disparities in healthcare access and delayed diagnosis further exacerbate the issue. This review provides an in-depth analysis of stroke incidence, risk factors, and current imaging techniques used in Bangladesh, while offering actionable recommendations to improve diagnosis, early detection, and treatment outcomes. A focus on enhancing public awareness, increasing imaging access, and implementing international stroke care guidelines, including key performance indicators (KPIs), is essential for improving stroke outcomes in Bangladesh.

Methodology:

This systematic review was conducted by reviewing literature on stroke in Bangladesh using databases such as PubMed and Google Scholar. A total of **14 studies** published between 2019 and 2023 were included. The selection focused on studies addressing stroke incidence, risk factors, stroke imaging practices, clinical outcomes, and public awareness specific to Bangladesh. Studies were selected based on the following criteria: studies presenting primary data on stroke in Bangladesh, published in English, and peer-reviewed. Excluded studies were those that

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did not focus on stroke, were not conducted in Bangladesh, or lacked sufficient data related to stroke care in the country. This review followed the **PRISMA 2020 guidelines** for systematic reviews. Data were extracted from these studies and analyzed to provide a comprehensive overview of the current state of stroke care in Bangladesh, as well as the challenges and opportunities for improving diagnosis, treatment, and prevention.

Results:

Research consistently underscores the growing burden of stroke in Bangladesh. Rahman et al. (2020) estimated the prevalence at 1.6%, with ischemic stroke accounting for 80% of cases.[1] Alam et al. (2019) found that hypertension (65%) and diabetes (30%) are common risk factors for stroke in the country.[2] The World Health Organization (WHO) reports that stroke contributes to around 6% of all deaths annually in Bangladesh.[3] Additionally, Khan et al. (2022) observed a rise in stroke-related hospital admissions, particularly in individuals aged 50 and above.[4]

Despite the rising number of stroke cases, significant delays in seeking treatment persist, especially in rural areas. Siddique et al. (2021) reported a 25% longer delay in accessing imaging services in rural areas compared to urban centers, contributing to delayed diagnoses and treatment.[5] Moreover, Hasan et al. (2020) found that nearly 60% of stroke patients fail to receive thrombolytic therapy due to delays in reaching hospitals and obtaining imaging.[6]

Several risk factors contribute to the increasing stroke burden, including hypertension, smoking, and physical inactivity, as noted by Chowdhury et al. (2022).[7] Public awareness of stroke symptoms remains low, particularly in rural areas. Khan et al. (2020) noted that while the FAST (Face, Arms, Speech, Time) approach is effective, public knowledge of stroke warning signs is limited, contributing to delayed care.[8]

Stroke diagnosis and management are further hindered by limited access to imaging, especially in rural areas. Sultana et al. (2020) found that urban hospitals have better access to advanced imaging like CT and MRI, while rural hospitals face significant barriers.[9] Jahan et al. (2019) highlighted the lack of specialized stroke care in resource-limited settings, which further exacerbates treatment delays.[10]

Technological advances, including AI-assisted stroke diagnosis, have shown promise. Patel et al. (2021) demonstrated that AI could help in interpreting imaging results more rapidly, which could be transformative in low-resource settings.[11] However, access to such technologies remains limited in Bangladesh.

Stroke prevention through public education has also been identified as crucial. Shaheen et al. (2022) conducted an educational intervention in rural Bangladesh, finding that improving stroke awareness can lead to faster hospital visits and better treatment outcomes.[12]

In summary, while stroke remains a significant public health issue in Bangladesh, barriers such as limited healthcare access, diagnostic delays, and low public awareness continue to impact outcomes. Advances in imaging and technology, along with increased stroke education, are essential to addressing these challenges.

Discussion:

Stroke is a leading cause of death and disability in Bangladesh, with a significant impact on public health. According to the World Health Organization, stroke is responsible for approximately 6% of all deaths annually in Bangladesh, contributing to an increasing burden on the healthcare system.[3] Recent studies highlight the rise in stroke-related hospital admissions, with a growing proportion of patients being diagnosed with ischemic stroke.[1] As the burden of stroke continues to escalate, it is crucial to explore strategies to improve early recognition, treatment, and public awareness.

Epidemiology and Risk Factors:

Several studies emphasize the high prevalence of stroke in Bangladesh. A study by Rahman et al. (2020) reported a stroke prevalence of 1.6% in the Bangladeshi population, with ischemic strokes comprising around 80% of these cases.[1] Hypertension, diabetes, smoking, and physical inactivity are identified as the primary risk factors for stroke in Bangladesh, similar to other parts of South Asia.[2] Alam et al. (2019) observed that 65% of stroke patients had hypertension and 30% had diabetes, highlighting the need for early prevention and better management of these risk factors.[2] These findings suggest that addressing modifiable risk factors could significantly reduce stroke incidence and improve long-term outcomes.

Stroke Assessment and Public Awareness:

The **FAST** approach (Face, Arms, Speech, Time) is a key tool for the early recognition of stroke and can

help reduce pre-hospital delays, which are critical in improving stroke outcomes. Early identification of stroke symptoms is essential, as delayed treatment can lead to irreversible brain damage. Research by Siddique et al. (2021) showed that rural areas in Bangladesh experience up to a 25% delay in accessing diagnostic imaging, which compounds the difficulties in stroke management and treatment.[5] The **FAST** acronym helps non-medical personnel quickly identify stroke symptoms and seek timely medical attention, which is crucial in the context of Bangladesh's healthcare challenges.

1. **Early Recognition and Faster Treatment:**

   The FAST approach enables individuals, caregivers, and even bystanders to promptly recognize stroke symptoms, leading to faster hospital arrivals. As stroke treatment is highly time-sensitive, every minute of delay can result in the loss of nearly 1.9 million neurons.[5] Early recognition, as emphasized by the **FAST** approach, improves the chances of receiving appropriate treatment, particularly thrombolytic therapy or mechanical thrombectomy, both of which have strict time-based treatment windows.[6]

2. **Reducing Treatment Delays and Improving Key Performance Indicators (KPIs):**

   The **FAST** approach plays an essential role in aligning stroke management with key performance indicators (KPIs) in healthcare. KPIs such as Door-to-Needle Time (DTN) and Door-to-Groin Puncture Time (DTP) are critical in improving outcomes for acute ischemic stroke patients. The goal for DTN is ≤60 minutes, with best practices aiming for ≤45 minutes, and for DTP ≤90 minutes, with optimal practice being ≤75 minutes.[7] As stroke awareness increases through public campaigns utilizing **FAST**, more patients will likely arrive at hospitals in time for appropriate treatments within these critical time frames.

3. **Enhancing Public Awareness and Addressing Rural-Urban Disparities:**

   A significant challenge in Bangladesh is the disparity in stroke care between urban and rural areas. Rural populations often face delays due to limited healthcare access, lower awareness levels, and fewer specialized medical services. Khan et al. (2020) reported that public awareness about stroke symptoms and the FAST approach remains low, particularly in rural areas.[8] Integrating the FAST approach into public health campaigns could significantly improve early recognition and reduce treatment delays in rural communities, potentially improving survival rates and recovery outcomes.

4. **Recent Advancements and Technological Integration:**

   Recent advancements in stroke care, such as artificial intelligence (AI) in stroke imaging and diagnosis, have shown promise in reducing treatment delays and improving accuracy. Patel et al. (2021) demonstrated that AI algorithms can assist healthcare professionals in interpreting CT and MRI images more efficiently, helping streamline stroke diagnosis in low-resource settings like Bangladesh.[11] However, access to such technologies remains almost unavailable in Bangladesh.

5. **Streamlining Pre-Hospital and Emergency Response:**

   The pre-hospital phase of stroke management is crucial in ensuring timely interventions. Emergency responders trained in the FAST approach can prioritize stroke cases, expediting transport to appropriate hospitals and allowing stroke teams to prepare for rapid imaging and interventions. In a resource-limited setting like Bangladesh, training first responders and increasing public knowledge about stroke symptoms can significantly reduce the time to treatment, improving patient outcomes.

Stroke Prevention and Public Education

Prevention plays a crucial role in reducing the stroke burden in Bangladesh. Public education campaigns that focus on controlling risk factors such as hypertension, diabetes, and smoking, alongside promoting physical activity, could lead to a substantial reduction in stroke incidence. Studies have shown that comprehensive public awareness interventions, like those implemented by Shaheen et al. (2022), can increase community knowledge and lead to more timely medical attention, reducing delays in care.[12]

Continued efforts to raise awareness about stroke risk factors and symptoms, particularly in rural areas, are essential to addressing the growing stroke burden in Bangladesh.

Stroke Imaging in Bangladesh:

Stroke is a medical emergency that requires timely diagnosis and appropriate intervention. Imaging plays a vital role in guiding stroke management, as it helps determine the type of stroke, assess brain damage, and guide treatment strategies such as thrombolysis and mechanical thrombectomy. In Bangladesh, stroke imaging practices, while advanced in urban hospitals, face several barriers in rural and secondary healthcare centers. These barriers impede the timely diagnosis and treatment of stroke patients, especially in the early and acute phases.

Challenges in Stroke Imaging in Bangladesh

Despite the critical role of imaging in stroke diagnosis and treatment, Bangladesh faces multiple challenges in accessing and utilizing advanced stroke imaging techniques, particularly in rural areas:

- **Limited Access to Advanced Imaging**: MRI and advanced imaging techniques such as CT Perfusion (CTP) are not available in many regions, leading to delays in accurate stroke diagnosis. According to Siddique et al. (2021), rural areas face significant barriers in accessing MRI facilities, which are often concentrated in urban centers.[5] This results in prolonged diagnostic delays, affecting patient outcomes.
- **Cost Constraints**: Advanced imaging procedures like MRI and CTP are expensive, and many patients in Bangladesh are unable to afford these services. A study by Khan et al. (2020) emphasized that out-of-pocket expenses for imaging are a significant barrier, especially for patients in low-income rural communities.[8] Although the cost of imaging in Bangladesh is relatively low compare to the others Asian countries.
- **Shortage of Trained Personnel**: Bangladesh suffers from a shortage of trained radiologists and stroke specialists. These professionals are primarily located in urban areas, which leads to delays in the interpretation of images and subsequent treatment decisions, as noted by Jahan et al. (2019).[10]
- **Lack of Public Awareness**: Many stroke patients arrive at hospitals too late, reducing the efficacy of thrombolytic and reperfusion therapies. A study by Shaheen et al. (2022) found that public awareness of stroke symptoms and the importance of early treatment is low in rural areas, leading to delays in seeking medical care.[12]

Imaging Protocol Based on Stroke Time Window

The management of stroke is highly time-sensitive, and imaging is essential for confirming the diagnosis and determining the most appropriate treatment options. Stroke imaging protocols are often divided into phases: the hyperacute, acute, subacute, and chronic phases, each of which requires different imaging techniques.

Hyperacute Phase (0-24 hours)

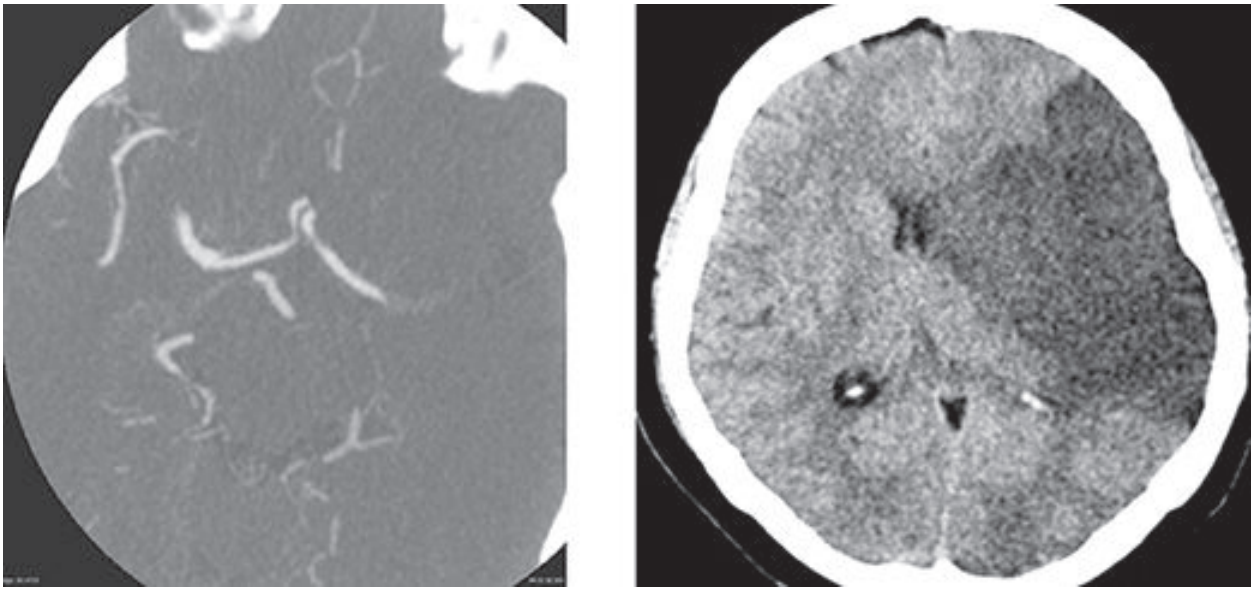
In the first 24 hours after symptom onset, timely imaging is essential for early diagnosis, identifying large vessel occlusions (LVOs), and determining tissue viability for reperfusion therapies such as thrombolysis and thrombectomy. Key imaging techniques used in this phase include:

- **Non-contrast CT**: This is the rapid initial imaging technique for detecting hemorrhagic strokes and early ischemic changes.
- **CT Angiography (CTA)**: This helps visualize large vessel occlusions, especially in major arteries like circle of Willis arteries (COW) and Carotid arteries.
- **CT Perfusion (CTP)**: This technique assesses blood flow to the brain and helps identify ischemic penumbra (the area of brain tissue at risk but still viable for reperfusion).
- **MRI (DWI)**: Diffusion-weighted imaging is the most sensitive technique for detecting acute ischemia within minutes of symptom onset.

In Bangladesh, access to MRI and advanced imaging such as CTP is limited outside major cities, resulting in delayed diagnoses and treatment decisions.[5]

Acute Phase (24 hours to 1 week)

In the acute phase, imaging helps evaluate the extent of tissue damage, monitor reperfusion, and guide decisions on whether to proceed with thrombolysis or thrombectomy. Key imaging techniques during this phase include:



A B

Figure 1: *CT angiogram (A) showing occlusion of the left middle cerebral artery (MCA) and subsequently, there is left MCA territory acute infarction (B) with development of cytotoxic edema causing rightwards midline shift.*

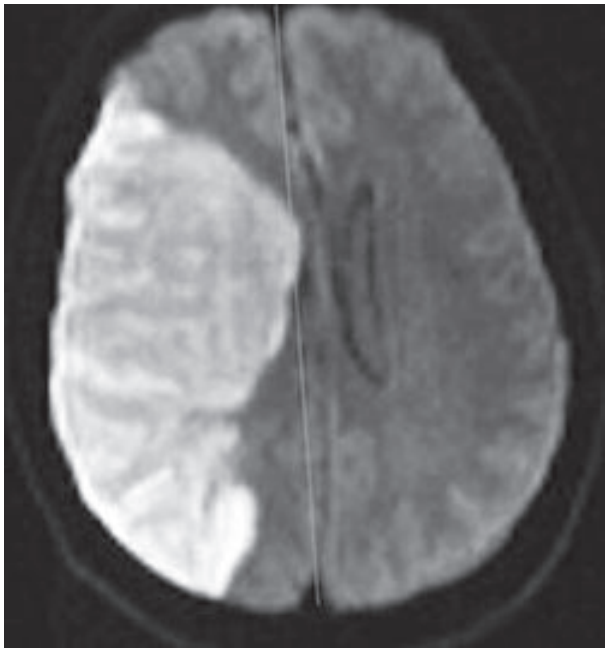


Figure 2: *A diffusion-weighted MR I scan showing an area of restricted diffusion in the right MCA territory, indicative of acute ischemia. DWI is the most sensitive technique for detecting acute infarct within minutes of symptom onset. However, DWI can't differentiate the tissue viability effectively.*

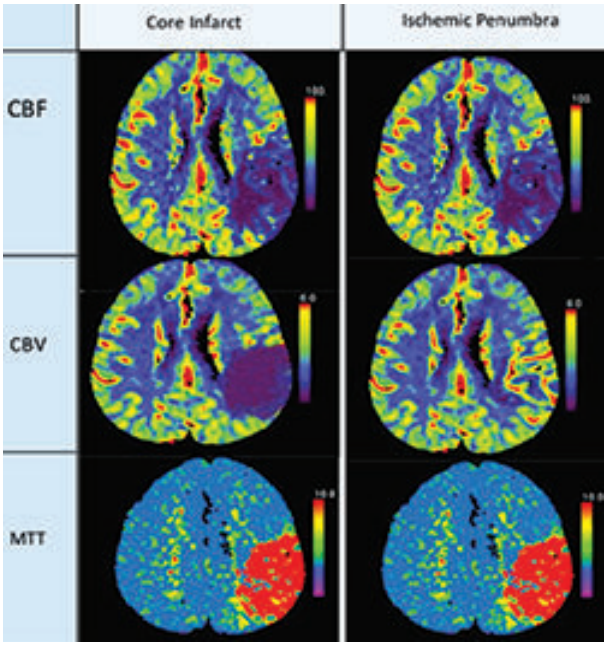


Figure 3: *A CT perfusion scan showing areas of Core infarct in the left column (there is neuronal death of the affected tissue) which suggesting that thrombectomy will not be benefited for the treatment, and on the other side, area of mismatched perfusion defect in the right column indicates ischemic penumbra (the area of brain tissue at risk but still viable for reperfusion) which confirms the indication of Interventions such as thrombectomy.*

- **Non-contrast CT**: Useful for detecting hemorrhages and ischemic lesions.
- **CT Angiography (CTA)**: Employed for follow-up after the initial treatment to assess the restoration of blood flow.
- **CT Perfusion (CTP)**: Continues to assess ischemic penumbra and infarct core, particularly for patients outside the 3-hour thrombolysis window but within the 6–24 hours thrombectomy window.
- **MRI (T1, T2, FLAIR, SWI, DWI, PWI, MRA)**: MRI techniques help identify restricted diffusion areas and areas of ischemic penumbra, guiding treatment decisions.

Due to resource constraints in peripheral hospitals, many patients in Bangladesh are unable to undergo timely follow-up imaging, impacting treatment decisions and outcomes.[13-14]

Subacute Phase (1 week to 3 weeks)

In the subacute phase, imaging is crucial for tracking tissue recovery, monitoring edema, and detecting complications such as hemorrhagic transformation. Imaging techniques during this phase include:

- **MRI (T1, T2, FLAIR, DWI, SWI)**: Tracks edema, tissue evolution, and infarction progression or hemorrhagic transformation.
- Non-contrast CT, **CT Angiography (CTA)**: Follow-up imaging to detect hemorrhagic transformation, recurrent occlusions or complications from arterial dissection.
- **CT Perfusion (CTP)**: Assesses the success of reperfusion and monitors for any secondary damage.

Due to the mobility challenges of patients and financial constraints, follow-up imaging in the subacute phase is often delayed, leading to suboptimal monitoring of stroke recovery in rural regions.[4]

Chronic Phase (3 weeks and beyond)

In the chronic phase, imaging helps evaluate long-term recovery, brain atrophy, and the development of neuroplasticity. The key imaging techniques include:

- **MRI (T1, T2, FLAIR, DWI)**: These are used to monitor brain atrophy and scarring in infarcted regions.
- Non-contrast CT**, CT Perfusion (CTP)**: Although rarely used in the chronic phase, it may still help assess residual ischemic areas or collateral circulation.

In Bangladesh, the economic burden of healthcare is a major challenge, and many patients in the chronic phase cannot afford imaging, limiting long-term monitoring of stroke recovery and rehabilitation.

Summary Table: Stroke Imaging

Phase of Stroke	Key Imaging Techniques	Purpose/Benefits	Challenges in Bangladesh
Hyperacute (0-24 hours)	Non-contrast CT, CT Angiography (CTA), CT Perfusion (CTP), MRI (DWI)	- Rapid diagnosis of stroke type (ischemic vs hemorrhagic) and large vessel occlusions. - Assessment of tissue viability for reperfusion therapies.	- Limited access to MRI, especially in rural areas. - Delays in receiving imaging.
Acute (24 hours to 1 week)	Non-contrast CT, CTA, CTP, MRI (**T1, T2, FLAIR, SWI, DWI, PWI, MRA**)	- Monitor ischemic damage. - Guide decisions on thrombolysis and thrombectomy. - Follow-up on vessel occlusions and reperfusion.	- Limited advanced imaging facilities in peripheral hospitals.
Subacute (1 week to 3 weeks)	Non-contrast CT, CTA, CTP, MRI **(T1, T2, FLAIR, DWI, SWI)**	- Monitor for secondary complications (hemorrhagic transformation, edema). - Track tissue recovery and assess reperfusion.	- Difficulty in timely follow-up imaging due to patient mobility and financial constraints.
Chronic (3 weeks and beyond)	Non-contrast CT, CT Perfusion, MRI (T1, T2, FLAIR, DWI)	- Assess long-term brain changes (atrophy, scar tissue). - Evaluate recovery and neuroplasticity.	- Limited accessibility to chronic-phase imaging due to economic constraints.

Conclusion:

Stroke remains a critical healthcare issue in Bangladesh. Despite the utility of the FAST approach for early detection, delayed medical intervention continues to result in significant mortality and disability. Rapid imaging is crucial for effective treatment, as each minute of delay can lead to irreversible neuronal death. To overcome the stroke burden, we recommend the following:

1. Public Education: Launch nationwide campaigns to raise awareness of stroke symptoms and the FAST approach, particularly in rural areas.
2. Improved Healthcare Infrastructure: Increase access to imaging services in rural and underserved areas through government and private initiatives.
3. Training and Capacity Building: Invest in training programs for radiologists and stroke specialists to improve early diagnosis and treatment.
4. Timely Intervention: Ensure adherence to KPIs, such as door-to-needle and door-to-groin puncture times, for timely thrombolysis and thrombectomy.

By improving public awareness, healthcare infrastructure, and adherence to stroke KPIs, Bangladesh can reduce the stroke burden and significantly enhance patient outcomes.

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Ethical Approval: Not applicable, as this is a review article.

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Original Article

KNOWLEDGE ATTITUDE & PRACTICE (KAP) ABOUT INFECTION PREVENTION CONTROL (IPC) AND WASTE MANAGEMENT DURING COVID-19 AMONG THE HEALTHCARE WORKERS IN PRIMARY LEVEL GOVERNMENT HOSPITALS IN BANGLADESH

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IPC, Waste Management, COVID-19, Infection

Abstract:

Infection prevention and control (IPC) is essential for reducing healthcare-associated infections by creating barriers between infectious agents and susceptible hosts. This study assessed the knowledge, attitudes, and practices (KAP) related to IPC and waste management among healthcare workers in primary-level government hospitals in Cumilla District, Bangladesh.

A cross-sectional descriptive study was conducted from August 2021 to September 2022 across 17 Upazilas, using a non-probability convenience sample of 261 healthcare workers. Data were collected via structured interviews and analyzed using Chi-square tests and logistic regression.

Results showed that 54.5% of participants had adequate IPC knowledge, 96.8% displayed positive attitudes, and 87.3% reported good IPC practices. Healthcare workers under 25 years were significantly less knowledgeable than older age groups (AOR=34.75; 95% CI: 4.532–266.554). Health assistants and nurses were 98% less knowledgeable compared to physicians. Diploma holders demonstrated lower knowledge than MBBS holders. Facilities with IPC teams were associated with higher knowledge levels (AOR=0.103; 95% CI: 0.035–0.307), while irregular hand hygiene training correlated with reduced knowledge (AOR=0.107; 95% CI: 0.029–0.388).

Although most healthcare workers reported good IPC practices and attitudes, gaps in knowledge persist—especially among non-physician staff and those with limited training opportunities. Strengthening regular training programs, establishing functional IPC committees, and improving supervision are crucial to enhance IPC compliance and reduce the risk of infection transmission in healthcare settings.

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Introduction:

Healthcare-associated infections (HCAIs) pose a significant public health challenge contributing to increased morbidity and mortality and rising health-care costs in developed and developing countries. They remain a major cause of preventable illness and death specially in low and middle income countries.[1] Healthcare-associated infection can be defined as "Infection occurring in a patient during the process of care in any healthcare facility which was not present or incubating at the time of admission". It also covers infections acquired in the hospital but appearing after discharge and occupational infections among the facility staff.[2] In developed countries, the prevalence of healthcare-associated infection ranges from 3.5% to 12%. With an average of incidence of 7.1% in European countries. According to the European Centre for Disease Prevention and Control, approximately 4.5 million HCAI cases affect around 431,000 patients annually in Europe. In the United States, the 2002 incidence rate was 4.5%, equating to 9.3 infections per 1,000 patient-days and affecting 1.7 million patients. On the other hand, low and middle-income nations have limited data, which is sometimes of poor quality. According to a recent WHO study, healthcare-associated illnesses are more common in resource-

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constrained settings than in developed ones. In low and middle-income nations, the prevalence of healthcare-associated infection fluctuates between 5.7 % and 19.1% at any one moment (3). High-quality studies report an average prevalence of 15.5%, nearly double that of high-income countries (8.5%). In these settings, the infection rate can reach 42.7 per 1,000 patient-days—nearly three times higher than in high-income countries.[3]

In Bangladesh, inadequate record-keeping and follow-up limit accurate data collection on HCAIs. Some urban hospitals report HCAI rates as high as 30%. Key infrastructural deficiencies—such as insufficient wash stations, lack of bedside hand sanitizers, and absence of isolation facilities—worsen the situation. Medical waste mismanagement and limited awareness of infection control practices among healthcare workers also contribute to increased risk. Yet, HCAIs can often be prevented using cost-effective strategies, such as implementing national and facility-level infection control measures.[4] et, HCAIs can often be prevented using cost-effective strategies, such as implementing national and facility-level infection control measures.[5] Infection prevention control programs are economical. An infection control program must include education for health care workers, HAI surveillance, proper regulations, and core infection control procedures.[6]

Infection prevention and control (IPC) is a scientifically driven, practical approach to minimizing infection risks for both patients and healthcare workers. According to the WHO, IPC draws on epidemiological data, health system strengthening, and infectious disease management. As IPC is relevant to every healthcare interaction, it is a cornerstone of patient safety and high-quality healthcare delivery.[7] Infection Prevention and Control is a systematic process or any procedures, policies, and activities which can establish a barrier between a microorganism and a vulnerable host and microorganisms which is targeted at reducing or preventing the risk of infectious disease transmission in a health care facility. It is found that standard precautions are most effective in preventing both occupational exposure incidents and associated infections.[8] Every healthcare facility should follow the IPC, and the physicians play a critical role in its implementation.

A novel coronavirus (SARS- COV-2), also known as COVID-19) was discovered in Wuhan, China, in December 2019.[9] From its first detection till date, around 200 million people are affected worldwide, with the death of more than 4 million.[10] In the last 20 years two more coronavirus outbreaks, SARS-CoV and MERS-CoV, have resulted in many cases across various countries. Due to a lack of understanding of the emerging threats and HCW face enormous problems and dangers because to the reliance on infection prevention and control (IPC) strategies that might not take into account all developing pathogen transmission patterns.[11]

The COVID-19 pandemic has exposed critical weaknesses in IPC practices across healthcare systems. HCWs face increased risk of infection and transmission due to frequent exposure to SARS-CoV-2.[12] Because of their frequent exposure to COVID-19, HCWs are at a higher risk of acquiring the disease and transmitting it to their families, colleagues, and to other patients.[13]

Human-to-human transmission often occurs through respiratory droplets or contaminated surfaces (fomites), with evidence also suggesting the virus's presence in blood, sputum, urine, feces, and tears. SARS-CoV can survive up to nine days on surfaces and up to 96 hours in various body fluids.[14] Therefore, implementing strict IPC measures can protect healthcare workers from such pathogens.

A comprehensive approach is necessary to improve the prevention and control of such infections in countries with limited resources. This will be built on enhanced healthcare structures, increased knowledge, practical instructions, behavioral and attitude changes, as well as the effective and efficient use of previously available resources and internal cooperation. The only methods of reducing and protecting HCWs and patients from episodes of HCAIs and unnecessary injuries is to comply with IPC measures.

Standard and additional precautions have been suggested by both the WHO and the CDC. Standard Precautions are the most basic IPC procedures that should be followed in all patient-care settings, regardless of whether the patient is infected or not. It must be followed at all times when health care is provided. These procedures are intended to keep Health Care Personals safe while also preventing them from transmitting diseases to their patients. These procedures are aimed at keeping HCPs safe while also preventing them from transmitting diseases to their patients. However, standard precautions include

things like hand washing, respiratory hygiene, coughing etiquette, the use of personal protective equipment, safe injection techniques, sharps management, injury prevention, safe handling, cleaning, and disinfection of patient care equipment, sterile instruments and devices, clean and disinfected environmental surfaces, and waste management.[15]

Additional IPC practices, in addition to standard precautions, are advised as a part of health care delivery to all patients during COVID-19 pandemic. These guidelines are designed for all patients, not only those who have been diagnosed with SARS-CoV-2.[16] For efficient IPC implementation in this COVID-19 circumstance, the following methods should be implemented in all health care settings. These include ensuring triage, early detection, source control, standard precaution application for all patients, contact and droplet precautionary measures along with airborne precautions for aerosol generating procedures, effective administrative control and using environmental control.

The knowledge and compliance of healthcare workers are critical for effective IPC. However, poor understanding of IPC standards and limited awareness of preventive practices significantly hinder compliance. Often, IPC only garners attention during outbreaks, despite being a longstanding issue in healthcare settings. Proper training, behavior change, and continuous education are key to overcoming these barriers and reducing HCAIs .[17] In order to overcome these obstacles, effective training and education are the pillars of improving IPC practices. To minimize HAIs in Bangladesh, we need enhanced healthcare systems, effective guidelines, behavioral changes, and attitude adjustment. An efficient infection control program ensures that both service providers and service recipients are protected. On the other hand, excellent knowledge does not always imply good IPC practice. Despite well-established standards for the prevention of HAIs, certain HCWs may have been found to be noncompliant with IPC .[18] To overcome these obstacles, effective training and education are the pillars of improving IPC practices.

Methods:

Study place, population and period

This cross-sectional study was carried out among 220 healthcare workers working in primary care hospitals of different upazilas of Cumilla district, Bangladesh. The study period was from July 2021 to January 2022. This study specifically targeted healthcare workers with experience of more then one year in experience. Health care workers exhibiting unwillingness to participate in the study or those who refused to give informed consent were excluded. Non-probability type of convenient sampling will be used as sampling technique.

Data collection instrument

Semi structured questionnaire was used for data collection. The questionnaire was divided into two sections. The first section gathered information on sociodemographic profiles and professional characteristics including facility type, age, sex, HCW type. Education level, work experience etc. The second section assessed the knowledge, attitude and practice related to infection prevention and control (IPC). The responses were collected through multiple-choice questions and Likert scale items with options varying based on the questions asked.

Data Management & Analysis Plan

A computer-based software SPSS was used for processing and analysis of the data. For data analysis, various statistical methods were used. When the P-value was less than 0.05 with a 95% confidence interval, it was considered statistically significant. T-test and chi-square test was done to assess the relationship between outcomes and independent variables.

Result

Sociodemographic Characteristics:

A total of 220 HCWs were participated and included in the study. Among 220 respondents 74 (33.6%) were males and 146 (66.4%) were females (N=220) (Figure 1). Of the study participants, 24 (10.9%) of HCWs were less than 25 years old and 113 (51.4%) were in the age group of 26-35 years, 57 (25.9%) were in the age group of 36-45 years and 26 (11.8%) were range in the age group of above >45 years. The mean age of the respondent was 34.92 (SD ± 8.6) and majorities 78.6% of them were Muslim. Concerning the professional categories of respondents 66 (30.0%) were Doctors, five were Health assistants, 98 (44.5%) were Nurses, 15 (6.8%) were midwives and 36 (16.4 %) were cleaners (Figure 2). Most of the respondents had work experience between 6-20 years 116 (52.7%), 75 (34.1%) of the respondents were with service years of less than five years. Regarding educational status

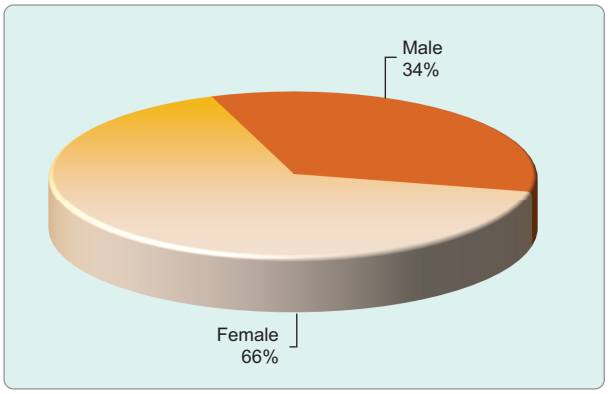

Figure 1: *Sex distribution of the respondents in percentage*

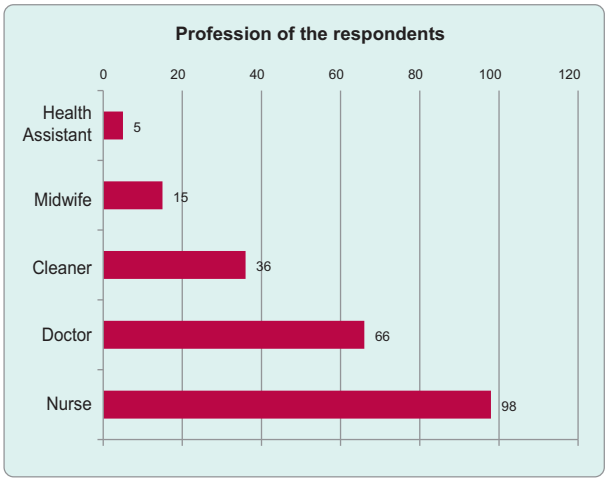

Figure 2: *Profession of the respondents*

66 (30.0%) of them were MBBS, 113 (51.4%) were Diploma and 36 (16.4%) were below HSC level (Figure 3). As the study place were primary healthcare centers

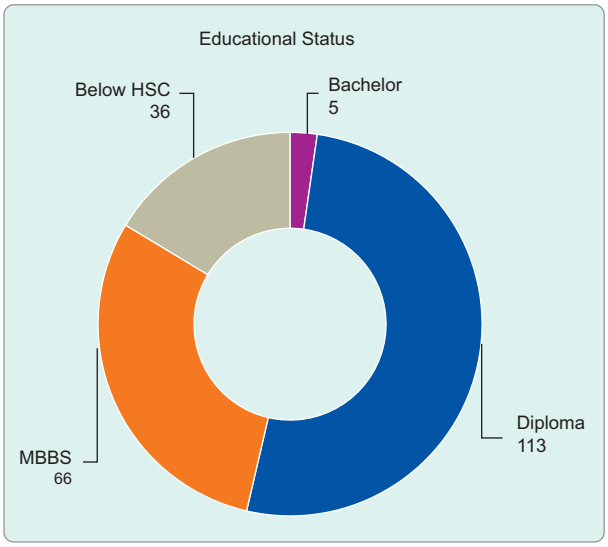

Figure 3: *Educational Status of the respondents*

that's why the maximum number of participants 159 (72.3%) were from Upazilla health complex. (Table I).

Knowledge about Infection Prevention and Control:

Among the study respondent's majority of 154 (70.0%) responded that they know about infection prevention and control. Among them, 53 (24.1%) of the respondents did not hear about infection prevention control before COVID-19. Ninety-One (41.4%) of the health care workers knew about the triage system. Among the respondent's majority, 90% and 91.8% knew about the recommended guideline for hand hygiene and the seven steps of handwashing. More than half of the respondents (54.1%) haven't known about the liquid spill management guideline. And half of the respondents didn't know concerning the preparation formula for preparing 0.5% chlorine solution (Table 5). In general, 120 (54.5%) of HCWs have good knowledge of infection prevention and control and 100 (45.5%) have poor knowledge (Figure 4).

Attitude on infection prevention and control measures

Out of 220 study participants 196 (89.1%) of HCWs had a positive attitude in asking every patient if they have any symptoms of infection and 24 (10.9%) had negative. Out of 220 respondents 188 (85.5) HCW advice very often to every patient to wear a mask. Of the total participants, 155 (70.5%) reported that they very often instructed coughing patients to follow cough hygiene procedures when coughing or sneezing, while 42 (19.1%) indicated that they did so only sometimes. Less than half of the respondents 84 (38.2%) ask very often the patients about hand washing before entering the hospital or ward, 35 (15.9%) never asked any patients. Most of the participants 213 (96.8%) had a positive attitude toward following any special advice by the hospital IPC committee.

Practice towards infection prevention measures

In this study Among the respondent, 191 (86.8%) very often wash their hands before and after contact with patients, and 11 (5%) of them wash sometimes. Of total respondents 98 (44.5%) often maintain proper hand wash technique while 39 (17.7%) sometimes followed. Maximum respondents 144 (65.5%) discard waste immediately into the container and 99 (45) empty the container while they are three-quarter full very often and 26 (11.8%) and 51 (23.2%) follow sometimes respectively. Most of the HCW 131 (59.5%) very often change chlorine solution within 24 hours, 23 (10.5%) sometimes and four (1.8%) responded never change chlorine solution within 24 hours (Table

Table-I

Descriptive characteristics of the participant and their relationship to IPC knowledge, attitude, practice, and knowledge of waste management (N=220)

Variable	N	%	IPC		Waste management procedures		
			SD	Knowledge	Attitude	Practice	Knowledge
			*P value**	*P value**	*P value**	*P value**	
Age (in years)							
<25	24	10.91	8.6	*<0.001*	0.842	*0.001*	*0.007*
26-35	113	51.36					
36-45	57	25.91					
>45	26	11.82					
Gender							
Male	74	33.64	,47	0.297	*<0.001*	0.050	0.296
Female	146	66.36					
Profession							
Physician	66	30.00	1.6	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Health Assistant	5	2.27					
Nurse	98	44.55					
Midwife	15	6.82					
Cleaner	36	16.36					
Educational status							
MBBS	66	30.00	1.08	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Undergraduate	118	53.64					
Below 12th standard	36	16.36					
Work experience							
< 5 years	75	34.09	7.92	0.133	0.115	0.145	*<0.001*
6-20 years	116	52.73					
> 20 years	29	13.18					
Level of facility							
Tertiary level	61	27.73	0.5	0.196	0.805	*<0.001*	*<0.001*
Primary and Secondary level	159	72.27					
Religion							
Islam	173	78.64	.45	*<0.001*	0.565	0.558	0.881
Hinduism	44	20.00					
Buddhism	3	1.36					

*Chi square test done; p value bold and italic=significant

N= Total participant, IPC=Infection control and prevention

5). In general, 192 (87.3%,) of HCWs have good practice towards infection prevention and control measures and the remaining 28 (12.7%) of health care workers have poor practice. (Table II).

Profession, Educational status, and facility level of the respondents were found associated with the practice of IPC in the bivariate analysis.

Knowledge of waste management

Of the 220 respondents Majority of the HCW 178 (80.9%) know about the waste management protocol of the facility. Regarding the laundry and cleaning procedures of the facility 157 (71.4%) responded positively and 48 (21.8%) responded negatively and 15 (6.8) responded that they do not know. 144 (65.5%)

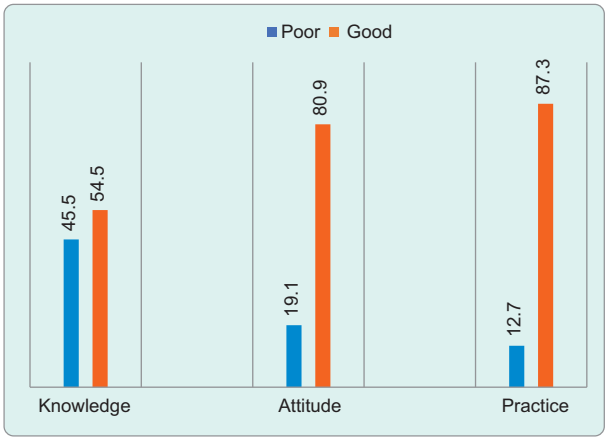

Figure 4: *Knowledge, Attitude and Practice regarding IPC of the respondents*

know about the waste segregation process of their facility. Out of 220 respondents 68 (30.9%) believes that there are no coordination between clinical staff and waste management staff whereas 35 (15.9%) responded that they don't know about the coordination.

Infection Control Training, Competency, and Implementation of Policies

Among the 220 respondents only 54(24.50%) has responded that they have IPC committee in their facility, majority 103 (46.8%) responded that they don't have any IPC team in their facility, 63 (28.6%) don't know about IPC team. The majority of the HCWs 138 (62.7%) responded that they sometimes received training on IPC and 57 (25.9%) responded that they never received any IPC training. Frequency of hand hygiene training takes place very often according to 32 (14.5%) respondents, often by 84 (38.2%) and never from 43 (19.5%) respondents. Among 220 respondents 155 (70.5%) responded that there is no system for reporting accidental exposure to blood and body fluids (Table III).

The facility which has IPC team are more knowledge than those who don't have (AOR=.103, 95% CI:.035-.307), Triage facility 76% less (AOR= .495; 95% CI:.236-1.037), The respondents who received Hand hygiene training sometimes are 89% less knowledgeable than who received often (AOR= .107; 95% CI: .029-.388)

Table-II

Practice towards infection prevention measures of HCWs

	Variables	Level of knowledge	Frequency (N)	Percentage
Practice on IPC				
Do you wash your hands before & after contact with patients?	Very often	191	86.8 %	.110
	Often	18	8.2 %	
	Sometimes	11	5.0 %	
	Never	0	0 %	
Do you maintain proper hand washing techniques each time?	Very often	83	37.7 %	*.009*
	Often	98	44.5 %	
	Sometimes	39	17.7 %	
	Never	0	0 %	
Do you discard wastes immediately into their container?	Very often	144	65.5 %	*.007*
	Often	50	22.7 %	
	Sometimes	26	11.8 %	
	Never	0	0 %	
Do you dispose containers when they are three-quarter full?	Very often	99	45.0 %	*<.001**
	Often	69	31.4 %	
	Sometimes	51	23.2 %	
	Never	1	.5 %	
Do you change chlorine solution after 24h?	Very often	131	59.5 %	*<.001**
	Often	62	28.2 %	
	Sometimes	23	10.5 %	
	Never	4	1.8 %	
Do you follow the safety precautions for the disposal of sharp waste?	Very often	152	69.1 %	*<.001**
	Often	44	20.0 %	
	Sometimes	22	10.0 %	
	Never	2	.9 %	

*Chi square test done; p value bold and italic=significant
N= Total participant, IPC=Infection control and prevention

Table-III

Infection Control Training, Competency, and Implementation of Policies at workplace and their relation to IPC knowledge, attitude, and practice (N=220)

	N	%	Infection prevention and control measures Knowledge *P value**	Attitude *P value**	Practice *P value**	
Availability of infection control team						
Yes	54	24.55	*<0.001*	*<0.001*	*0.023*	
No	103	46.82				
Don't Know	63	28.64				
Availability of triage system						
Yes	91	41.36	*<0.001*	*<0.001*	*<0.001*	
No	53	24.09				
Don't Know	76	34.55				
Frequency of IPC training						
Very often	2	0.91	*<0.001*	*<0.001*	*<0.001*	
Often	23	10.45				
Sometimes	138	62.73				
Never	57	25.91				
Frequency of Hand hygiene training						
Very Often	32	14.55	*<0.001*	*<0.001*	*<0.001*	
Often	84	38.18				
Sometimes	61	27.73				
Never	43	19.55				
System for reporting accidental exposure						
No	155	70.45	0.106	0.365	*<0.001*	
Don't Know	65	29.55				

*Chi square test done; p value bold and italic=significant
N= Total participant, IPC=Infection control and prevention

Table-IV

IPC knowledge, attitude and practice and knowledge of waste management and associated factors (N=220)

	N (%)	IPC Knowledge *P value**	IPC attitude *P value**	IPC practice *P value**
IPC Knowledge				
Poor	100(45.45)			*<0.001*
Good	120(54.55)			
IPC attitude				
Negative	42(19.09)	*0.036*		
Positive	178(80.91)			
IPC practice				
Poor	28(12.73)		*0.025*	
Good	192(87.27)			
Waste management knowledge				
Poor	73(33.18)	*0.039*	*<0.001*	0.761
Good	147(66.82)			

*Chi square test done; p value bold and italic=significant
N= Total participant, IPC=Infection control and prevention

Table-V

Knowledge towards Infection prevention control practices and measures (N=220)

Variables	Level of knowledge	Frequency	Percentage
Do you have knowledge about infection prevention Control?	Yes	154	70.0%
	No	64	29.1%
	I don't know	02	0.9%
Have you heard about infection prevention Control	Yes	167	75.9%
before COVID-19?	No	53	24.1%
	I don't Know	00	00%
Do you know about Triage system?	Yes	91	41.4%
	No	64	29.1%
	I don't know	65	29.5%
Do you know about the guidelines on standard	Yes	106	48.2%
precautions for infection prevention?	No	109	49.5%
	I don't know	5	2.3%
Do you know about the recommended guidelines for	Yes	198	90%
hand hygiene	No	22	10.0%
	I don't Know	00	00%
Do you know about the effectiveness of hand washing	Yes	202	91.8%
in preventing disease?	No	18	8.2%
	I don't Know	00	00%
Do you know the 7 steps of hand washing	Yes	193	87.7%
	No	27	12.3%
	I don't Know	00	00%
Do you know about liquid spill management?	Yes	70	31.8%
	No	119	54.1%
	I don't Know	31	14.1%
Do you know about safe injection practice?	Yes	185	84.1%
	No	29	13.2%
	I don't Know	6	2.7%
Do you know how to prepare hypochlorite solution?	Yes	103	46.8%
	No	110	50.0%
	I don't Know	7	3.2%
Do you know about nosocomial infection?	Yes	132	60.0%
	No	86	39.1%
	I don't Know	02	0.9%

Discussion

This study assessed the knowledge, attitude, and practices (KAP) of healthcare workers (HCWs) on Infection Prevention and Control (IPC) within primary-level government health care facilities. The findings suggest that a considerable proportion of HCWs possess satisfactory knowledge and demonstrate adequate IPC practices. However, gaps remain in attitudes and in the consistent application of preventive measures.

Age was found to be significantly associated with both IPC knowledge and practice. This is consistent with findings from a study conducted in Ethiopia, where older HCWs were more likely to exhibit better IPC practices, likely due to increased work experience and exposure to training opportunities.[11] Similarly, this study found that attitude toward IPC was significantly associated with gender, aligning with previous research from Nepal which highlighted gender-related differences in risk perception and compliance with IPC guidelines.

Educational status and profession were significantly associated with all three components of KAP. Higher educational attainment and professional roles such as nursing or medical officers were linked with stronger IPC knowledge and practice, echoing results from a study in Nigeria which showed that professional role and training level had a direct impact on IPC compliance.[33]

Knowledge about waste management was significantly associated with education level, professional background, and the facility level. This corresponds with findings from studies in India and Pakistan, which emphasized the importance of targeted training in biomedical waste management for improved IPC compliance at all facility levels.[34]

Availability of IPC-related resources—such as medical masks, alcohol-based hand rub, disposable gloves, and environmental disinfectants—was significantly associated with better IPC practices. This finding mirrors research conducted in Bangladesh and Kenya, which reported that resource availability is a key enabler of IPC adherence.[35]

Training also played a pivotal role. Frequency of IPC training, hand hygiene training, and the presence of triage systems were all significantly associated with knowledge, attitude, and practice. This is supported by global studies during the COVID-19 pandemic, which showed that continuous training and on-site simulation exercises significantly improve IPC performance and staff readiness.

Despite these insights, this study had several limitations. The sample size was small and restricted to a single district, limiting the generalizability of findings to the national level. Furthermore, the cross-sectional design precludes establishing causal relationships between variables. Also, due to the limited geographical and facility-level scope, the study could not fully capture the influence of broader socioeconomic and demographic determinants or their linkage to health outcomes.

Conclusion and Recommendation

The practice of Infection Prevention and Control (IPC) among healthcare workers is generally good; however, there are gaps in knowledge in certain areas. The key factors that influence are age, profession, educational background. Doctors and nurses tend to have better knowledge while other healthcare workers have less awareness and receive less training on IPC and hand hygiene. regular practice sessions and training programs should be organized, especially for cleaning staff, to refresh their knowledge and reduce errors in IPC practices. Additionally, ongoing supervision and monitoring are recommended. Establishing an IPC committee within the facility is essential for effective oversight. due to the small sample size of this study, we cannot draw definitive conclusions about the overall knowledge, attitudes, and practices of healthcare workers regarding IPC. Since there has not been a similar study conducted in the country, this research can serve as a valuable reference for future studies on a larger scale.

Appendix

Questionnaire

Title: Knowledge, attitude & practice (KAP) about Infection Prevention Control (IPC) and waste management during COVID-19 among the healthcare workers in primary level government hospitals in Bangladesh".

I will appreciate if you could complete the following table.

Any information obtained in connection with this study that can be identified with you will remain confidential. Please read the questions carefully. Once you have read the questions, please select one of the options below based on how you know with the statement provided,

Section-1

Socio-demographic information of respondents:

Sl no.	Questions	Options	Remarks
1.1	Name of the respondent		
1.2	Name of the facility		
1.3	Level of the facility	¨ Medical College Hospital	
		¨ District Hospital	
		¨ Upazilla Health Complex	
		¨ Union Sub-center	
		¨ Community Clinic	
1.4	Age (in years)		
1.5	Religion	¨ Islam	
		¨ Hinduism	
		¨ Buddhism	
		¨ Christianity	
		¨ Others	
1.6	Sex	¨ Male	
		¨ Female	
1.7	Profession	¨ Doctor	
		¨ Health assistant	
		¨ Nurse	
		¨ Midwife	
		¨ Lab technologist	
		¨ Cleaner	
		¨ Other	
1.8	Educational status	¨ MBBS	
		¨ Bachelor	
		¨ Diploma	
		¨ Below HSC	
1.9	Work experience (In years)		

Section-2

Knowledge on infection prevention measures:

Sl no.	Questions	Options	Remarks
2.1	Do you have knowledge about infection prevention Control?	¨ Yes ¨ No ¨ I don't know	
2.2	Have you heard about infection prevention Control before COVID-19?	¨ Yes ¨ No ¨ I don't know	
2.3	Do you know about Triage system?	¨ Yes ¨ No ¨ I don't know	
2.4	Do you know about the guidelines on standard precautions for infection prevention?	¨ Yes ¨ No ¨ I don't know	
2.5	Do you know about the recommended guidelines for hand hygiene	¨ Yes ¨ No ¨ I don't know	
2.6	Do you know about the effectiveness of hand washing in preventing disease?	¨ Yes ¨ No ¨ I don't know	
2.7	Do you know the 7 steps of hand washing	¨ Yes ¨ No ¨ I don't know	
2.8	Do you know about liquid spill management?	¨ Yes ¨ No ¨ I don't know	
2.9	Do you know about safe injection practice?	¨ Yes ¨ No ¨ I don't know	
2.10	Do you know how to prepare hypochlorite solution?	¨ Yes ¨ No ¨ I don't know	
2.11	Do you know about nosocomial infection?	¨ Yes ¨ No ¨ I don't know	

Section-3

Attitude on infection prevention and control measures

Sl no.	Questions	Options	Remarks
3.1	Do you feel comfortable asking every patient if they have any symptoms of infection?	¨ Yes ¨ No ¨ I don't know	
3.2	Do you advice every patient to wear a mask?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
3.3	Do you tell coughing patients to follow cough hygiene and etiquette?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
3.4	Do you ask the patient about hand washing before entering the hospital?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
3.5	If you receive any special advice by the hospital infectious committee for COVID-19 would you follow them?	¨ Yes ¨ No ¨ I don't know	
3.6	Do you believe Personal Protective Equipment's (PPE) protect HCWs from infection?	¨ Yes ¨ No ¨ I don't know	

Section-4

Practice towards infection prevention measures

Sl no.	Questions	Options	Remarks
4.1	Do you wash your hands before & after contact with patients?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
4.2	Do you maintain proper hand washing techniques each time?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
4.3	Do you discard wastes immediately into their container?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
4.4	Do you dispose containers when they are three quarter full?	¨ Very often¨ ¨ Often ¨ Sometimes ¨ Never	
4.5	Do you change chlorine solution after 24h?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
4.6	Do you follow the safety precautions for disposal of sharp waste?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	

Section-5

Availability of infection control resources/supplies at their facilities.

Sl no.	Questions	Options	Remarks
5.1	Clean running water	¨ Always available ¨ Sometimes available ¨ Very rarely available ¨ Not available	
5.2	Medical (surgical or procedural) masks	¨ Always available ¨ Sometimes available ¨ Very rarely available ¨ Not available	
5.3	Hand-washing soap/liquid soap	¨ Always available ¨ Sometimes available ¨ Very rarely available ¨ Not available	
5.4	Alcohol based hand rub	¨ Always available ¨ Sometimes available ¨ Very rarely available ¨ Not available	
5.5	Disposable latex gloves	¨ Always available ¨ Sometimes available ¨ Very rarely available ¨ Not available	
5.6	Environmental disinfectant(e.g., chlorine, alcohol)	¨ Always available ¨ Sometimes available ¨ Very rarely available ¨ Not available	
5.7	Color coded bins	¨ Always available ¨ Sometimes available ¨ Very rarely available ¨ Not available	

Section-6

Healthcare workers' awareness and knowledge of waste management procedures in their facilities.

Sl no.	Questions	Options	Remarks
6.1	Do you know the waste management protocols in your facility?	¨ Yes ¨ No ¨ I don't know	
6.2	Do you know that laundry and cleaning procedures in your facility?	¨ Yes ¨ No ¨ I don't know	
6.3	Do you know how to dispose medical waste other than sharps boxes in your facility?	¨ Yes ¨ No ¨ I don't know	
6.4	Do you know about the waste segregation process of the facility?	¨ Yes ¨ No ¨ I don't know	
6.5	Do you know if there is coordination between clinical staff and waste management and cleaning staff?	¨ Yes ¨ No ¨ I don't know	

Section-7

Infection Control Training, Competency, and Implementation of Policies

Sl no.	Questions	Options	Remarks
7.1	Is there an infection control team in your facility?	¨ Yes ¨ No ¨ I don't know	
7.2	Triage system in the facility?	¨ Yes ¨ No ¨ I don't know	
7.3	How frequently do healthcare workers receive training regarding IPC in your facility?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
7.4	Did you receive any training in hand hygiene and standard precautions?	¨ Very often ¨ Often ¨ Sometimes ¨ Never	
7.5	Is there any procedure in place for reporting accidental blood and body fluid exposure?	¨ Yes ¨ No ¨ I don't know	

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Original Article

OUTCOME OF COMBINED TAILORED LATERAL INTERNAL SPHINCTEROTOMY WITH ADVANCEMENT FLAP & LATERAL INTERNAL SPHINCTEROTOMY ALONE IN TREATMENT OF CHRONIC ANAL FISSURE

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Keywords:
AAF = Anal Advancement Flap, CAF = Chronic Anal Fissure, LIS = Lateral Internal Sphincterotomy, RCT=Randomized Controlled Trial.

Abstract:

Background: *Anal fissure is a linear tear in the distal anal canal with spasm of internal anal sphincter. Lateral internal sphincterotomy (LIS) is the surgical treatment of choice for chronic anal fissure (CAF). Recently anal advancement flap (AAF) combined with tailored LIS gained popularity as there is rapid healing and relief of pain. In this study, we tried to evaluate the early outcome of combined tailored LIS with AAF and LIS alone in terms of patient's morbidity.*

Methods: *It was a randomized controlled trial (RCT), carried out in the Department of surgery, SSMCMH, Dhaka over a period of 8 months from February 2018 to September 2018. 30 patients of CAF had been chosen purposively and randomized into 2 groups. Control group (A) had 15 patients who underwent LIS alone and Experimental group (B) had 15 patients who underwent combined tailored LIS with AAF. Patients were followed up 3 months after operation*

Results: *Post-operative pain was more Group A 6.53 ± 0.64 compared to 4.87 ± 0.63 in Group B with a* p *value* <0.001. *Post-operative bleeding was observed in 8 (53.30%) patients in Group A whereas no patient in Group B, with a significant p value,* p <0.001. *Post-operative hospital stay was less in Group A, 1.00 ± 0.00 days and 7.47 ± 0.64 days in Group B where p value was also significant,* p <0.001. *Minor pattern of incontinence was more in Group A 4 (26.70%) in comparison with 0 (0.00%) in Group B,* p=0.032 *which was statistically significant. Duration of wound healing was more 35.7 ± 3.31 days in Group A and 7.36 ± 0.49 days in Group B with a significant p value,* p <0.001.

Conclusions: *Combined tailored LIS with AAF appears to produce the rapid healing, improvement of post-operative pain & bleeding, reducing risk of minor pattern of incontinence with few complications.*

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Introduction:

An anal fissure (AF) is a longitudinal split in the anoderm of the distal anal canal, which extends from the anal verge proximally towards, but not beyond the dentate line.[1] AF occurs equally in men and women, 75% of anal fissure are located in the posterior midline. If the fissure is in an atypical location or there are multiple fissures, other

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complicated diseases such as Crohn's disease, trauma, tuberculosis, syphilis, HIV/AIDS, or anal carcinoma should be investigated.[2]

Acute AF is a simple tear or linear ulcers in the anoderm, which occur just distal to dentate line, characterized by severe pain before and after defecation and passage of bright red blood, usually heals within 6 weeks with conservative managements. Chronic anal fissure (CAF) is defined by symptoms present for more than 6 to 8 weeks, can be further characterized by the presence of an anal tag or "sentinel pile" at the distal end of the fissure and a hypertrophied anal papilla at the proximal end near the dentate line.[3]

The main underlying pathology, however, appears to be a high resting anal pressure caused by increased internal anal sphincter tone. Spasm of this muscle reduces the blood flow and the oxygen tension in the skin of the anal canal. The underlying principle of treating AF is to reduce the internal anal sphincter tone. It can be achieved by medical therapy or surgical interventions. Conventional pharmacological treatment uses muscle relaxants, commonly topical drugs. These drugs include nitrates (glyceryltrinitrate), calcium channel blockers, botulinum toxin, alpha-adrenoreceptor antagonists, beta-adrenoreceptor agonists, and muscarinic agonists.[4]

CAF not responding to conservative management, lateral internal sphincterotomy (LIS) may be the better treatment and perhaps the preferable surgical technique.[5] The latest American guidelines are supported by level 1a evidence for LIS due to its high efficiency compared with other therapies, particularly medical treatment.[6] However, the debate on postoperative fecal incontinence remains.

The anal advancement flap (AAF) is an effective method for healing of anal fissure as a primary line of management, it is considered as a good choice for those cases having recurrent AF. In a study reported that outcome of AAF is significantly better when compared with LIS in treatment of CAF in term of less infection and anal continence.[7]

The AAF technique is performed by making a V-shaped incision from the edges of the fissure extending about 4 cm from the anal verge and away from the midline. The V-shaped flap formed of skin and subcutaneous fat was mobilized sufficiently to allow advancement into the anal canal to cover the fissure defect. The base of flap was sutured to the lower anal mucosa.[7] An anal advancement flap is effective in healing an anal fissure as primary line of treatment, also is a good choice for those who have recurrent anal fissures post LIS and is followed by minor complications. Various flaps have been described, such as rotational or V-Y flap.[8] This study is designed to evaluate the results of AAF combined with tailored LIS in comparison with LIS alone in treatment of CAF at our setting.

Methodology

This randomized controlled trial (RCT) was conducted in the department of surgery, Sir Salimullah Medical College Mitford Hospital (SSMCMH), Dhaka from February 2018 to September, 2018, over 8 months. Our study was approved by the institutional review board (IRB), SSMCMH, Dhaka.

30 diagnosed patients of CAF, above legal age of giving their own consent (18 years) were included in the study, purposively and scheduled for surgical management. We excluded the patients with diabetes mellitus, chronic renal failure, pre-existing cardiac problems.

Two group of patients, 15 in each group were allocated by card sampling. The group-A patients underwent LIS and group-B patients underwent combined tailored LIS with AAF. Healing of the wound, hematoma, post-operative bleeding, incontinence, recurrence, severity of pain of both groups was recorded.

All the events of the procedure were recorded by an independent observer. In all cases, patient's data such as age, sex, clinical presentation, postoperative outcome etc. were noted. Patients were followed up 3 months after operation. All the collected data, questionnaire were checked very carefully to minimize errors in collecting data.

Results

In our Study, the mean age of the patients in Group A was 35.13±3.83 years and in Group B was 35.07±4.51years. We found 11 (73.30%) patients of Group A & 13 (86.70%) patients of Group B were male. Four (26.70%) patients of Group A & Two (13.30%) patients of Group B were female. Mean post-operative pain score of the patients as per NPRS which was 6.53 ± 0.64 in Group A & 4.87 ± 0.63 in Group B with a significant p value, $p < 0.05$. Seven (46.70%) patients of Group A & Fifteen (100.00%) patients of Group B didn't suffer from any post-operative bleeding with a

significant p value, $p < 0.05$. One (6.70%) patient of each group had non healed ulcer. 11 (73.30%) patients of Group A & Fifteen (100.00%) in Group B had not experienced any post-operative minor pattern incontinence with a *p* value 0.032. Mean duration of hospital stay was 1.0 ± 0.0 days in Group A & 7.47 ± 0.64 days in Group B with a p value <0.05. Duration of wound healing was 35.7 ± 3.31 days in Group A & 7.36 ± 0.49 days in Group B, p value was < 0.05.

Table-I

Distribution of the patients according to age and sex

		Group			
Particulars		Group A	Group B	Total	P value
Age (years)	20-30	2 (13.30)	3 (20.00)	5 (33.30)	
	31-40	11 (73.30)	11 (73.30)	22 (146.60)	
	41-50	2 (13.30)	1 (6.70)	3 (10.0)	0.966[c]
	Total	15 (100.00)	15 (100.00)	30 (100)	
	Mean±SD	35.13 ± 3.83	35.07 ± 4.51	35.28 ± 8.12	
	Male	11 (73.30)	13 (86.70)	24 (80.00)	0.361[a]
Sex	Female	4 (26.70)	2 (13.30)	6 (20.00)	
	Total	15 (100)	15 (100)	30 (100)	

[c]Unpaired t test was done to measure the level of significant.
[a]Chi-square test was done to measure the level of significant.
Figure within parentheses indicates in percentage.

Table-II

Mean ± SD of the patients according to post-operative pain score (NPRS) by groups

Post-operative pain score as per NPRS	Group A	Group B	P value
Mean ± SD	6.53 ± 0.64	4.87 ± 0.63	<0.001[c]

[c]Unpaired t test was done to measure the level of significant.
Data was expressed as Mean ± SD.

Table-III

Distribution of the study subject according to post-operative bleeding by groups

Post-operative bleeding	Group A	Group B	P value
Present	8 (53.30)	0 (0.00)	0.001[a]
Absent	7 (46.70)	15 (100.00)	
Total	15(100.00)	15(100.00)	

[a]Chi-square test was done to measure the level of significant.
Figure within parentheses indicates in percentage.

Table-IV

Distribution of healing status between two groups

Healing status	Group A	Group B	P value
Non healing	1 (6.70)	1 (6.70)	1.000[a]
Healing	14 (93.30)	14 (93.30)	
Total	15 (100.00)	15 (100.00)	

[a]Chi-square test was done to measure the level of significant.
Figure within parentheses indicates in percentage.

Table-V

Distribution of the patients according to post-operative minor pattern incontinence to liquid & flatus

Incontinence	Group A	Group B	P value
Present	4 (26.70)	0 (0.00)	0.032[a]
Absent	11 (73.30)	15 (100.00)	
Total	15 (100.00)	15(100.00)	

[a]Chi-square test was done to measure the level of significant.
Figure within parentheses indicates in percentage.

Table-VI

Mean ± SD of the patients according to duration of hospital stay by groups

Duration of hospital stay in days	Group A	Group B	P value
Mean ± SD	1.0 ± 0.0	7.47 ± 0.64	<0.001[c]

[c]Unpaired t test was done to measure the level of significant.
Data was expressed as Mean ± SD.

Table-VII

Mean ± SD of the patients according to duration of wound healing by groups & recurrence with in short time (3 months) follow up

Duration of wound healing in days	Group A	Group B	P value
Mean ± SD	35.7 ± 3.31	7.36 ± 0.49	<0.001[c]
Recurrence	Group A	Group B	P value
	0 (0.00)	0 (0.00)	-

[c]Unpaired t test was done to measure the level of significant.
Data was expressed as Mean ± SD.

Discussion

A chronic anal fissure (CAF) is one of the most frequent, benign, proctological disorders in the world and may sometimes affect the patient's quality of life. Recent studies have suggested that decreased blood flow and resulting ischemia of the mucosa are important in the pathogenesis of CAF. The principle aim of treatment of CAF is to reduce the tone of the internal anal sphincter.[4]

Our study design raises a number of important methodological issues, including patient selection, sample size and the prospective evaluation of safety and effectiveness of combined tailored LIS with AAF in CAF patients, all of which may exert a powerful influence on the results. These issues may be particularly relevant for comparative studies that use complication rates as an outcome measure, in which sources of bias may be sufficiently large to either obscure a real difference in rates or create an apparent one. Using our results and previous studies as examples, we shall address these issues in turn.

In this study, patients underwent operation either by combined tailored LIS with AAF or LIS alone mostly belongs to middle age group. This was comparable with the mean age reported in other studies, which range from 30 to 45 years.[4]

Male outnumbered female, male to female ratio was 4:1 in this study. It was consistent with the results observed in other study, male to female ratio of 3.1:1.[9] While other found a less male to female ratio of 1.47:1.[9] In our country female patients were less in number as they are reluctant to seek health care for their problems especially in private parts due to social culture. In our study, we found that most of the patients

of CAF were from lower class & middle-class family.

The mean pain score after operation in Group A was more, 6.53 ± 0.64 than that of Group B, 4.87 ± 0.63 as per NPRS with a statistically significant *p* value, $p<0.05$. Pain was more in Group A. Ulcer remain uncovered after operation in Group A but in Group B all fibrous tissue was excised and ulcer was covered by flap, internal anal sphincter hypertonicity was released in both the techniques. In other study they also found that patients treated with tailored LIS combined with V-Y advancement anal flap didn't suffer from severe pain so less doses for analgesia was required.[8]

We found that post-operative bleeding occurred more in Group A, 8 (53.30%) patients whereas none of the patient of Group B had post-operative bleeding. *P* value was <0.05 which was statistically significant. Post-operative bleeding was more in Group A as after LIS, blood supply in perianal area increased due to relaxation of spasm of internal anal sphincter & the ulcer remained uncovered with an incised wound over the intersphincteric groove.

In our study, difference regarding healing status in both the study groups was found non-significant & result was almost similar. 14 (93.30%) patients of each group achieved complete healing and 1 (6.70%) patient failed to heal the wound within the expected time. Finding was similar to other studies with a healing rate of 100% of all cases in both groups after 6 weeks follow up.[10] There is no difference in unhealed fissure between the two techniques.[11]

Post-operative minor pattern of incontinence to liquid & flatus was more in Group A. 4 (26.70%) patients of Group A complained of incontinence in contrary to 0 (0.00%) patient of Group B with a statistically significant *p* value, $p=0.032$. Findings consistent with result of other study. In a meta-analysis demonstrated that AAF was associated with a lower rate of anal incontinence compared to LIS.[11]

On comparison of hospital stay between two groups revealed that, mean duration of hospital stay was shorted in group A patients 1.0 ± 0.0 days but in case of group B mean duration of hospital stay was higher 7.47 ± 0.64 days. So, operation of CAFs by LIS alone (Group A) is better than combined tailored LIS with AAF (Group B) in the means of post-operative hospital stay. Most of the patients after combined tailored LIS with AAF needed monitoring & care of the wound up to complete healing that was the cause of longer hospital stay.

Mean duration of healing was shorter in group B patients 7.36 ± 0.49 days than in Group A 35.7 ± 3.31 days. In combined tailored LIS with AAF (Group B) wound was healed by primary intention and LIS alone (Group A) ulcer was left there aimed at healing by secondary intention.

In a meta-analysis demonstrates that AAF was associated with a lower rate of anal incontinence compared to LIS, but that there is no difference in unhealed fissure or wound complication rates between the two techniques.[11]

LIS is often claimed to be the gold standard therapy for chronic anal fissures.[12] The latest American guidelines are supported by level 1a evidence for LIS due to its high efficiency compared with other therapies, particularly medical treatment.[6] However, the debate on postoperative fecal incontinence remains. A recent meta-analysis of 22 randomized controlled trials (RCTs) analyzed long term disturbances in continence after LIS and found an overall incontinence rate as high as 14%.[13]

We found some differences between these two methods in our study, some of them were statistically significant but regarding clinical perspective all of them are not significant.

Conclusion:

Combined tailored lateral internal anal sphincterotomy (LIS) with anal advancement flap (AAF) appears to produce the rapid healing, improvement of post-operative pain & bleeding, reducing risk of minor pattern of incontinence with few complications. Present study shows that combined tailored LIS with AAF is associated with similar wound complications as well as a similar rate of unhealed fissures compared to LIS alone.

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Conflict of Interest

None to disclose

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Original Article

CORRELATION OF PRESCRIBING PATTERN OF ANTIHYPERTENSIVE MEDICATION AND JNC8 GUIDELINE IN HYPERTENSION WITH CHRONIC KIDNEY DISEASE IN A TERTIARY CARE HOSPITAL IN BANGLADESH

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Abstract:

Background: *Hypertension is a cardiovascular disease condition. If it is untreated, it may causes severe morbidity and mortality. Hypertension is both a cause and effect of Chronic Kidney Disease (CKD) and affects the vast majority of CKD patients. So effective blood pressure control is necessary. The risk and progression of CKD may reduce by controlling HTN. Control of HTN plays a major role in preventing its progression to end stage kidney disease and death. The objectives of the study were to evaluate the class, dosing schedule of anti hypertensive prescribed in CKD and the percentage of mono therapy and combination therapy.*

Material and methods: *A cross-sectional, observational study conducted in the Department of Pharmacology in collaboration with the Department of Nephrology out patients' Department in Mymensingh Medical College Hospital, Mymensingh.*

Results: *Most commonly used single drug is CCB (13.27%) and most commonly used combination therapy is CCBs + ARB.*

Conclusion: *It is concluded that in CKD with HTN, majority of patients were treated with combination therapy. CCB was found to be the commonest prescribed anti hypertensive in mono therapy and in combination therapy. According to JNC8 guideline majority of the blood pressure (BP) goals were achieved.*

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Keywords:
Anti-hypertensive drugs, Chronic Kidney Disease, Mono therapy, Combination therapy, Prescription pattern.

Introduction:

Chronic Kidney Disease (CKD) is defined as the presence of reduced kidney function (an estimated glomerular filtration rate [eGFR] <60 mL/min/1.73 m² or kidney damage (often indicated by the presence of proteinuria) for ≥3 months' duration. Hypertension (HTN) is defined by the European Society of Cardiology and the European Society of Hypertension (ESC/ESH) as a blood pressure (BP) of ≥140/80 mmHg affects ~ 30% of the general adult population and up to 90% of those with CKD[1]. Hypertension is not a disease but an important risk factor for development of CKD. The risk of development of hypertension is especially related to the elderly people[2]. Now a days CKD is

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globally increasingly prevalent condition and is strongly associated with circumstance of cardiovascular disease (CVD). CKD is a rising health problem and one of the major causes of mortality[3]. The incidence and severity of hypertension may be increased due to a decline in eGFR. On the other hand, CKD is the most common cause of secondary HTN and also an independent risk factor for cardiovascular morbidity and mortality[1]. The mechanisms of HTN in CKD include volume overload, sympathetic over activity, salt retention, endothelial dysfunction, and alterations in hormonal systems that regulate blood pressure (BP). The prevalence of HTN is higher among patients with CKD, progressively increasing with the severity of CKD. Many guidelines discuss the importance of BP control to decrease the progression of renal disease and decrease cardiovascular morbidity and mortality. However, in order to maintain adequate BP, it requires combination of anti hypertensive agents often up to three or four classes. But many clinicians practice their own prescribing pattern according to their clinical experiences. This study is designed to assess the prescribing pattern of anti hypertensive agents among CKD patients to control BP in the outpatient Department of Nephrology in Mymensingh Medical College Hospital. Findings of this study will give some idea about prescribing patterns in Bangladesh.

Method and Materials:

It was a cross sectional descriptive type of observational study. The study was carried out in the Department of Pharmacology & Therapeutics in collaboration with the Department of Nephrology, Mymensingh Medical College Hospital, Mymensingh, during the period from January 2021 to December 2021. All the data were collected from Department of Nephrology, Mymensingh Medical College Hospital, Mymensingh. Data were collected by interviewing the patients and reviewing patients' prescription. Data were collected ensuring the privacy and confidentiality as far as possible. After completion of data collection, data analysis was done using SPSS version 20.

Inclusion Criteria:

- Patient of either sex.
- Patient of adult age group.
- Patient with diagnosed CKD with HTN with or without DM and Cardio Vascular Disease (CVD).
- Willing to be enrolled in the study with informed consent.

Exclusion Criteria:

- Patient not willing to give consent.
- Patients associated with some comorbidity other than DM, CVD, IHD. Other comorbidities were excluded from this study because of those were no or less related with CKD.

Results:

This study was carried out to determine the pattern of drugs used for the hypertension with chronic kidney disease patients attending outpatient Department of Nephrology in Mymensingh Medical College Hospital in Bangladesh. A total of 113 patients coming to outpatient department of MMCH were selected for the study. A cross-sectional descriptive type of observational study was conducted. Finding of the study are presented by graphs and tables.

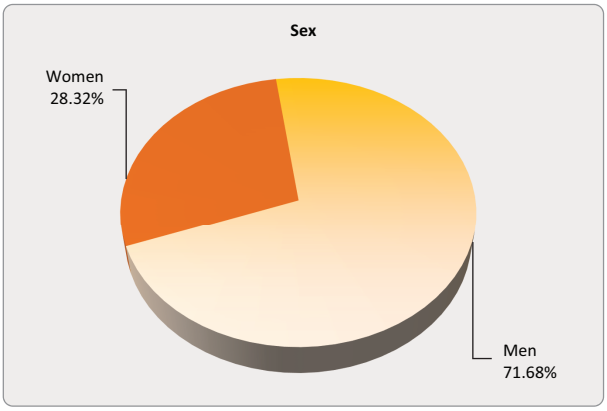

Figure 1: *Sex distribution of patients in CKD with HTN*

Here, majority of the patients suffering from CKD with HTN are males and they cover 71.68% of total patients and 28.32% were female patients suffering from CKD with HTN.

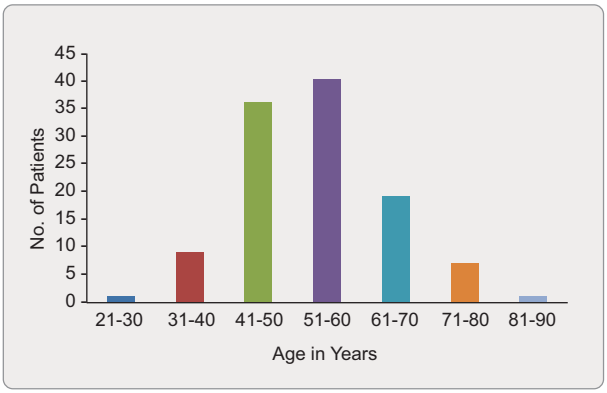

Figure 2: *Age distribution of patients in CKD with HTN*

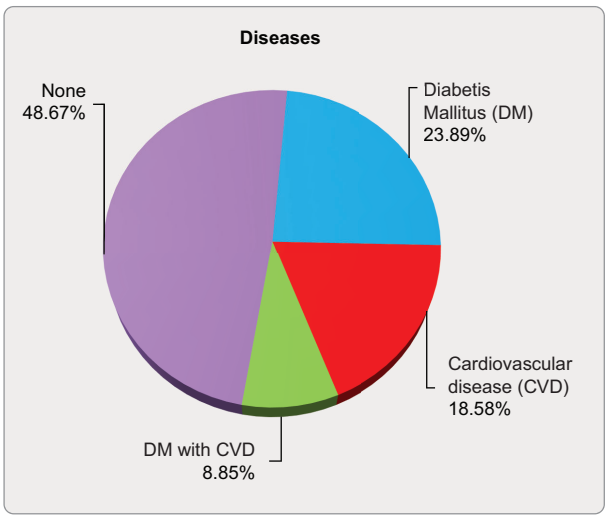

Figure 3: *Comorbidity associated with HTN with CKD*

Out of 113 patients CKD without any co-morbidity was 55 (48.67%), DM 27(23.89%), IHD 21(18.58%), DM with IHD 10 (8.85%).

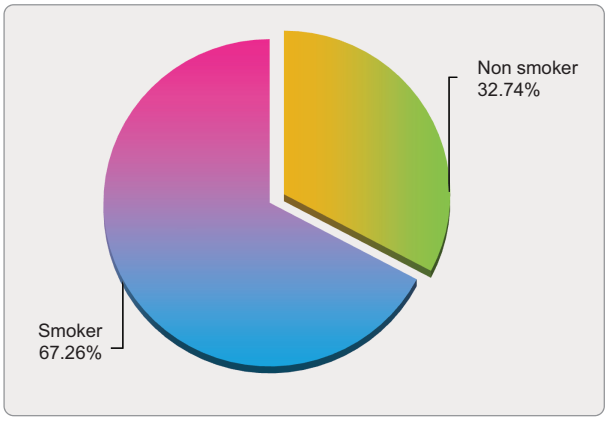

Figure 4: *Personal factor (smoking) of the participants*

Figure 4 shows that all the male patients are smoker.

Systolic Blood Pressure (mmHg)

Table-I

Systolic Blood Pressure (mmHg) of the participants (n=113)

	No. of patients	Percentage	Mean	SD
100-109	60	53.1		
110-130	53	46.9	123.32	7.00
Total	113	100.0		

Table I shows that systolic blood pressure 100-109 mmHg had 53.1% participants and 110-130 mmHg had 46.9% participants

Diastolic Blood Pressure (mmHg)

Table-II

Diastolic Blood Pressure (mmHg) of the participants (n=113)

	No. of patients	Percentage	Mean	SD
60-69	81	71.7		
70-80	32	28.3	80.62	7.11
Total	113	100.0		

Table II shows that Diastolic blood pressure 60-69 mmHg had 71.7% and Diastolic Blood Pressure 70-80 mmHg had 28.3%.

Table III

Distribution of anti hypertensives according to drug prescribed

Drug prescribed	Total number of patients having anti-hypertensive drugs	Percentage
Calcium channel blocker	76	33.48%
Angiotensin II receptor blocker	65	28.63%
Beta blocker	56	24.67%
Alpha blocker	16	7.04%
Diuretics	12	5.29%
Both Alpha and Beta blocker	2	0.88%

Table-IV

Different therapy used in prescription (n=113)

Different therapy	No. of prescription	Percentage
Mono therapy	29	25.66
Combination therapy	84	74.34
Total	113	100.0

Table-V

Anti hypertensive drugs prescribed in hypertension with CKD patients as mono therapy and combination therapy

Name of drugs	Number of patients	Percentage
Angiotensine II receptor blocker + Calcium channel blocker	26	23.01
Calcium channel blocker	15	13.27
Angiotensine II receptor blocker + Beta blocker	14	12.39
Calcium channel blocker + Beta blocker	12	10.62
Calcium Channel blocker + Beta blocker + Alpha blocker	7	6.19
Beta blocker	6	5.31
Angiotensine II receptor blocker + Diuretics	6	5.31
Angiotensine II receptor blocker + Calcium Channel blocker + Beta blocker	6	5.31
Angiotensine II receptor blocker	5	4.42
Angiotensine II receptor blocker + Calcium channel blocker + Beta blocker + Alpha blocker	5	4.42
Alpha blocker	3	2.65
Angiotensine II receptor blocker + Both Alpha & Beta blocker	2	1.77
Angiotensine II receptor blocker + Diuretics + Both Alpha & Beta blocker	2	1.77
Calcium Channel blocker + Diuretics	1	0.88
Calcium channel blocker + Diuretics+ Beta blocker	1	0.88
Angiotensine II receptor blocker + Calcium channel blocker + Diuretics + Beta blocker	1	0.88
Angiotensine II receptor blocker + Diuretics + Beta blocker +Alpha blocker	1	0.88

Discussion

The rationality of the prescription can be assessed and evaluated using a prescription based study, one of the methods available for such purpose. Recommendation of the various international bodies on CKD with HTN has enhanced the prescribing practice of the physicians; moreover, clinical standards are also now available. Prevalence of CKD is on the rise and hence its management is very relevant.[4]So the main objective of the study is to assess the drug prescription pattern of anti-hypertensive in CKD considering the adherence to the JNC-8. According to JNC-8 patients of any age with diabetes or CKD have a goal of less than 140 mm Hg systolic and less than 90 mm Hg diastolic. The focus of the JNC-8 is to target on the BP values. However, it also provides recommendations to promote the safer use of specific anti-hypertensive agents.The objective of the current study was evaluating the prescription pattern for CKD with HTN at a tertiary care hospital. Besides this, the researcher also aimed to assess the pattern of using drugs in the treatment of CKD with HTN, use of drugs as mono therapy or combination therapy, route of administration and patient's knowledge regarding drug schedule. There were no cases of dialysis encountered in the study. This study was conducted in the outpatient Department of Nephrology in MMCH.

This study analysis showed that CKD with HTN occurs more in men than in women, which is confirmed by demographic characteristics showing men to suffer more from CKD with HTN (71.68%) than women (28.32%) which was similar to the study conducted by Prabitha P et al.(2019), Neethu Joseph et al.(2017), and Thomas et al.(2020). Female appear to have protection against CKD and its progression to ESKD.The prevalence of CKD among female population is less in reproductive years and increase about 10 years later than in men. The unhealthy lifestyle and damaging effects of testosterone may lead to rapid deterioration of renal function in males whereas in females estrogen plays a protective role.[5,6,7]

In this study, 35.4% patients were in 51-60 years age group which is similar to the study conducted by Saju AP et al. and which was in contrast with the study done by Neethu Joseph where the age group was 60-69 years of patients were affected more. In the study of Thomas et al. suffered age group was 60-69 years and 50-59 years are more prone to developed CKD.[6,7,8]

This study revealed that tobacco use increases the risk of HTN and CKD which is similar to the study conducted by Neethu Joseph et al. where 50% of the patients were smokers and 67.26% patients were smokers from this study. Smoking seems to be an independent risk factor for development of nephropathy which increases the progression of renal disease. In the present study none of them were addicted to alcohol, which was one of the risk factor in the study conducted by Neethu Joseph[6].

In this study 32.7% of patients had comorbidity of DM 2 which is supported by the study of Kalpana Bharani et al and Thomas et al. which showed DM-2 as major co-morbidity. DM seems to be a most important independent risk factor for development of nephropathy which accelerates the progression of renal disease. In this study 28.3% of patients had cardiovascular diseases which are the risk factor for development of CKD with HTN. Most of them were free from comorbidities (48.67%). In the present study 33.6% of patients had positive family history of CKD and HTN which is increase the risk of development of CKD and HTN.[7,9]

HTN is a strong risk factor for CKD and the existing guidelines recommend strict anti hypertensive treatment. According to KDIGO (Kidney Disease Improving Global Outcomes) guidelines there is no strong evidence to support the preferential use of any class of anti hypertensive except in proteinuric CKD where angiotensin converting enzyme inhibitors (ACE-I)/ ARBs are chosen. In non proteinuric patients targets currently recommended in the general population be extrapolated to those with CKD. In the present study the most commonly prescribed anti hypertensive were found to be CCBs (33.48%) which is similar to the study conducted by Neethu Joseph et al., Thomas et al., Prabitha P et al. and Venkataraman R et al. [5,6,7,10] In this study the 2nd most common drug is ARB (28.63%) and the 3rd common is Beta blocker (24.67%). In this study Diuretic 5.29%, Alpha Blocker 7.04%, and Both Alpha and Beta blocker 0.88% were also used as anti hypertensive.

CCBs do not accumulate in patients with impaired kidney function. The most frequently prescribed CCB in this study was cilnidipine which is a new (fourth) generation DHP. Cilnidipine blocks both L-type/N-type voltage gated calcium channels whereas other DHPs are strictly L-Type CCBs. Cilnidipine significantly reduces urinary albumin creatinine ratio unlike other DHPs which increases proteinuria. Additionally this drug reduces uric acid production without adversely affecting serum uric acid level and reduced urinary uric acid/ creatinine ratio. As hypertension causes sympathetic over activity, reduced nitric oxide production from vascular endothelium due to insulin resistance and this can lead on to unrestricted production of hypoxanthines which are uric acid precursors in the skeletal muscle causing myogenic hyperuricemia. There is no risk of hypotension or reflex tachycardia. Risk of pedal edema is also less with cilnidipine

In this study 74.34% of patients were on multiple drug therapy. Regarding on combination therapy patients were given multi drug therapy which is similar to the study conducted by Thomas et al., Ashok Kumar Malpani et al., Neethu Joseph et al. and Prabitha P et al. But in contrast with the study conducted by D.Giri Rajasekhar et al. however D.Giri Rajasekhar et al. showed mono therapy as most preferred type of therapy.[5,6,7,11,12]Combination treatment is required for hypertension management in CKD according to the guidelines. In this study CCBs combined with Beta blocker 23.01% which is in contrast with the study conducted by Prabitha P et al. where CCBs + AA were frequently prescribed combination as alpha agonists interact minimally with other anti hypertensive and they are valuable as adjunct therapy for resistant hypertension in CKD patients.[5] ARBs were used more regularly than ACE inhibitors may be because of the less tolerability of the latter. In this study 2nd most common combination was ARB + Beta blocker 12.39%. This prescribing trend may be attributed to the goals of anti hypertensive therapy to reduce blood pressure which is the major risk factor for CKD, to reduce the need for hospitalization and to reduce development of ESKD and prevent dialysis.

Conclusion

Hypertension and Chronic Kidney Disease are chronic diseases which are inter related to each other and cyclic in nature. The treatment of CKD is done by treating the associated diseases and associated factors. Treatment for HTN will help in the reduction of chances of development of cardiovascular complications, mortality rate and progression of CKD. Medical records of 113 patients were assessed in this study. The prevalence of CKD with HTN was more in males than in females and majority of the male patients were smokers. Some comorbidity like CVD and DM

were associated with development of CKD with HTN. The preferential drugs applied among the patients were CCBs and the most common CCB was Amlodipine & Cilnidipine followed by ARBs, Beta blockers, Diuretics, Alpha blockers, Both alpha & beta blocker, Centrally acting sympatholytic and vasodilators. This study revealed that multi drug therapy was more preferred than mono drug therapy. In multi-drug therapy dual therapy was the most preferred among the other multi drug therapy. The patients understanding about the disease and the importance of medication could be taking properly. CCBs were found to be the commonest prescribed anti hypertensive as mono therapy and in combination therapy.

Conflict of Interest:
None to disclose.

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Original Article

FEASIBILITY OF LAPAROSCOPIC CHOLECYSTECTOMY IN ACUTE CHOLECYSTITIS WITH OR WITHOUT COMPLICATIONS AFTER 72 HOURS OF ONSET OF SYMPTOMS: OUR EXPERIENCE IN A SUB-URBAN TERTIARY HOSPITAL

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Laparoscopic Cholecystectomy, Acute cholecystitis, Laparoscopic cholecystectomy in acute cholecystitis beyond 72 hours of symptom onset, late laparoscopic cholecystectomy.

Abstract:

Introduction: *Acute cholecystitis has become a fairly common disease in this modern era due to overblown culture of first food chain shops in Bangladesh in the last decade or two. Laparoscopic cholecystectomy is the gold standard treatment of such cases. The traditional method was if 72 hours have elapsed from the onset of symptoms, either conservative treatment was provided or proceed to open cholecystectomy if conservative treatment failed. But now-a-days, due to advancement in the safety measures, instruments and expertise laparoscopic cholecystectomy is the treatment of choice. In our East West Medical College Hospital, we routinely go for laparoscopic cholecystectomy in such cases.*

Methodology: *This is an observational study done in East West Medical College Hospital from January 2022 to December 2024. Total of 355 patients were admitted for laparoscopic cholecystectomy; among them 132 cases with acute cholecystitis.*

Results: *During this study, 132 cases of acute cholecystitis were admitted and all of them underwent laparoscopic cholecystectomy. Among them 126 cases were completed laparoscopically despite per-operative difficulties. Only 6 cases needed conversion to open.*

Conclusion: *In experienced hand and with adequate expertise, in acute cholecystitis cases laparoscopic cholecystectomy is a safer option than conservative despite elapsing 72 hours of onset of presentation.*

Key Words: *Laparoscopic Cholecystectomy, Acute cholecystitis, Laparoscopic cholecystectomy in acute cholecystitis beyond 72 hours of symptom onset, late laparoscopic cholecystectomy.*

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Introduction:

Acute cholecystitis is the acute inflammation of the gallbladder and is mostly associated with gallstone formation, which is about 90-95% of the cases. Often, it causes severe abdominal pain, and if treatment is delayed or left untreated, potentially life-threatening conditions may arise. [1,2] Recurrent attacks of cholecystitis may lead to difficult anatomy, including mucosal atrophy of the gallbladder, thickening of the wall, scarring, and adhesion into the Calot's triangle.[3] Acute cholecystitis is conventionally treated with nothing per oral, intravenous fluids, intravenous antibiotics, and analgesics. After improvement, patients would be sent home with advice for cholecystectomy 6-8 weeks later.[1,4-8] If the conventional treatment doesn't show improvement, then open cholecystectomy is the option.[9] But this traditional operation would end up with larger incision, longer operative time and prolonged hospital stay and recovery time.[10] In the last few decades, with the enormous advancement of laparoscopic surgery and the build of experiences, laparoscopic cholecystectomy has become the choice of treatment in acute cholecystitis, especially when presented within the first 72 hours of the onset of

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symptoms.[10] It has several advantages over the open techniques like wider field of vision during surgery, less postoperative pain, rapid recovery time, cosmesis and early return to daily routine and workflow.[11] But laparoscopic cholecystectomy after 72 hours of onset of symptoms is quite challenging due to inflammatory adhesions, the chance of excessive intraoperative hemorrhage, the presence of complications, experience of laparoscopic surgery, and expertise in difficult cholecystectomy. [4-8] Regarding the feasibility of laparoscopic cholecystectomy in acute cholecystitis, many studies have shown that the success greatly depends on careful patient selection, time of intervention, and, vastly on the expertise of the surgeon.[12,13] In complications of acute cholecystitis like empyema, gangrene, and perforation, conversion to open procedure is sometimes necessary to adequately control the situation and prevent per operative complications. Delayed intervention increases the possibility of conversion to open procedure.[14-18]

In Bangladesh, the incidence of acute calculous cholecystitis has risen in the last decade or two, possibly due to an increase in unhealthy dietary habits, excessive fast-food consumption, and also partly due to an increase in the diagnostic facilities throughout the country. To date, laparoscopic cholecystectomy in acute cholecystitis is highly discouraged, especially when the 72 hours of onset of symptoms have elapsed. In our center, we have been practicing laparoscopic cholecystectomy in all the acute cholecystitis cases despite passing the '72-hour' mark. As a tertiary center, we find that, almost all the acute cholecystitis cases present to us after 72 hours have passed. In this study, we share our three years' experience dealing with the cases of acute cholecystitis laparoscopically passed the '72-hour' mark of onset of symptoms regarding per operative findings, difficulties and completion of the surgery laparoscopically.

Materials and methods

This is an observational study done in the department of surgery in East West Medical College Hospital from January 2022 to December 2024. A total of 355 patients underwent cholecystectomy in that duration, and among them, 132 cases were for acute cholecystitis and its complications. All the patients who were admitted with acute cholecystitis with or without complications of cholecystitis were included in this study. As a tertiary level hospital in a suburban area, we receive the patients after they have already passed the 72 hours of onset of symptoms due to delay in seeking help until the pain worsens, previously visiting and getting unprescribed medicines from pharmacies, visiting non-surgical consultants and receiving oral medications without proper direction, late arrival to our hospital, being referred from a distant hospital and investigative purpose. Patients admitted for elective cholecystectomy, patients with choledocholithiasis and with pancreatitis who needed cholecystectomy, were excluded from the study. Excluding those cases, we received a total of 132 patients with acute cholecystitis who already have passed the '72-hour' mark from the onset of symptoms as our sample size.

After receiving the patients with acute cholecystitis, we routinely proceed for laparoscopic cholecystectomy, and we start counselling our patients from the very beginning. We obtain detailed history, perform complete physical examination and maintain proper documentations. For all the patients, complete blood count, Blood glucose level, S. creatinine, S. alkaline phosphatase, Prothrombin time, ECG, Chest X-ray, and ultrasonography of the abdomen were done routinely. Since admission, the patients with acute cholecystitis were treated with nothing per oral and injectable medications, including cephalosporins.

We have a very expert surgical team comprising of 5 members, three of them already have more than 25 years of experience in the field of laparoscopy and remaining two surgeons have more than 6 years of experience. With proper counselling, consent and preparations, within 48 hours of admission, all the patients underwent laparoscopic cholecystectomy under general anesthesia with conventional four ports. In all the cases, pneumoperitoneum was created with carbon dioxide. A 5 mm or 10 mm 30-degree telescope was used. Conventional laparoscopic cholecystectomy instruments were used. The 'critical view of safety' was targeted to obtain preoperatively. For securing the cystic duct and cystic artery, either a metallic clip or vicryl suture material was used. For all the acute cholecystitis cases, despite bile or stone spillage, normal saline irrigation of the operative field was done routinely, and a right subhepatic drain was placed. The gallbladder was removed through the epigastric port. For large gallbladders, the epigastric port was extended laterally to avoid overstretching. For perforated gallbladders, empyema, gangrenous gallbladders, and spilled stones, an endobag was used to retrieve the gallbladder and/or stones. Ports were closed routinely with prolene 2-0. For extended epigastric ports, the rectus sheath was closed with vicryl 1-0. Patients were discharged on 2nd postoperative day after removing the drain. All the skin stitches were removed on the 7th POD.

For cases needing conversion to open cholecystectomy, the right subcostal incision was made, and a

conventional open technique was used, either retrograde or fundus-first method. For closure of the open wound, No. 1 polydiaxone suture was used with keeping a drain in Morrison's pouch. In the case of obese patients, an extra subcutaneous drain was placed. Drains were usually removed on the 5th to 7th postoperative day, and the patients were discharged. Stitches were removed after the 12th postoperative day.

All the cholecystectomy patients were followed up after 7 days and after one month of discharge from the hospital.

Results

Table I shows that there is female predominance (68%) in acute cholecystitis with 68% of the cases while male is 32%. Highest incidence was observed in the 4th decade (39%) and second most was in 3rd decade (26%). In table II most prevalent diagnosis was acute calculous cholecystitis (43%), among them majority were female (39%). Second and third prevalent causes were empyema (22%) and mucocele (21%) of the gallbladder.

Table III shows per operative most prevalent difficulty was gallbladder adherent to the omentum (28%). Severe adhesion in the Calot's triangle was found in 21% cases.

Table-I

Distribution of the patients according to demography.

	Male (%)	Female (%)	Total (%)
Age			
0 – 10	0 (0%)	1 (0.8%)	1 (0.8%)
11 – 20	0 (0%)	7 (5%)	7 (5%)
21 – 30	8 (6%)	26 (20%)	34 (26%)
31 – 40	18 (17%)	34 (26%)	52 (39%)
41 – 50	13 (10%)	15 (11%)	28 (21%)
51 – 60	2 (1.5%)	4 (3%)	6 (4.5%)
>60	1 (0.8%)	3 (2%)	4 (3%)
Total (%)	42 (32%)	90 (68%)	132(100%)

Table-II

Distribution of the patients according to diagnosis.

	Male (%)	Female (%)	Total (%)
Acute Calculous Cholecystitis	6 (4.5%)	51 (39%)	57 (43%)
Acute Acalculous Cholecystitis	1 (0.8%)	12 (9%)	13 (10%)
Mucocele of the Gallbladder	12 (9%)	15 (11%)	27 (21%)
Empyema of the Gallbladder	19 (14%)	10 (8%)	29 (22%)
Gangrene of the Gallbladder	4 (3%)	2 (1.5%)	6 (4.5%)
Total (%)	42 (32%)	90 (68%)	132 (100%)

Table-III

Distribution of case according to intraoperative difficulty / complications during laparoscopic cholecystectomy.

Difficulty / complication	Number of cases (%)
Gallbladder perforation and bile leakage	21 (16%)
Tearing of gallbladder wall and spillage of stones and bile	12 (9%)
Bleeding from the accessory cystic arteries or collateral vessels around the Calot's triangle	5 (4%)
Adhesion with omentum	37 (28%)
Duodenum drawn up towards the gallbladder	26 (20%)
Severe adhesion with duodenum	2 (1.5%)
Cholecystoduodenal fistula	1 (0.8%)
Severe adhesion in the Calot's triangle	28 (21%)
Dilated cystic duct which was not suitable for metallic clipping.	11 (8%)
Total (%)	132 (100%)

[Figure 1] Duodenum was found drawn up in 20% of the cases. In our study the conversion to open procedure from laparoscopic cholecystectomy in acute cholecystitis cases was only 4.5% as shown in table IV.

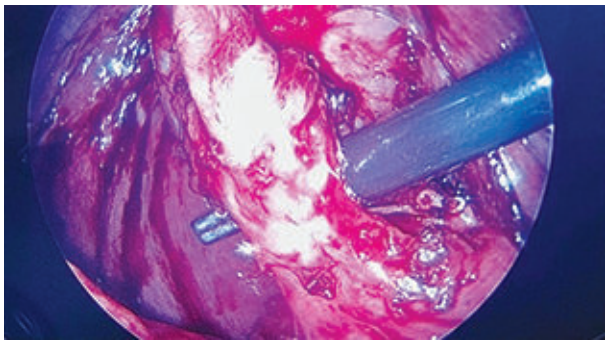

Figure 1: *Difficult Calot's triangle with short and wide cystic duct.*

Table V shows the causes of conversion to open procedure from laparoscopic cholecystectomy. Severe adhesion to duodenum and severe adhesion into the Calot's triangle were found in 2 cases each. There was one case where excessive bleeding from collaterals around the Calot's triangle and one case where there was cholecysto-duodenal fistula. Table 6 shows the average hospital stay was 3.5 days in laparoscopically completed procedure, whereas the average hospital stay was 7.5 days in conversion to open procedure in acute cholecystitis cases. Table 7 shows that the post-operative complications of laparoscopic cholecystectomy in acute cholecystitis were 9%, all of which were port site infections.

Table-IV

Distribution of cases according to conversion to open cholecystectomy.

Cholecystectomy completed laparoscopically	Cholecystectomy converted to open	total
126 (95.5%)	6 (4.5%)	132 (100%)

Table-V

Distribution of Laparoscopic cholecystectomy converted to open according to cause.

Cause for conversion to open	Numbers
Excessive bleeding from collaterals around the Calot's triangle couldn't be controlled laparoscopically	1
Severe adhesion to duodenum	2
Cholecystoduodenal fistula	1
Severe adhesion into the Calot's triangle	2

Table-VI

Distribution of cases according to hospital stay.

Laparoscopic Cholecystectomy in acute cholecystitis (average in days)	Conversion to open procedure in acute cholecystitis (average in days)
3.5 days	7.5 days

Table-VII

Distribution of cases according to post operative complications.

Post operative complications	Numbers (%)
No complications	120 (91%)
Port site infection	12 (9%)
Total (%)	132 (100%)

Discussion

In our study, all the cases that we received were beyond 72 hours of onset of symptoms of acute cholecystitis. There were multiple reasons behind this. Delay in seeking help until the pain worsened, previously visiting and getting unprescribed medicines from pharmacies, receiving self-medication without proper direction, late arrival to our hospital, being referred from a distant hospital, and investigative purpose from the patients' interest. Delayed arrival at the hospital while trying to manage from a local pharmacy or self-medication was the most frequent one. Also, patients not visiting the surgeon in the first place rather than the other specialty contributed to the delay. Even after arriving at the hospital, investigative procedures and sometimes patients' delaying in consent were routinely observed.

The surgeons who operated were experts in both laparoscopic surgery and dealing with difficult gallbladders. All the cases of acute cholecystitis underwent laparoscopic cholecystectomy despite late presentation beyond 72 hours of the onset of symptoms. We have found that most of the cases had acute calculous cholecystitis (43%) with female predominance (39%) which does coincide with some previous studies. [1, 19, 20]

Among the cases we observed adhesion of the gallbladder with the omentum in 28% cases and severe adhesion into the Calot's triangle in 21%, duodenum drawn up in 20% cases. During the maneuver, in 16% of the cases, the gallbladder became perforated and bile leaked, and in 9% of cases, the gallbladder was torn and stones spilled due to friable tissues. We observed 8% of the cases with dilated cystic duct, which was not suitable for clipping, intracorporeal suturing with 3-0 Vicryl was performed. Also, we observed excessive bleeding from accessory cystic arteries or collateral vessels around the Calot's triangle in 4% of cases. Despite all the difficulties during operation, only 4.5% of the cases were converted to open procedures, mostly due to difficult anatomy. Several studies recommended avoiding laparoscopic cholecystectomy in delayed presentation due to potential difficulties from severe inflammation.[13,21,22,23]

According to Rothman et al., the conversion rate was 1.8 to 27.7% through literature reviews.[24] It is 6% reported by Sippey et al. and 22.5% by Terho et al., mostly due to severe inflammation and difficulty in identification of anatomy.[25,26] Singh et al. reported a conversion rate of 0.42%.[27]

We observed 9% of cases with postoperative laparoscopic port site infection, which coincides with several other studies. [28-30] The port infection cases were treated with regular dressing and oral antibiotics.

Limitations

In our study, we were unable to compare the cases with a group that received laparoscopic intervention within the 72- hours of the onset of the symptoms. In some studies, arguments were made of using C-Reactive Protein (CRP) level as an indicator where the operation could be completed laparoscopically or not. We did not routinely measure CRP for cost effectiveness.

Conclusion

In our study we have found that laparoscopic cholecystectomy in acute cholecystitis beyond 72 hours of symptom onset is feasible as the surgical team was expert in laparoscopic surgery and had experience in difficult cholecystectomies. The conversion rate to open procedure was acceptable and also the post operative complication was minimal despite the delayed interventions.

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Original Article

HEALTH-RELATED QUALITY OF LIFE AMONG PATIENTS RECEIVING HEMODIALYSIS AT A SELECTED HOSPITAL

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Abstract:

Background: *Last stage of renal disease patients get hemodialysis as treatment. These patients may suffer lots of physiological and psychological side effects which may affect their life. Objectives: The aim of the study was carried out to assess the quality of life in chronic kidney disease (CKD) patients who received hemodialysis.*

Methods: *The present study was a cross sectional analytic study and conducted among 102 hemodialysis patients from Kurmitola General Hospital from October 2023 to September 2024, Dhaka. This study was using two questionnaires first one was socio-demographic questionnaire and other was the Health-Related Quality of Life scale (HRQOL-BRRIF). The data were collected and recorded in structured questionnaire by the researcher herself. For statistical analyses t test and Pearson Product-Moment Correlation test were performed as applicable using SPSS for windows version 23.*

Results: *In this study, 102 hemodialysis patients their mean age were 54.00±9.833 years. Among them 68 (66.7%) were men and 74 (33.3%) were women. Among the patients, 40 (39.2%) reported having a good quality of life, while 62 (60.8%) had a bad quality of life.. This study revealed that, age (p=.000) and marital status (p=.008) were found to be significant association with the quality of life among participants. This study found that the quality of life of dialysis patients is highly correlated with a number of demographic characteristics.*

Conclusion: *This study revealed that most of the hemodialysis patients had low quality of life. Present study highlights several factors that healthcare policymakers and clinicians should consider to improve the quality of life of patients receiving hemodialysis.*

Keywords:
Quality of life, Hemodialysis, Chronic kidney disease CKD.

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Introduction:

Health-related quality of life (HRQoL) is a complex perspective that is used to find out a person's present health status. An individual's physical, mental, and social well-being are all taken into consideration, making HRQoL which is a useful indicator of general health[1,2]. The HRQoL is reduced in chronic kidney disease patients than in normal people. Chronic kidney disease is a very common disease worldwide and causes problems in public health[3,4]. In late stage CKD who receive dialysis has a lower health-related quality of life[5]. Patients undergoing dialysis may have a variety of physical and mental adverse effects from the condition and related therapies, which could change their way of life and reduce their HRQoL[5].

Chronic kidney disease (CKD) affects 10–15% of people worldwide[6]. During the last three decades, the incidence of kidney illness has increased by 88% (from 11 to 21 million), the prevalence by 87% (from 147 to 275 million), the death rate by 98% (from 0.6 to 1.2

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million), and the disability adjusted life years by 62%[7]. The majority of patients, including 86.8% in 2010 and 90.6% in 2018, selected hemodialysis as their first dialysis option. One of the biggest challenges in Asian countries is estimating the precise incidence and prevalence of dialysis populations. Dialysis patients have become between 0.1 and 0.2% of the population in affluent Asian nations including Taiwan, Korea, and Japan[8]. An estimated 35,000 to 40,000 individuals in Bangladesh suffer from end-stage kidney disease (ESKD) annually. However, most end-stage renal failure (ESKF) patients lack access to renal replacement treatment (RRT) but the current hemodialysis (HD) facilities can only handle 9000–10,000 new patients per year. Between 2010 and 2018, the prevalence of dialysis rises significantly, but the age-standardized prevalence of dialysis was constant[9].

Older age, lower socioeconomic status, and malnutrition are clinical and demographic traits associated with a lower HRQoL in hemodialysis patients. Observational studies have shown that certain sociodemographic characteristics, including female sex, advanced age, lower employment, and marital status, are associated with reduced HRQoL in patients with end-stage kidney disease. The HRQoL of patients with end-stage kidney disease is significantly influenced by the duration of their hemodialysis sessions. Anemia and severe malnutrition are two biological variables that are linked to a decreased HRQoL. Anxiety and depression are psychological conditions that have been associated with lower HRQoL[10].

Hemodialysis individuals with chronic renal disorders may experience significant psychological effects[11]. End-stage renal disease affects patients' life profoundly and is a terrible, irreversible ailment. It has detrimental impacts on the patients' economical, psychological, and physical well-being, among other areas of their existence. HRQoL is still a major issue for hemodialysis patients, despite great advancements in the treatment of end-stage kidney disease (ESKD) patients. Medical and nonmedical expenses paid by the patient during the course of the illness have a significant negative economic impact on HRQoL in poor nations such as Bangladesh. The cost of medication, laboratory testing, and hospital stays are the primary components of medical expenses. In contrast, nonmedical costs include the price of travel, lodging, and other out-of-pocket expenditures during the treatment[12].

Methods and Materials

Hemodialysis patients' health-related quality of life was evaluated using a cross-sectional study methodology from October 2023 to September 2024 conducted in Kurmitola General Hospital (KGH), Dhaka.

The study population consisted of 102 hemodialysis patients aged over 30 who were receiving treatment at both indoor and outdoor department at the Kurmitola General Hospital, Dhaka for at least six months due to chronic renal disease.

After selection of the subjects, the nature, purpose and benefit of the study were explained to each subject in details. They were encouraged for voluntary participation. The instruments of this study had two parts. Part I: Socio-demographic characteristics questionnaire: The socio-demographic characteristics questionnaire included the details of patients' related information such as: age, sex, religion, education, occupation, number of children, monthly family income, and type of residence. Part II: Quality of life related questionnaire: The World Health Organization (WHO) developed a quality-of-life instrument, the WHOQOL in 1996, which is a self-reporting tool that designed many subjective aspects of quality of life. The World Health Organization Quality of Life Brief Version (WHOQOL-BREF) is a questionnaire that measure a person's quality of life. It was developed by World Health Organization (WHO) on 1998 and WHO has given a free access permission to use the instrument. It helps to measure physical health, psychological health, social relationship, environmental health[13]. Each item is scored on a scale of 1 to 5, mean score for each domain is calculated, the mean domain is multiplied by 4 to create a scaled score. Total 26 questions are present & higher score indicates a higher quality of life. Total score was ranging from 26 to 130. A value of 60 is considered as an optimal cut off point for assessing low versus high quality of life and satisfaction with health (World Health Organization, 1998). Total score was made by computing score of all individual items. Then the total score was categorized as low and high quality of life. After completion of data collection, data was checked and verify to identify missing data and minimize the error. Data was analyzed in computer by using Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics such as frequency,

percentage, mean, and standard deviation was used to describe the sociodemographic characteristics of hemodialysis patients. Inferential statistics such as t-test and Pearson Product-Moment Correlation were used to examine the relationship between demographics characteristics and health related quality of life among hemodialysis patients.

Results

The findings of the study including describes the socio demographic characteristics of patients receiving hemodialysis; describes the level of health related quality of life among patients receiving hemodialysis and finally explains the relationship between the socio demographic characteristics of patients receiving hemodialysis and their health related quality of life.

Part A: Distribution of socio-demographic characteristics of patients receiving hemodialysis.

Figure 1 showed the socio-demographic characteristics of the study participants. A total of 102 patients receiving hemodialysis were enrolled in this study. Their mean age was 54.00±9.83 years with range from 34 to 79 years. More than half (56.9%) of them are in the 50-65 years' age group.

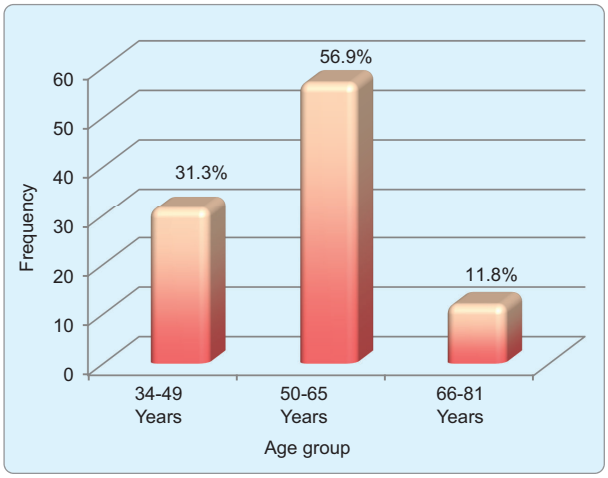

Figure1: *Distribution of respondents by age group (n=102)*

Table-I

Distribution of respondents by gender (n=102)

Variables	Categories	Frequency	Percentage (%)
Gender	Male	68	66.7
	Female	34	33.3

Table I shows that out of 102 participants' majority 66.7% of them were male and rest of the participants 33.3% were female.

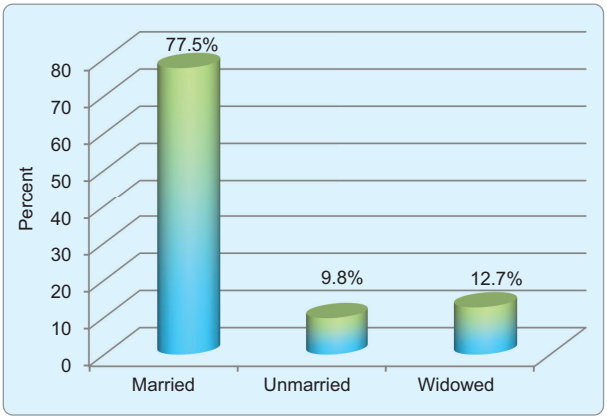

Figure 2. *Distribution of respondents by Marital status (n=102)*

Figure 2 shows that out of 102 participants most 77.5% of them were married, 12.6% were widowed and only 9.8% were unmarried.

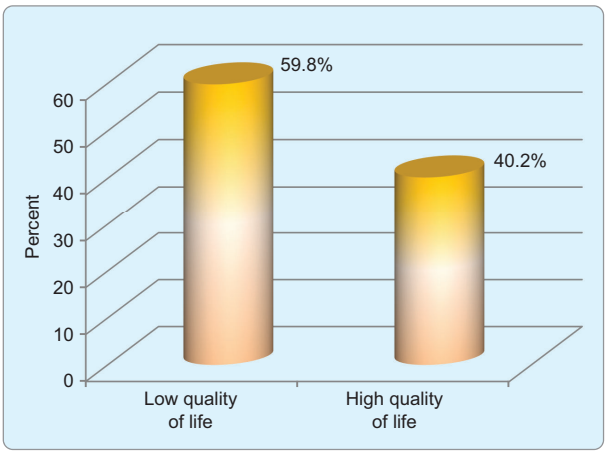

Figure 3: *The level of health related quality of life among patients receiving hemodialysis (n=102)*

Figure 3 Showed a total of 102 patients receiving hemodialysis were enrolled in this study. The majority (60.8%) of participants have low quality of life and rest of the participants 39.2% have high quality of life.

The table II stated the relationship between the socio demographic characteristics of patients receiving hemodialysis and their health related quality of life.

Findings revealed that, age (r=-.785, p=0.000) were found to be significant association with the quality of life among participants but gender (t=-.1.683, p=0.079)

Table-II

Relationship between the socio demographic characteristics of patients receiving hemodialysis and health related Quality of life (n=102)

Variables	Categories	r	*P* Value
Age (Years)		-.785	0.000
Gender			-1.683
	Male	61.18±19.594	
	Female	68.94±23.051	
Marital status		5.115	0.008
Married	63.63±20.701		
Unmarried	79.90±16.093		
Widowed	52.77±19.762		

N.B. M=Mean, SD=Standard Deviation, r = Pearson product moment correlation coefficient test, t= Independent sample t test, p =0.05 significant value.

was not associated with the quality of life. Again, findings revealed that, marital status (F=5.115, p=0.008) were found to be significant association with the quality of life among participants.

Discussion:

Hemodialysis patients' quality of life is negatively impacted in comparison to the general population and other medical illnesses. A person's incapacity to perform everyday tasks, inability to focus entirely on them, financial difficulties, lack of support from friends and family, and other health issues all contribute to a decline in their quality of life. Assessing the health-related quality of life of hemodialysis patients at a particular Bangladeshi hospital is the goal of this study.

The sociodemographic attributes of hemodialysis patients. This study involved the enrolment of 102 hemodialysis patients in total. Their average age was 54.00±9.833 years, which is consistent with a few earlier investigations that were carried out in Malaysia and Jordan[14,15]. This result, however, contradicts a prior study carried out in Ethiopia that found the mean age to be 36.8±11.9 years[16]. The majority of participants in this study were men, which is consistent with the results of a few other investigations carried out in Saudi Arabia and Africa[17].

In contrast to the current study findings obtained in Malaysia and Jordan, a few investigations revealed that the majority of participants were female[14,15]. As with earlier studies conducted in Jordan, Malaysia, and Uganda, the majority of participants in this study were married[14,15,19].

In this current study most of participants were married which is congruent with previous several studies in Jordan, Malaysia and Uganda [12].

The extent of health-related The quality of life of hemodialysis patients According to the current study, the majority of participants (60.8%) had a bad quality of life, which is consistent with the results of earlier research conducted in Palestine, Pakistan, Iran, and Jordan[20, 21, 22]. This result, however, differs from the Indonesian study that found that just 32.3% of participants had a negative quality of life[23].

Compared to earlier research conducted in other nations, the low quality of life experienced by hemodialysis patients differs depending on the setting and the scale used to measure quality of life in each nation. Relationship between hemodialysis patients' sociodemographic traits and their quality of life in relation to their health[23].

Age is a major factor that influences the quality of life among patients receiving hemodialysis. In this current study, there was a significant negative correlation between age and low quality of life among hemodialysis patients. From this study, it was evident that the youngest group of patients receiving hemodialysis had a high quality of life compared to the older group. Due to age-related limitations, they are unable to perform household tasks, and even older patients are unable to access proper care from their ailing relatives and health care system which might be influenced by low quality of life. This finding is similar to a previous study conducted in Jordan and Malaysia[14,15]. However, this finding is inconsistent

with one previous study conducted in Ethiopia, which reported that there was no significant relationship between patients' age and quality of life[16].

Conclusion:

This study demonstrated that poor quality of life was significantly more common among hemodialysis patients. Furthermore, certain traits that were proven to be substantially linked to a poor quality of life for hemodialysis patients are identified in the current study. Healthcare officials and physicians should consider these factors to develop timely and effective solutions that will manage chronic renal disease and improve the quality of life for patients receiving hemodialysis.

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Original Article

VARIATIONS IN THE SHAPE OF THE FORAMEN OVALE IN DRY OSSIFIED HUMAN MIDDLE CRANIAL FOSSA- A CROSS SECTIONAL STUDY

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Abstract:

Background: *The foramen ovale acts as the passageway for neurovascular structures which pass from the middle cranial fossa into the infratemporal fossa. The mandibular nerve and accessory meningeal artery passes through this foramen. Foramen ovale is important in functional cranial anatomy. Anatomical awareness of variations in the shape of the foramen ovale in middle cranial fossa are important for the neurosurgeons, who operate in this area, and radiologists who interpret imaging for this area. The study was planned to observe the shape of the foramen ovale. In this study different shapes of foramen ovale were carried out in both right and left middle cranial fossa. Then the results were compared between right and left middle cranial fossa.*

Objective: *To evaluate the different shapes of the foramen ovale.*

Materials & Methods: *A cross-sectional, analytical type study was conducted in the Department of Anatomy of Dhaka Medical College, Dhaka from January 2011 to December 2011. The study materials consists of 117 (one hundred and seventeen) dry ossified human middle cranial fossa.*

Results: *The most frequently observed was ovoid foramen ovale and minimum observed was round. Elongated and kidney shaped were not found. There were difference in shape of the foramen ovale in right and left middle cranial fossa but statistically were not significant ($p<0.05$).*

Conclusion: *This study is of clinical and anatomical significance to medical practitioners in cases of trigeminal neuralgia and in diagnostic detection of tumours and abnormal bony outgrowths. The present study was planned to observe the shape of the foramen ovale to establish a baseline data of our own for future studies and to guide the neurosurgeons and radiologists to adopt appropriate plans for diagnosis and treatment of respective fields.*

Keywords:
Foramen ovale, Shape, Middle Cranial Fossa

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Introduction:

Part of the middle cranial fossa is formed by the cerebral surface of the greater wing of sphenoid bone. Foramen ovale is located in the posterior part of the greater wing. The foramen ovale transmits mandibular nerve, the accessory meningeal artery, lesser petrosal nerve and an emissary vein.[1]

The major factors in the determination of variability of shape of the foramen ovale are thought to be the presence and number of veins that pass through it.[2] It is an important constituent of cranial anatomy with high significance in neurosurgery as it enables access to the trigeminal nerve. Thus knowledge of its position is clinically important in the event of anaesthesia of the mandibular nerve. Foramen ovale is used for various invasive surgical as well as diagnostic procedures such as electroencephalographic analysis of the seizure for patients undergoing selective amygdalo-hippocampectomy, microvascular decompression by percutaneous trigeminal rhizotomy for trigeminal neuralgia and percutaneous biopsy of cavernous sinus tumours etc. The technique of CT-guided transfacial fine needle aspiration technique through the foramen ovale is used to diagnose squamous cell carcinoma,

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meningioma etc. and allows biopsy of deep lesions that would otherwise require open surgical biopsy or craniotomy, thus helping to decrease patient morbidity and significantly decrease the cost involved.[3] Anatomical knowledge of the foramen ovale is important for all neurosurgical procedures involving the trigeminal nerve and administration of anaesthesia in the mandibular nerve. Prior knowledge of the presence of foramen ovale may be important for academic and clinical purpose.[4] Different shapes of foramen ovale were observed and recorded during morphological examination. According to literature review- different author describes the shapes of foramen ovale were oval, circular / round, pyriform / pear shaped, elongated and figure of 8 shaped.[4-7] This cross sectional study has been reported in line with the STROCSS guidelines 2024.[8]

Materials & Methods

This is a cross sectional study where variations in the shape of foramen ovale were investigated in 117 (one hundred and seventeen) dry ossified human middle cranial fossa. The base of skulls was collected from the Department of Anatomy of Dhaka Medical College and other government and non-government medical colleges in Dhaka city. Broken, fractured, or missing parts of the middle cranial fossa of the base of skulls were excluded from the study. All the samples were observed. Then, the results were compared between the right and left middle cranial fossa.

Figure 1: *Photograph showing triangular (arrow marked) foramen ovale.*

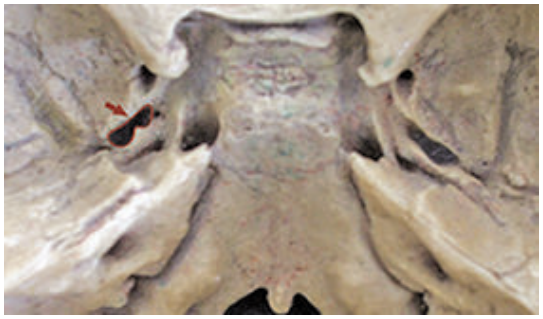

Figure 2: *Photograph showing figure of 8 (arrow marked) foramen ovale.*

Results

For the present study 117 dry ossified human skull with intact middle cranial fossa were studied from different medical colleges of Bangladesh.

Following table indicate the various shapes of foramen ovale.

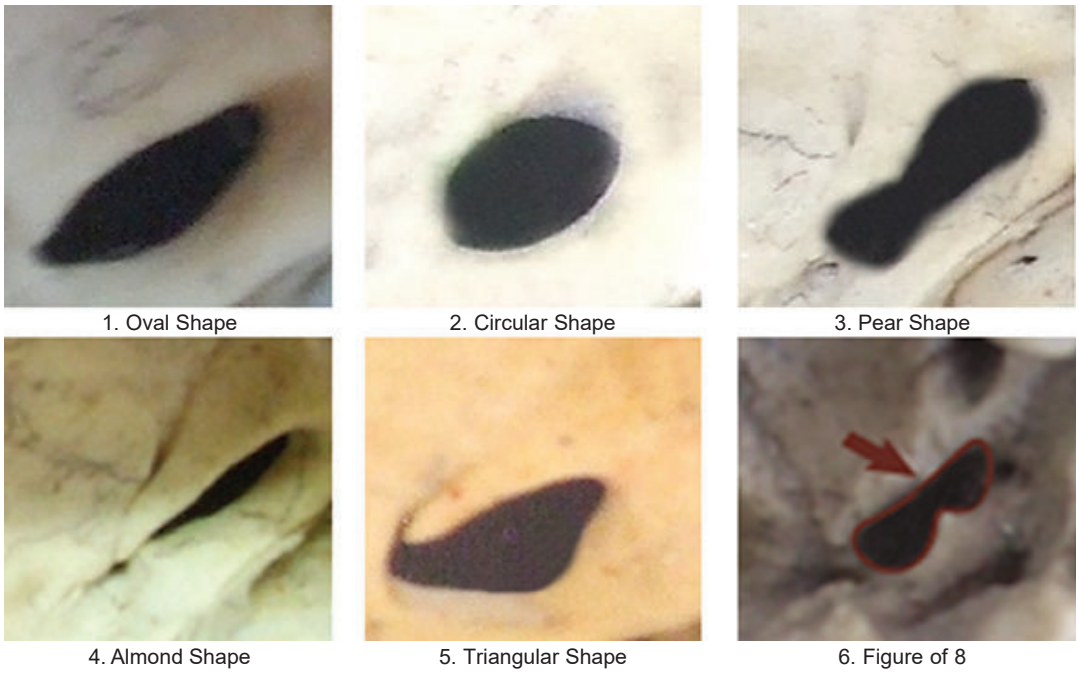

Figure 3: *Different Shape of Foramen Ovale in our study;*

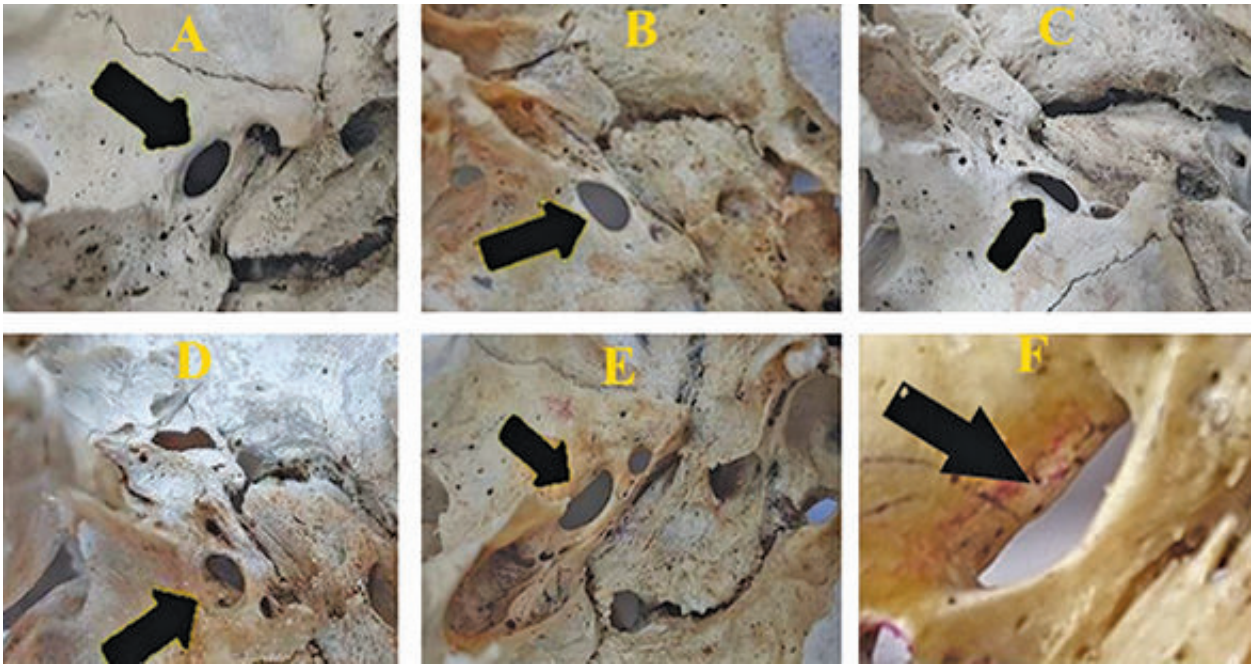

Figure 4: *Different Shape of Foramen Oval; A: Ovoid; B: Almond; C: Kidney Shaped; D: Round; E: Pyriform Shaped ; F: Elongated; Image reproduced for visualization with kind permission from Açikgöz AK et al.* [9]

Table-I

Different Shapes of Foramen Oval (N = 117)

Shape	Right		Left	
	No	%	No	%
Ovoid	96	82.1%	93	79.5
Pyriform	5	4.3	6	5.13
Almond shaped	8	6.8	4	3.41
Round	2	1.7	4	3.41
Triangular	6	5.1	2	1.71
Figure of 8	0	0	8	6.84
Elongated	0	0	0	0
Kidney shaped	0	0	0	0

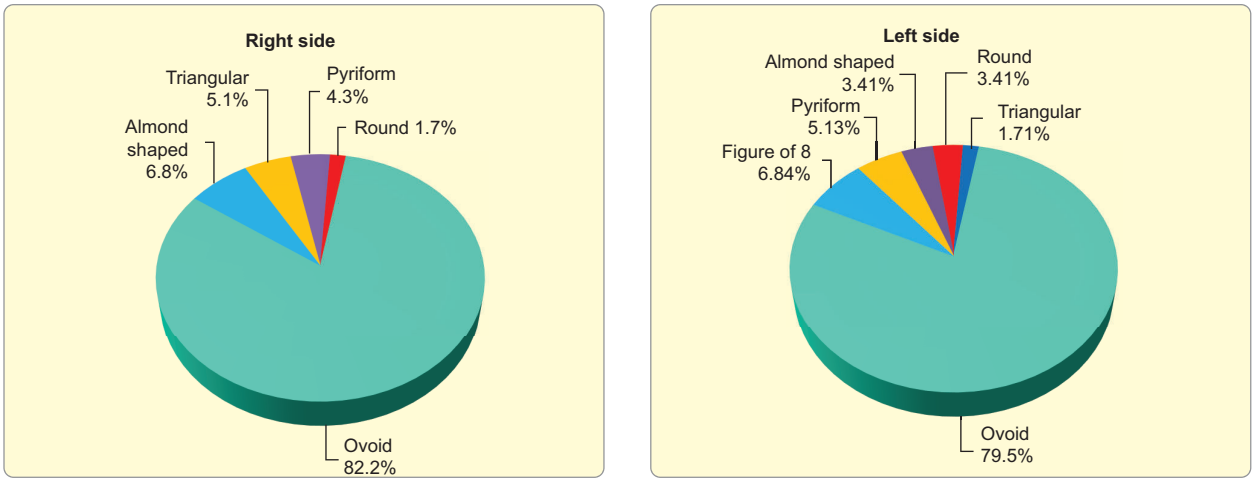

Figure 5: *Different shapes of foramen ovale (Right and Left Side)*

Discussion

The present work was undertaken to study various morphometric variables in 117 (one hundred and seventeen) dry ossified human middle cranial fossa. The findings of this study was statistically analyzed and revealed important information regarding morphometric variations of right and left middle cranial fossa. A comparative discussion of results with that of different authors of abroad is mentioned below. In the present study human skulls were collected from different medical colleges of Bangladesh. The base of skull collected for the present study may or may not be of Bangladeshi people because medical students using skeleton for their study also come from neighbouring countries. The vast majority of Bangladeshis are ethnolinguistically Bengalis, an Indo-Aryan people. Ethnic minorities in Bangladesh are Tibeto-Burman, Chakmas, Austroasiatc and Dravidian people. [10] The results of the study were compared with the studies carried out by different researchers who used base of skull of Indian. By following STROCSS guideline, we have searched in Google scholar, pubmed indexed journal with full article on foramen ovale in our context but unfortunately no single article was found from Bangladesh. There are different articles from this subcontinent. The major ethnic groups in Indian include the Indo-Aryans, Dravidians, Sino-Tibetans, Austroasiatc people and various indigenous tribes. [11] Results of morphological variables showed some similarities as well as dissimilarities with the available information present in the publications, similarities may be due to the same race, and dissimilarities due to racial variation.

An author[3] studied 82 Indian skulls and stated that the oval foramen ovale was common (56.70%) with some bony variations such as spine, tubercles etc. and the incidence of oval, almond shaped, round and irregular shaped foramen ovale were 56.70%, 28.65%, 10.97% and 3.65% respectively. Another author[7] carried out a study using 310 skulls of Indian and found that the shape of the foramen ovale were oval in 299 foramina of right side, 6 foramina were circular, 3 pear shaped and 2 triangular on right side. On left side 297 foramen ovale were oval, 8 were circular, 3 were triangular, 1 was pear shaped and 1 was kidney shaped. They observed the variations of the shape of foramen ovale in the right and left sides were 62.8% and 60% oval in shape respectively. In the present study, foramen ovale was observed most common ovoid shape which is 82.1% on right side and 79.5% on left side which is similar to study done by other authors.[3-7]

Imaging Modalities:

Several imaging techniques are employed for the evaluation of the foramen ovale:

- Computed Tomography (CT): High-resolution CT scans provide detailed bony architecture and are the gold standard for studying foramina variations and pathologies.
- Magnetic Resonance Imaging (MRI): Useful in assessing the neurovascular structures traversing the FO, especially in cases of nerve compression syndromes.
- Cone Beam Computed Tomography (CBCT): Preferred in dental and maxillofacial imaging due to its superior spatial resolution and lower radiation dose.

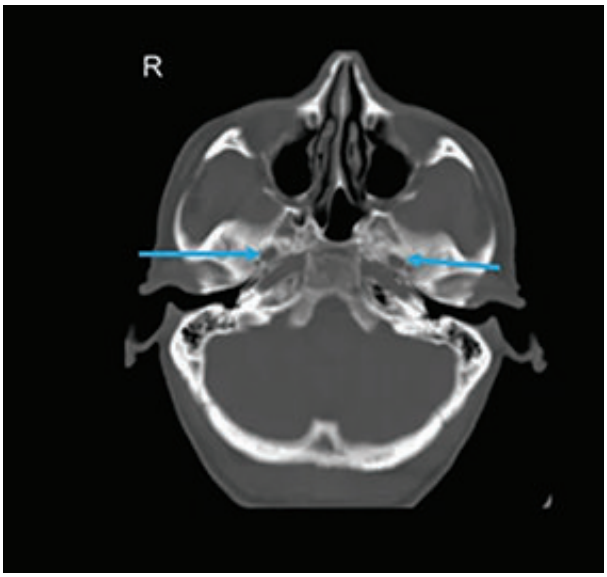

Figure 6: *The foramen ovale in the skull base are normally symmetrical in a CT Scan of Brain Bony Window.*

If a patient's CT scan shows a larger foramen ovale on one side, this could be due to a mass lesion within skull base. In this case, the tumor extended from the cavernous sinus through the foramen ovale which led to its enlargement (Fig. 5). This was much more evident on an MRI with contrast.

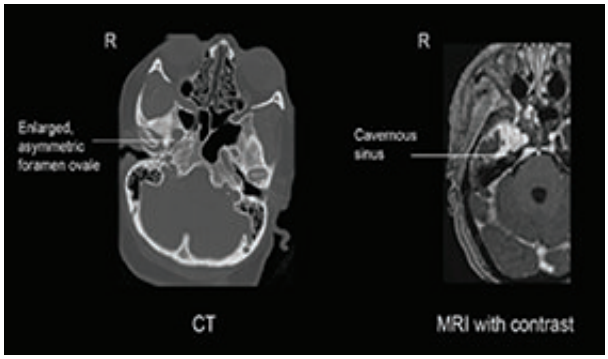

Figure 7: *Due to mass lesion, Foramen ovale is asymmetrical. It is more clear in MRI with contrast than CT Scan of Brain Bony Window.*

Clinical Application of Foramen Oval in Neurosurgery:

The foramen ovale is a critical anatomical structure within the skull base, serving as a passage for the mandibular nerve and accessory vasculature. Its dimensions vary, with an average diameter of 3–9 mm. It is located posterior to the foramen rotundum and lateral to the foramen spinosum. Advanced imaging modalities such as CT and MRI play a crucial role in assessing its morphology and surrounding structures before surgical intervention. Its significance in neurosurgery is underscored by its role in various interventional procedures, including percutaneous trigeminal rhizotomy, microvascular decompression, and tumor resections.

Different Neurosurgical Procedures:

- Percutaneous Trigeminal Rhizotomy

  Trigeminal neuralgia, a debilitating neuropathic pain disorder, is often treated via percutaneous radiofrequency rhizotomy. The foramen ovale provides the entry point for electrode placement, targeting the trigeminal ganglion for pain relief. Fluoroscopic or CT-guided techniques are used to ensure accurate needle positioning.

- Balloon Compression and Glycerol Rhizotomy

  In cases of refractory trigeminal neuralgia, alternative percutaneous procedures such as balloon compression and glycerol rhizotomy are performed via the foramen ovale to selectively damage pain-transmitting fibers while preserving motor function.

- Microvascular Decompression (MVD) and Endoscopic Approaches

  While MVD is traditionally performed via a posterior fossa approach, recent advancements in endoscopic techniques have explored the foramen ovale as an access route to address vascular compression of the trigeminal nerve. This minimally invasive approach reduces surgical morbidity.

- Tumor Biopsy and Skull Base Surgery

  Neoplasms such as meningiomas, schwannomas, and metastatic tumors in the vicinity of the foramen ovale require precise neurosurgical intervention. Fine-needle aspiration or biopsy through the foramen ovale is a valuable diagnostic and therapeutic option.

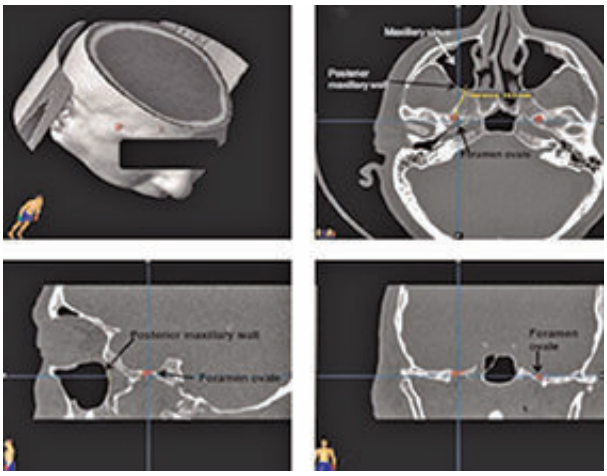

Figure 8: *Pre-operative computed tomography screencapture images showing including (a) three-dimensional reconstruction, and (b)axial, (c) sagittal and (d) coronal views showing theforamen ovale marked in pink. The position of themaxillary sinus and the posterior maxillary sinus wallare shown. Measurement of the distance from theposterior maxillary sinus wall to the foramen ovale isshown in part (b). A = anterior; P = posterior; R =right, L = left; H = head;* [12]

Risks and Complications in surgical practice:

Procedures involving the foramen ovale are not without risks. Potential complications include:

- Injury to the mandibular nerve, leading to dysesthesia or motor dysfunction
- Hemorrhage due to injury to adjacent vasculature
- Infection and cerebrospinal fluid (CSF) leakage
- Incorrect needle placement causing intracranial complications Advancements in imaging and navigation techniques have significantly reduced these risks.

Future Directions for clinical applications:

Innovations in robotic-assisted surgery, augmented reality-guided navigation, and endoscopic techniques

continue to enhance the precision and safety of procedures utilizing the foramen ovale. Further studies exploring patient-specific anatomical variations and optimizing access techniques will contribute to improved outcomes in neurosurgical practice. Furthermore, anthropometric points of foramen ovale may add forensic investigations in different subjects.[13,14]

Conclusion

Foramen ovale is of great surgical importance in the neurosurgery. The knowledge of it is important in procedures like purcutaneous trigeminal rhizotomy for trigeminal neuralgia, transfacial needle aspiration technique in perineural spread of tumor and electroencephalographic analysis for seizure. It is observed by reviewing existing literature that many works have been done on foramen ovale in other countries. So far it is known that there is no published article on the morphometric study of foramen ovale in our country. The findings of this study might be useful in providing data that can be used in diagnosis and treatment of various diseases and help in medical practices of neurosurgeons and radiologists.

Ethical clearance

The study was approved by the Ethical Review Committee of Dhaka Medical College, Dhaka.

Conflict of Interest: None to disclose.

Limitation of Study: Study is limited as per design of a cross-sectional study. The size of the foramen ovale was not evaluated in different shapes, which may aid more data for further research in clinical application. Further study is required in our context to compare the findings of this study and recommend clinical applications.

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Original Article

ASSESSMENT OF SERUM LACTATE AND CREATININE KINASE TO EVALUATE MITOCHONDRIAL DYSFUNCTION IN AUTISTIC CHILDREN

Karim M[1], Shahjadi S[2], Awaul MR[3], Karim F[4]

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Abstract:

Background: *Mitochondrial dysfunction and autistic spectrum disorders (ASDs) are closely related with each other. It has also been mitochondrial dysfunction causes impairment in cellular function which may lead to lack of social communications, language deficits and abnormal energy metabolism in autistic spectrum disorder. These are associated with laboratory evidence of lowered mitochondrial function.*

Objective: *To observe the mitochondrial dysfunction and assess serum lactate and CK to in children with autistic spectrum disorder.*

Methods: *This case-control study was conducted in the Department of Physiology of Bangladesh Medical University (BMU), Shahbag, Dhaka from January, 2013 to December, 2013. For this study a total number of 100 male children with age range 3-8 years were randomly selected, among which 50 were normal children and 50 were diagnosed autistic children. The autistic children were selected from the Parent's Forum, Directorate Generals of Health Service (DOHS), Mohakhali, Dhaka and normal children were selected from some normal school. Serum lactate and creatine kinase (CK) were estimated in all children by standard laboratory method. For statistical analysis independent sample't' test were done as applicable.*

Result: *The mean of both the measured biochemical parameters were found significantly higher ($p<0.001$) in autistic spectrum disorder children. In addition, elevated levels of serum lactate and CK were found in 94% and 32% of autistic children respectively.*

Conclusion: *The result of this study revealed that mitochondrial dysfunction may occur in children with autistic spectrum disorder. The severity of the autistic spectrum disorder is directly related to the biochemical abnormality for mitochondrial dysfunction.*

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Keywords:
ASD, Mitochondrial dysfunction, Lactate, Creatine kinase

Introduction

Autism is a neurodevelopmental disorder which is associated with altered communication of a person. It usually appears within first three years of life.[1] Autism is a generalized term for a group of complex brain disorder having feature of impaired social interaction, verbal and non-verbal communication, repetitive and restricted behavior.[2] There is no boundary for these disorders occurrence, these affect all races, class, religion in all country.[3] Autism can occur due to dysfunction of mitochondria and abnormal brain bioenergetics.[4] Autistic spectrum disorders manifest disruption in multiple high energy organ system like central nervous system, muscular and gastrointestinal systems due to dysfunction of mitochondrial which lead to cellular function impairment.[5] A recent study

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revealed that 80% children with autistic spectrum disorder may have mitochondrial dysfunction.[6] Altered clinical, biochemical or neuropathological evidence of mitochondrial function can be associated with autism spectrum disorders and recent studies regarded mitochondrial disorders as a common metabolic disease in autistic children.[7] Classical mitochondrial diseases usually caused by genetic or respiratory pathway abnormalities. [8] Mitochondrial activity can be impaired by genetic mutation, cerebral folate deficiency, vitamin B6 or iron deficiency and also certain environmental toxin such as pesticides or heavy metals chemicals reduces mitochondrial activity.[9,10] Mitochondrial disorder is primary which may be due to direct genetic involvement that impairs ATP production and secondary which involved in metabolic abnormalities that impair ATP production ability of mitochondria.[11,12] In mitochondrial dysfunction excess ROS are produced and cells are more vulnerable to oxidative stress and damage from mitochondrial ROS.[13] Brain has high rate of oxygen consumption which lead to generation of ROS. Brain is very vulnerable to oxidative damage because of relatively low levels of antioxidants and antioxidant enzymes. In mitochondrial dysfunction reactive oxygen species level increase along with decrease energy level. [14] Mitochondrial disorder leads to impairment in neuronal function, imbalance in excitatory- inhibitory neurotransmitter and reduce neurotransmitter release in GABAnergic (gamma amino butyric acid) interneurons that have high firing rates and the programming of neurotransmitter also affected leading to long-term behavioral effects like autism. [15,16] The mitochondrial disorders are based on clinical, biochemical, molecular and histological findings. Biochemical parameters for mitochondrial dysfunction include increased serum lactate and creatine kinase (CK).[5,6] Several studies reported abnormal level of serum lactate and CK in autistic children.[1,17-23]

Autistic spectrum disorder children with mitochondrial dysfunction show impaired TCA cycle due to some enzyme deficiency, abnormal nutrients metabolism or nutritional deficiency. Impaired TCA cycle stops aerobic respiration which initiates anaerobic respiration causing increased level of lactate.[17]

In mitochondrial dysfunction decrease cellular ATP level causes impairment in Na+-K+ ATPase pump and cell volume cannot be maintained. It leads to loss of cellular integrity of certain organ such as muscle, brain and liver. Thus, creatine kinase level increase. [18,19,24]

In USA, serum lactate and CK found increased in 76% and 28% of autistic children compared to normal children. [24] Some researchers showed that serum lactate level increased in 35% of autistic children.[1] Again, another study found elevated plasma lactate level in 17% of autistic children.[25] Similarly, in 76.7% autistic children increased serum lactate levels were reported in another study.[20]

Methods

This case control study was conducted in the Department of Physiology of Bangladesh Medical University (BMU), Shahbag, Dhaka from January, to December, 2013. Total 100 male children with age range 3-8 years participated in this study. Fifty autistic children diagnosed by psychiatrist according to Childhood Autism Rating Scale (CARS)[26] taken from the Parent's Forum, Directorate Generals of Health Service (DOHS), Mohakhali, Dhaka and fifty control children was selected from some normal school. After selection of the subject, thorough information was given to their parents about the objective and study procedure. Their parents were encouraged for voluntary participation of their children. When their parents were agreed for participation then an informed written consent was obtained from their parents. The protocol of this study was approved by the Institutional Review Board of BMU. Children with epilepsy, turner syndrome, down syndrome and any kind of medication were excluded from this study. The parents of all subjects were requested to attend the Department of Physiology of BMU, Dhaka at 9:00 AM for examination of their children. Detail personal, medical, family, socioeconomic and dietary histories of the children were recorded in a data schedule. Thorough physical examinations of the subjects were done. Anthropometric measurement including height and weight was taken and BMI was calculated. Then under aseptic precaution, 5 ml of venous blood were collected from ante-cubital vein from each subject of both groups for estimation of biochemical test. Serum lactate level was measured in the laboratory of the Department of Biochemistry, BIRDEM General Hospital by colorimetric method. Serum creatine kinase (CK) level was measured in the laboratory of the Department of Biochemistry, BMU by auto analyzer using kit from IFCC (International Federal Clinical Chemistry). Data were expressed as mean + SE and also in percentage. Statistical analysis was done by

using SPSS for windows version 16. Independent samples't' test was used as the tests of significance as applicable. P value <0.05 was accepted as significant.

Results

All the subjects of this study were age and BMI matched (Figure 1).

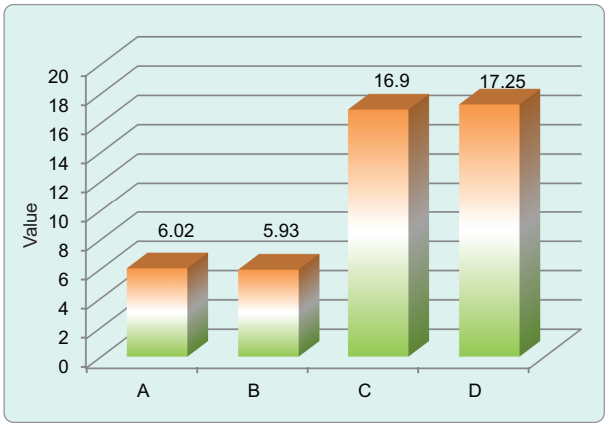

Figure 1: *Mean Age (years) and Body mass index (BMI) (kg/m2) of study subjects.*

In this study mean values of serum lactate and CK levels were significantly higher (p<0.001) in autistic children in comparison to that of normal children (Table I). Abnormally higher level of serum lactate and CK were found in 94% and 32% respectively in autistic children. No control children had elevated levels of these parameters (Table II).

Group A Apparently healthy children (control group)

Group B Autistic spectrum disorder male children (study group)

Table-I

Serum lactate and CK of both groups (n= 100)

Variables	Control (n=50)	Autistic (n=50)
Serum Lactate (mg/dl)	12.10 ±0.34 (8-17)	29.31±1.32*** (16-56)
Serum CK(U/L)	134.76+ 5.69 (67-230)	187.30+11.89 (70-456)

Data are expressed as Mean ±SE. Independent student't' test was used for statistical analysis. Figures in parentheses indicate ranges. ***p ≤ 0.001.

Table -II

Frequency of elevated levels of serum lactate and CK of study subjects.

Variables	Control (n=50)		Autistic (n=50)	
	No	%	No	%
Serum lactate	0	0%	0	0%
Serum CK	47	94%	16	32%

Discussion:

The present study was undertaken to observe some biochemical variables in male children with autistic spectrum disorders in order to evaluate their mitochondrial dysfunction. Mitochondrial dysfunction was assessed by estimating serum lactate and creatine kinase (CK) level in male children with autistic spectrum disorders. Both the variables were also studied in apparently healthy age and BMI matched male children for comparison. In this study, mean values of both the biochemical variables of control children were within physiological limit and were almost similar to those reported by different investigators.[1,5,17-23, 27]

It has been seen that defects in mitochondrial function cause critical deficiencies of energy metabolism. As autism is regarded as a general metabolic disorder so mitochondrial dysfunction may play an important role in pathogenesis of autism.[5]

It has been suggested that TCA cycle abnormality in mitochondrial dysfunction stops aerobic respiration which initiates anaerobic respiration causing increased level of lactate rise of serum lactate level .[17] Mitochondrial dysfunction also causes loss of some cellular integrity of muscle brain and liver and serum creatine kinase rises.[24]

In this study, serum lactate level was significantly higher in the study group than those of control group and this finding was supported several rechercher.[1,5,6,18,23,28]

In this present study, serum CK level was significantly higher in the study group compared to control group which was similar to several investigators' studies of different countries.[18,19,21,24]

In this present study, increased serum lactate level was found in 94% of study group, whereas serum lactate level was found within normal range in the entire control group which was consistent with other investigators. [1,5,18,24,25,27]

In addition, serum CK level was found higher in 32% of study group, whereas serum CK level was found

within normal range in the entire control group and it was supported by other studies. [18,19,21,24]

Conclusion:

From the result of this study, it may be concluded that mitochondrial dysfunction may occur in children with autistic spectrum disorder may occur in children with autistic spectrum disorder.

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Original Article

KNOWLEDGE, ATTITUDES, AND PRACTICES RELATED TO HYPERTENSION AMONG ADULT PEOPLE IN SELECTED AREAS OF UTTARA, DHAKA, BANGLADESH

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Received: 27 January 2025
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Abstract:

Background: *Hypertension often called a "silent killer", is a leading cause of cardiovascular diseases globally. This study focuses on the knowledge, attitude and practices (KAP) related to hypertension among adults in Uttara, Dhaka. Understanding the KAP of hypertension is essential to developing effective health interventions and promoting preventive measures to reduce hypertension-related morbidity and mortality in this area.*

Methods: *This descriptive cross-sectional study was conducted among 170 respondents selected by using simple random sampling method from areas of Dhaka North City and Dhaka South City Corporation. Relevant data were collected through face-to-face interview with the help of semi-structured questionnaire.*

Results: *Among the total 170 respondents from different locations in Uttara, Dhaka, with 31.8% being male and 68.2% female. Regarding association between socio-demographic characteristics and various KAP aspects related to hypertension. Age (18-35 years) and education (Bachelor's) were significantly associated with better knowledge, positive attitudes, and healthier practices regarding hypertension. Profession (service holders) and income (10000-20000 BDT) were also significantly linked to knowledge and practices. Regarding knowledge among the respondents while 78% of participants had good knowledge of hypertension and 93% display positive attitudes towards its prevention, only 38% engage in effective practices for prevention of condition.*

Conclusion: *This study offers valuable insights into the knowledge, attitudes, and practices (KAP) regarding hypertension among adult people in Uttara, Dhaka. Although attitudes toward hypertension prevention were generally positive, the findings suggest that individuals lack sufficient guidance and motivation to implement and sustain health behaviours about hypertension prevention and control.*

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Keywords:
Hypertension, knowledge, attitudes, practices, adult population.

Introduction:

Hypertension, a leading global health issue often referred to as a silent killer, poses serious public health risks, particularly in low- and middle-income countries. The World Health Organization identifies hypertension as a major risk factor for cardiovascular diseases, including heart disease and stroke, which are significant contributors to global morbidity and mortality (WHO, 2023). In Bangladesh, rapid urbanization and demographic transitions have escalated the prevalence of hypertension, posing challenges for the healthcare system (Islam, Mohiuddin, & Chowdhury, 2015). Research indicates a considerable gap in awareness about hypertension's

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risk factors, symptoms, and management practices among Bangladeshi adults, with misperceptions about causes and treatment affecting healthcare behaviours. Effective control of hypertension can significantly advance the Sustainable Development Goal focused on non-communicable diseases by reducing preventable deaths and improving health outcomes (Hossain, Suhel, & Rahman, 2022).While these insights underscore the importance of hypertension education, further study is needed to examine specific levels of knowledge, attitudes, and practices (KAP) regarding hypertension among adults in urban areas like Uttara, Dhaka. The number of people living with hypertension (blood pressure of ≥140 mmHg systolic or ≥90 mmHg diastolic or on medication) doubled between 1990 and 2019, from .65 billion to 1.3 billion (NCD Risk Factor Collaboration; NCD-RisC, 2021). This common, deadly health condition is a significant public health challenge that leads to stroke, heart attack, heart failure, kidney damage and many other health problems (Forouzanfar et al., 2017). A recent empirical study of 87 behavioural, environmental, occupational and metabolic risk factors revealed that high systolic blood pressure (e”110–115 mmHg) was the single most significant risk factor for early death worldwide, leading to an estimated 10.8 million avoidable deaths every year, and a burden of 235 million years of life lost or lived with a disability (disability-adjusted life years, DALYs) annually (GBD 2019 Risk Factors Collaborators, 2020).

This study, therefore, aims to assess the levels of knowledge, attitudes, and practices regarding hypertension among adults in Uttara, Dhaka. By focusing on this urban population, the research seeks to provide evidence-based insights for designing tailored public health interventions to improve hypertension prevention, awareness, and management of the treatment.

Methods:

This descriptive cross-sectional study was conducted the target population were the people residing within areas from sector no. 1 to sector no. 18 of Uttara Model Town, Dhaka, Bangladesh. The study was conducted over a period of 1 year from October 2023 to September 2024. Participants were selected using a simple random sampling method where each member of the subset has an equal probability of being chosen. Bangladeshi adult aged 18 years and above who resides in Uttara, Dhaka, were the study population. A total of 170 respondents were interviewed. A face-to-face structured interview was administered in the local Bengali language to all participants. The interview, administered in 25 to 30 minutes, using 18-itemed pre-validated semi-structured questionnaire of KAP on hypertension and sociodemographic variables. Comparison has been made between different socio-demographic characteristics and KAP on hypertension. The chi-square test and logistic regression were done as appropriate to see the statistical significance. Data gathered from the tools regarding KAP on hypertension will be descriptively analysed by the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) software version ‘IBM SPSS Statistics 16’ in terms of frequencies, percentages and analyse. Information is presented in the form of graphs and charts mainly.

Results:

In Table-II shows that the majority of respondents demonstrated good knowledge of hypertension, with 78% knowing the normal blood pressure reading, 92.72% recognizing excessive salt intake as a risk factor, and 83.5% understanding that being overweight contributes to hypertension. Knowledge was generally higher among females than males across all categories.

In Table III reveals that a large proportion of respondents displayed positive attitudes towards hypertension prevention, with 93.52% considering regular blood pressure checking important, and 98.27% believing that regular exercise is beneficial for well-being. Male respondents demonstrated slightly lower positive attitudes compared to females in both categories.

In Table-IV discloses that hypertension among respondents was relatively low, with 74.70% avoiding fatty foods regularly, but only 31.18% frequently checking their body weight, and 37.65% engaging in regular physical exercise. Additionally, 15.3% of hypertensive respondents reported missing their hypertensive medication, and females showed better adherence to all practices compared to males.

In table V shows the association between socio-demographic characteristics and various KAP aspects related to hypertension. Age (18-35 years) and education (Bachelor’s) were significantly associated with better knowledge, positive attitudes, and healthier practices regarding hypertension. Profession (service

Table-I

Socio-demographic Characteristics of the respondents (n=170)

Socio-demographic Characteristics		Frequency	Percentage	Statistics	
Age Group (Year)	18-35	107	62.9	Mean	34.69 Years
	36-50	50	29.4	Median	32.00 Years
	51-65	11	6.5	Mode	28.00 Years
	>65	2	1.2	Std. Deviation	±10.10 Years
	Total	170	100%	Minimum	18 Years
				Maximum	67 Years
Sex	Male	54	31.8%		
	Female	116	68.2%		
Education	PSC	20	11.8%		
	SSC	22	12.9%		
	HSC	47	27.6%		
	Bachelor	67	39.4%		
	Postgrad	14	8.3%		
Profession	Service Holder	112	65.9%		
	Businessman	7	4.1%		
	Retired	5	2.9%		
	Others	46	27.1%		
Marital status	Married	139	81.8%		
	Unmarried	30	17.6%		
	Divorced	1	0.6%		
Monthly income	10000-20000BDT	39	22.9%		
	21000-40000BDT	47	27.6%		
	41000-60000BDT	12	7.2%		
	>61000 BDT	5	2.9%		
	NO/Not disclose	67	39.4%		

Table-II

Distribution of respondents regarding knowledge of hypertension.

Category	Response	Frequency	Percent	Male	Female
Do you know the normal blood	Yes	131	78.0%	26%	52%
pressure reading?	No	39	22.0%	5.88%	16.12%
Is excessive salt intake one of the	Yes	158	92.72%	30.58%	62.14%
risk factors for developing hypertension?	No	12	7.28%	1.40%	5.88%
Do you know overweight is one of the risk	Yes	142	83.5%	29.5%	54%
factors for developing high BP?	No	28	16.5%	2.35%	14.15%

Table-III

Distribution of respondents regarding attitudes of hypertension

Category	Response	Frequency	Percent	Male	Female
Do you think regular	Yes	159	93.52%	31.17%	62.35%
checking of BP is important?	No	11	6.48%	0.60%	5.88%
Should we exercise regularly	Yes	167	98.27%	31.80%	66.47%
for a healthy life?	No	3	1.8%	0.00%	1.8%

Table-IV

Distribution of respondents regarding the practices of hypertension

Category	Response	Frequency	Percent	Male	Female
Do you avoid fatty food	Yes	127	74.70%	24.70%	50%
consumption frequently?	No	43	25.3%	7.1%	18.2%
Do you check your body	Yes	53	31.18%	11.18%	20%
weight regularly?	No	117	68.82%	20.58%	48.24%
Do you perform physical	Yes	64	37.65%	12.94%	24.71%
exercise regularly?	No	106	62.35%	18.82%	43.53%
Do you miss your	Yes	26	15.3%	1.77%	13.53%
hypertensive medication?	No	17	10.0%	3.53%	6.47%

Table-V

Association Between Socio-demographic characteristics and KAP of hypertension

Variables	KAP Aspect	Chi-Square (χ^2)	p-value
Age (18-35 years)	Knowledge of Normal Hypertension Readings	17.957	0.000
Gender	Knowledge of Normal Hypertension Readings	0.876	0.349
Education (Bachelor's)	Knowledge of Normal Hypertension Readings	30.221	0.000
Profession (Service Holder)	Knowledge of Normal Hypertension Readings	29.472	0.000
Income (10000-20000 BDT)	Knowledge of Normal Hypertension Readings	15.533	0.004
Age (18-35 years)	Attitudes Towards Hypertension Prevention	21.372	0.001
Gender	Attitudes Towards Hypertension Prevention	3.154	0.076
Education (Bachelor's)	Attitudes Towards Hypertension Prevention	25.672	0.000
Profession (Service)	Attitudes Towards Hypertension Prevention	18.987	0.002
Income (10000-20000 BDT)	Attitudes Towards Hypertension Prevention	11.546	0.019
Age (18-35 years)	Practices for Hypertension Prevention	16.898	0.005
Gender	Practices for Hypertension Prevention	1.247	0.264
Education (Bachelor's)	Practices for Hypertension Prevention	28.113	0.000
Profession (Service)	Practices for Hypertension Prevention	22.681	0.001
Income (10000-20000 BDT)	Practices for Hypertension Prevention	14.029	0.007

holders) and income (10000-20000 BDT) were also significantly linked to knowledge and practices, indicating that individuals in these groups tend to engage more in hypertension Prevention. However, gender (male) showed no significant association across any KAP aspects, suggesting no notable differences in hypertension-related knowledge, attitudes, or practices based on gender.

In Figure 1 shows the gender distribution of the respondents. Among the 170 respondents, 116 (68%) were female and the rest 54 (32%) were male.

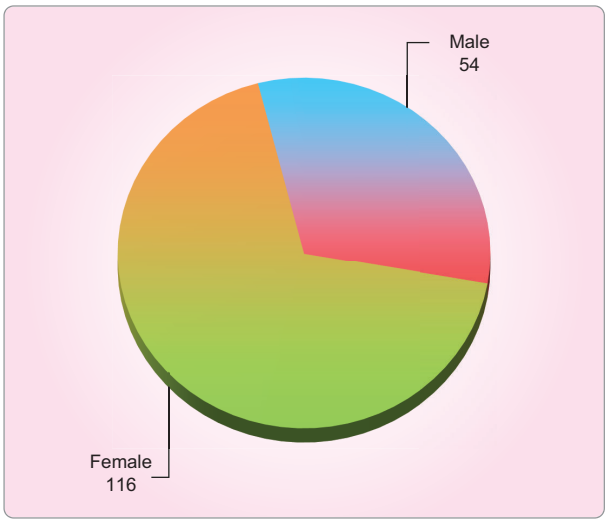

Figure 1: *Distribution of the respondents by gender (n= 170)*

In Figure 2 shows that while 78% of participants had good knowledge of hypertension and 93% display

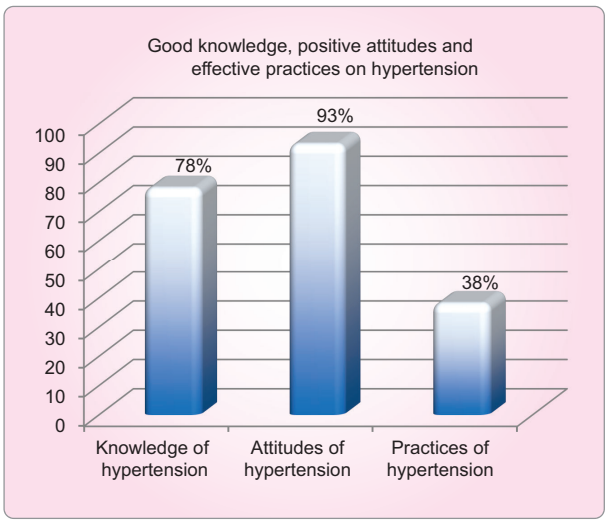

Figure 2: *Proportion of respondents with Good Knowledge, Positive Attitudes, and Effective Practices on Hypertension."*

positive attitudes towards its prevention, only 38% engage in effective practices for prevention of condition. This indicates a significant gap between awareness and actual behaviour, suggesting the need for interventions to promote better hypertension prevention practices.

Discussion:

This cross-sectional study examined the Knowledge, Attitudes, and Practices (KAP) related to hypertension among 170 adult respondents in Uttara, Dhaka. The findings demonstrate that socio-demographic characteristics such as age, education, profession, and income were significantly influenced hypertension-related KAP, similar to findings in other countries like Bangladesh and China. Respondents aged 18-35 years accounted for 62.9% of the sample, with this younger group showing superior knowledge of normal hypertension readings, where 78% of them could identify normal blood pressure. This aligns with a study (Rahman et al. 2018), where 62.5% of younger respondents aged 20-40 demonstrated high awareness of hypertension and actively sought preventive actions. In China another study similarly reported that 64.7% of respondents aged 18-39 years had better knowledge of hypertension, showing that younger adults tend to be more informed and likely to engage in preventive measures, driven by greater access to health information about hypertension (Gong et al. 2020).Respondents with a Bachelor's degree or higher represented 39.4% of the sample and consistently displayed better knowledge and healthier practices in prevention of hypertension. This is in line with (Rahman et al. 2018), who found that 45% of respondents with higher education in Bangladesh were more knowledgeable and proactive in managing their blood pressure. Similarly, (Gong et al. 2020) observed that in China, individuals with higher education were 70.1% more likely to adopt lifestyle changes and follow medical advice to manage hypertension, reinforcing the critical role education plays in chronic disease management. Occupation also played a significant role in hypertension KAP. In this study, 65.9% of respondents were service holders, and this group showed better knowledge and engagement in practices such as regular blood pressure monitoring. This mirrors findings from (Rahman et al. 2018), where service holders had higher rates of hypertension awareness and management, attributed to their access to healthcare resources and workplace wellness programs. Income

also had a notable impact, with 27.6% of respondents earning between 21,000-40,000 BDT showing higher knowledge and better practices for hypertension management. This supports the findings of (Rahman et al. (2018), where income was closely tied to health behaviours, with higher-income respondents showing better adherence to treatment and lifestyle changes. (Gong et al. 2020) reported that 68.5% of higher-income respondents in China were more consistent in following prescribed medical routines and making dietary adjustments. In both countries, income is a strong indicator of access to healthcare services and the ability to manage chronic conditions like hypertension. However, no significant gender differences were observed in hypertension-related KAP in this study, with both males (31.8%) and females (68.2%) displaying similar levels of knowledge and attitudes. This finding is consistent with (Gong et al. 2020), where gender did not significantly influence hypertension-related outcomes, suggesting that health behaviours related to hypertension are evenly distributed between men and women in these populations. Despite positive attitudes toward hypertension prevention, 93.5% of respondents considered regular blood pressure checks important but actual practices were lacking. Only 37.65% engaged in regular physical exercise, and just 31.18% monitored their body weight regularly. These results are consistent with (Gong et al. 2020), where respondents had high awareness of hypertension risks but only 40.2% engaged in regular physical activity. Similarly, (Rahman et al. 2018) reported that only 38.5% of respondents actively exercised, highlighting the gap between awareness and action.

Conclusion:

This study offers valuable insights into the knowledge, attitudes, and practices (KAP) regarding hypertension among adult people in Uttara, Dhaka. While many participants demonstrated basic awareness of hypertension, there were notable gaps in comprehensive understanding, particularly about risk factors and long-term complications. Public health strategies should focus on enhancing health education, improving healthcare accessibility, and developing community-based programs to prevent hypertension.

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Original Article

EARLY GALLBLADDER CARCINOMA: DEMOGRAPHIC CHARACTERISTICS, ASSOCIATED FACTORS AND OUTCOME AFTER SURGERY OF 40 CASES, MANAGED IN BIRDEM AND OTHER TERTIARY CARE CENTERS OF BANGLADESH

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Abstract:

Background: *Gall bladder carcinoma is the most prevalent biliary tract malignancy worldwide. It has has no specific symptoms. Symptoms begin with the advancement of disease and it terminate the life quickly. Thus, early diagnosis and treatment brings good outcome after surgery.*

Method: *This was a cross sectional descriptive study was conducted in admitted patients, in the Department of Hepato-Biliary-Pancreatic surgery and Liver Transplant (HBPS &LT$_{X)}$ in BIRDEM General Hospital , Ibn Sina Specialized hospital and Crescent Gastro Liver and General hospital in Dhaka , over a period of 2 and 1/2 years , from January 2022 to June 2024. 90% data obtained from BIRDEM and 10% from above mentioned hospitals. An estimate sample size was 86. But due to limitation of time ,a total 40 cases had been taken, after considering the inclusion and exclusion criteria . All histopathologically proven early gallbladder carcinoma were included while carcinoma with features of advance malignancy were excluded. Cases were selected irrespective of age and sex , anatomical distribution, clinical presentation, risk factors, histological type and outcome after surgery. Having obtained ethical clearance from the Ethical committee and verbal consent from the the patients, data were collected from the patients, through face to face interview by using a questionnaire devised for the study by researcher himself.*

Result: *A total 40 cases were included in the study. The peak incidence of gallbladder carcinoma was observed in 5th and 6th decades of life with the mean age of the cases being 58.12±7.75 (range: 35-80) years . Male to female predominance was 1:2.34. Gall stone (80%) was the most common associated factor and mostly diagnosed incidentally (92.5%). Mostly done procedure was laparoscopic cholecystectomy and it was about 90% .Tumor involve fundus of the gallbladder in 55% cases and most of these were adenocarcinoma (90%). After surgery wound infection rate 7.5%, port site hernia 5%, there was no recurrence and survivability was 97.5% within this 2$^{1/2}$ years of study periods.*

Conclusion: Early surgical intervention brings good result in the management of early gallbladder carcinoma.

Keywords:
Early gallbladder carcinoma; Risk factors; Treatment outcome.

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Introduction:

Early gallbladder carcinoma (EGBC) is defined as cancer confined to the mucosa (pT1a) or muscularis (pT1b) according to the TNM classification. The incidence of gallbladder carcinoma in Bangladesh is 5.3%[1,2]. Clinical symptoms of EGBC can be non-specific and symptoms begin with the advancement of the diseases with a very gloomy outcome .It is unlikely many other malignancy of the body , this tumour does not respond well to the conventional chemo-radiotherapy and surgery is the only treatment option in early cases..

Methods: This cross-sectional descriptive study was carried out in the Department of Hepato-Biliary-Pancreatic surgery and Liver Transplant (HBPS & $LT_{x)}$ in Bangladesh Institute of Diabetes, Endocrine and Metabolic Disorders (BIRDEM) Hospital , Ibn Sina Specialized hospital and Crescent Gastro Liver and General hospital, from January 2022 to June 2024. Data were collected by using a questionnaire devised for the study by researcher himself. 90% data were obtained from BIRDEM and 10% from above mentioned hospital. Data processing and analysis were done using SPSS (statistical package for social sciences), version 26. The test statistics used to analyze the data were descriptive statistics

Result: Total patients were 40 with female predominance (male 12, female 28). Mean age of the patients was 58.12 ±?7.75 years with majority (70%) being in 56-65 years group. The youngest and the oldest ages were 35 and 80 years respectively (Table I).

Among the associated disease ,cholelithiasis (90%) was the most common , other associated factors were obesity and gall bladder polyp 2 (5%) cases each ;choledochal cyst with anomalous pancreatico-biliary maljunctionand and positive family history 1 (2.5%) case each (Table II).

EGBC mostly diagnosed incidentally (92.5%). Preoperative suspicious was possible only in 7.5% cases(Table III)

Table-I

Distribution of the patients by their demographic characteristics (n=40)

Sex	No of cases	Frequency in age group(Years)					Mean age	Standard
	(n-40)	35-45	46-55	56-65	66-75	>76	(Years)	deviation
Male	12 (30%)	o	o	10 (25%)	1 (2.5%)	1(2.5%)	58.12	7.75
Female	28 (70%)	1 (2.5%)	3 (7.5%)	18 (45%)	5(12.5%)	1(2.5%)		

Table-II

Associated factors for of gall bladder carcinoma

Factors	Frequency	Percentage (%)
Gall stone	36	90
Silent /asymptomatic+symptomatic	29+7	80.6+19.4
Obesity	2	5
Gall bladder polyp	2	5
Choledochal cyst with anomalous pancreatico-biliary maljunction	1	2.5
Family history	1	2.5

Table-III

Time of diagnosis of gall bladder carcinoma in relation with operation

Time of diagnosis	No of cases	Percentage
Pre- operative diagnosis (Suspicision on imaging)	3	7.5
Gall bladder polyp(size >2cm)	2	5
Cholecystitis(irregular wall thickening)	1	2.5
Post-operative diagnosis (Specimen showed malignancy)	37	92.5
Cholelithiasis with cholecystitis	36	90
Choledochal cyst with Pancreatico-biliary maljunction	1	2.5

Four type of surgical intervention was done and laparoscopic cholecystectomy (90%) was the most common surgical intervention and others were open procedure. Among the open procedure 2 (5%) cases underwent laparoscopic cholecystectomy followed by frozen section biopsy, 1 (2.5%) case underwent limited hepatic bisegmentectomy (frozen section facility not available) and 1 (2.5%) case underwent cholecystectomy and total excision of choledochal cyst with with Roux –en –Y hepatico-jejunostomy (Table IV).

Figure 1 illustrates the site of origin of tumour in gall bladder. 22(55%) cases carcinoma originate from the fundus,12(30%) cases from body, and 6(15%) cases from neck.

Most common histological variant was adeno-carcinoma and it was about 36 (90%) cases , others were mucinous adenocarcinoma 2 (5%) cases ; papillary adenocarcinoma and adeno-squamous cell carcinoma 1 (2.5%) case each (Table V).

CA19-9 (cut off value 37 U/mL) and CEA(cut off value 10 ng/mL) were done before surgery in 7 cases and 4 cases respectively and after surgery these level were done in every cases and these level were below normal in every cases (Table VI).

Subsequent follow up and radiology showed no further evidence of recurrence. 3 (7.5%) patients had experienced wound infection , 2 (5%) patients had port site hernia and survivability was 97.5% within 2.5 years of the study period(Table VII).

Table-IV

Types of procedure performed prior to diagnosis of gall bladder carcinoma

Types of procedure	Number of cases	Percentage
Laparoscopic procedure(lap.cholecystectomy)	36	90
Open procedure	4	10
Frozen section biopsy	2	5
Hepatic bisegmentectomy (frozen section facility not available)	1	2.5
Cholecystectomy with total excision of choledochal cyst with Roux-en-Y hepatico-jejunostomy	1	2.5

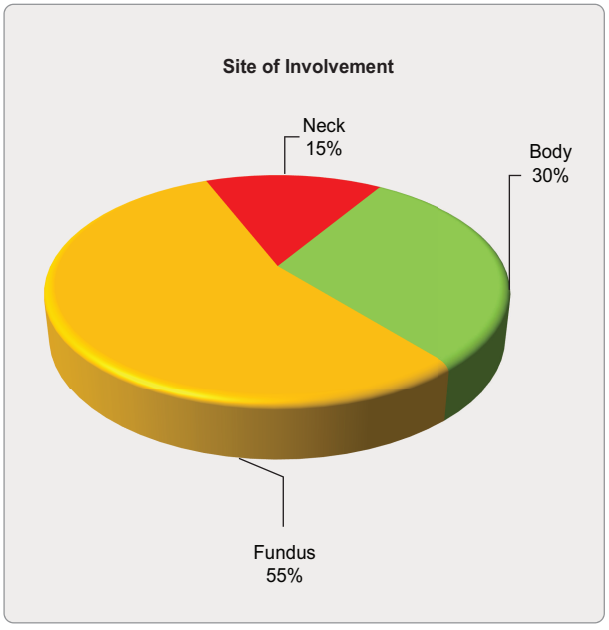

Figure 1: *Involving site of carcinoma in the gallbladder*

Table-V

Histopathological variant of gall bladder carcinoma.

Histological type	No of cases	Percentage(%)
Adenocarcinoma	36	90
Mucinous adenocarcinoma	2	5
Papillary adenocarcinoma	1	2.5
Adeno squamous cell carcinoma	1	2.5

Table-VI

Relation of tumor markers CA19-9 and CEA. With gallbladder carcinoma

		CA 19-9	
	No of cases	Level>37 U/mL	Level<37 U/mL
Pre-operative	7	2	5
Pre-operative	39	O	39
		CEA	
	No of cases	Level>10 ng/mL	Level<10 ng/mL
Pre-operative	3	1	2
Post-operative	39	0	39

Table-VII
Outcome of 40 cases of early gallbladder carcinoma managed surgically.

Surgical out comes	frequency	Percentage (%)
Wound infection	3	7.5
Open procedure	2	5
Laparoscopic cholecystectomy	1	2.5
Hernia (port site)	2	5
Recurrence	0	0
Survivability	39	97.5

Discussion:

In the current study, the mean age at diagnosis was 58.12±7.75 years and female were diagnosed more and male-to- female ratio was 1:2.34. In a Indian study, conducted by Dutta U, Bush N, Kalsi D, Popli P, Kapoor VK et al. showed that the mean age of presentation of GBC in Indian subcontinent is younger than their counterparts in the USA and western European countries.[2,3] In their study , they also mentioned that women of this region are exposed to higher levels of estrogen and progesterone during their lifetime which promotes benign and malignant diseases of gallbladder.[2,3] In this study , gall stone (90%) was the most common associated factors others were obesity (5%), gall bladder polyp (5%) ,anomalous pancreatico biliary mal junction (2.5%) and positive hamily history of gall bladder carcinoma (2.5%). A study conducted in Germany, in 2019 , by Søreide K, Guest RV, Harrison EM, Kendall TJ, Garden OJ, Wigmore SJ et al. showed that 70 to 90% of GBC patients have cholelithiasis and it is presumed that chronic mucosal irritation by calculi leads to dysplasia and eventually develop carcinoma.[3] The Cancer Prevention Study II Nutrition Cohort, the relative risk of gallbladder cancer was 1.8 (95%confidence interval [CI], 1.1 to 2.9) in obese men with a BMI of 30.0 to 34.9 compared to men with a normal BMI (18.5 to24.9).[3] Alvi AR et al. showed in his study that several factors are signs of potential malignant growth of polyp: polyps greater than 10 mm, rapidly increasing polyps, solitary or sessile polyps, association with gallstones, patients over 50 years of age.[4] In his study he also evaluated the risk of anomalous pancreaticobiliary maljunction with carcinoma of gallbladder and describe the pathological changes in anomalous junction.[5] Anomalous pancreaticobiliary maljunction potentially allowing pancreatic secretions to regurgitate into the biliary system and gallbladder, and so leading to malignant changes in the mucosa.[5] The histological subtype in such cases is usually a papillary carcinoma.[9] Our study was correspond to this international study.[4,5] In current study , most of the cases (92.5%) were diagnosed incidentally and suspicious cases underwent open procedure.

A similar finding was reported by some other researchers in patient with GBC. [8] According to Blumgart's Surgery of the Liver, Biliary Tract and Pancreases, authors advocate when a EBGC suspected preoperatively, it is contraindicated to do a laparoscopic cholecystectomy to prevent perforation of the gallbladder wall and the spillage of bile into the abdominal cavity (15-45% of patients) which tends to result in dissemination and significantly worsens the prognosis.[16,17] In this current study, most (55%) carcinoma originate from the fundus and most common histological variant was adenocarcinoma (90%) which are similar to other international study.[9,12] In current study, CA 19-9 and CEA were used to assess the residual diseases and recurrence after surgery. Ashish Sachan, Sundeep Singh Saluja, Phani Kumar Nekarakanti et al. conducted a study in Department of Gastrointestinal Surgery, Govind Ballabh Pant Institute of Post Graduate Medical Education and Research, Jawahar Lal Nehru Marg, New Delhi, 2020, India to evaluate the role of tumor markers-carbohydrate antigen 19–9 (CA19–9) and carcinoma embryonic antigen (CEA) in patients with GBC. They included 176 patients in their study and advocate that higher levels of CA 19-9 and CEA , may not mean that anyone have carcinoma, conditions other than cancer can cause higher level .These conditions include an infection or inflammation in pancreases, liver disease, gall stone and cystic fibrosis[14]. In this study wound infection rate in laparoscopic procedure was 2.5% and in open procedure 5%. Agaba EA, Rainville H, Wemulapali P et al reported in their study that the incidence of SSI rates ranged from 2.5% to 41.9%[18] In this study, port site hernia was 5% (2 cases). We didn't observe any hernia in open procedure. Hernias at the port insertion site have been reported in many papers with the incidence between 0.14% and 22[18]. Study period was 18 months and there was no recurrence observed during this period. Patients were assessed clinically and biochemically including liver function test and tumor marker and USG of whole abdomen at 3 months interval during first 3 months and 6 months interval in later years.

Recurrence depends on tumor size, tumor morphology resection margin, hepatic versus peritoneal side involvement and portal vein involvement.[20] According to Blumgart's Surgery of the Liver, Biliary Tract and Pancreases ,authors report that in case of t1a tumour ,simple cholecystectomy is appropriate and curative in 90% cases and 1 year OS of 100% for patient with T1a tumours[16,17].In current study, out of 40 cases, 1 patient died due to sudden myocardial infraction on 4th post-operative day, following laparoscopic cholecystectomy and this patient was already discharged from hospital. In this study 1 year survivability was 97.5%.The study period was short to follow up the survivability of early gall bladder carcinoma. In this study another observation was, follow up period was short to be significant .According to international study, there is a cumulative survival rate by stage. T1a stage cancers (infiltration limited to the mucosa) require only a cholecystectomy, provided that the margin of the cystic duct is free from cancer[18]. The prognosis for this group of patients is very good and according to some reports a 5-year survival reaches 100% [18,19] Prognosis depends mainly on the stage of the disease and the possibility of R0 resection.[20] The tumor biology seems to play a key role and it largely determines the course of the disease.[20] The least advanced cancers (T1a) allow for almost a 100% 5-year survival after only laparoscopic cholecystectomy.[21] Therefore, patients with incidentally detected cancer have significantly better prognosis',[21] In this study most of the cases were incidentally diagnosed and their prognosis were good.

Having summarized the above mentione discussion , it is evident that early–stage gallbladder carcinoma is most commonly an incidental finding in patients who have undergone cholecystectomy for inflammatory disease of the gallbladder. However. if detected early in young patient with early stage (t1a tumor), has better overall 5 years survival rates.

Conflict of interest: Nothing to declare.

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Original Article

PALMAR DERMATOGLYPHICS OF AUTISTIC AND HEALTHY CHILDREN IN RAJSHAHI DISTRICT OF BANGLADESH : A COMPARATIVE STUDY

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Abstract:

Background: *Dermatoglyphics is the scientific study of the typical ridges found on human fingers, palm of the hands, toes and soles of the feet. There may be variation of fingerprints between autistic and healthy children.*

Objective: *The purpose of the study was to assess and compare the fingerprint patterns between autistic and healthy children.*

Methodology: *It was a cross sectional type of comparative study conducted under the guidance of Anatomy department of Rajshahi Medical College for a period of 1 year from January 2023 to December 2023. This study was performed on 220 children between the age of 05-15 years group, among them 110 were autistic and 110 healthy children.. Fingerprints were taken by ink and pad method of Cummins..*

Result: *Distribution of fingerprint pattern in right hand of the autistic children showed that loop pattern was 63.6%, whorl was 24.9% and arch was 11.1% and in case of healthy loop was 74% whorl was 19.1% and arch was 6.7%. Fingerprint pattern of left hand of autistic children revealed that the loop was 66.4%, whorl was 22.4% and arch was 10.7% and in healthy children loop was 70.4%, whorl was 21.4% and arch was 7.8 %. The pattern differences between autistic and healthy children were highly significant ($p < 0.001$) .The mean ATD angle was 39.23° ± 2.5 in autistic children and was 43.23° ± 4.5° in healthy. The ATD angle was significantly increased in healthy children ($p < 0.001$ for each group).*

Conclusion: *The present study stated that the fingerprint pattern of autistic children was different from the healthy children. So, it might be helpful for the diagnosis of neurodevelopmental diseases.*

Key Word:
Dermatoglyphics, Loop,Whorl, Arch, ATD angle.

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Introduction:

Dermatoglyphics is the branch of Medical Science that deals with the study of epidermal ridges of skin found on the tip of the fingers, palm of the hand, tip of the toes and sole of the foot. Epidermal ridges are formed at 10th weeks of gestation and at 24th weeks they remain unchanged.[1] Dermatoglyphics is unique for each person, which may be determined by a number of parameters that could help in diagnosis and treatment of individual.[2] It is one of the most widely used method for personal identification.[3] It is a non-invasive method. In modern world the importance of fingerprint is not only restricted in the field of forensic and criminal applications but also important for

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anthropological and racial identification. Measurable parameter includes the frequency of ridges of particular pattern and disposition of triradius junctional areas where three sets of parallel ridges meet. Francis Galton (1892) classified fingerprint patterns into three major types: loop, whorl and arch. Loop is such a pattern in which one or more ridges enter from either side, re-curve, touch or pass an imaginary line between delta and core that cross upon the same side as the ridges entered.[4] Whorl is globalized by a typical concentric design. The majority of ridges incline to make a consummate circuit around the core, a pivotal feature in the interior of the pattern. The arches are described as pattern in which ridges enter from one side, elevate or curve at the center and flow out from the antithesis side.[5] Loops are about 60-70%, whorls are about 25-35% and arches are about 6-7% in distribution. Axial Triradius angle or ATD angle is a dermatoglyphics trait which is widely used in dermatoglyphics studies The angle is formed by drawing lines between the triradii below the index and little digit, most proximal triradius on the hypothenar region of palm.

Depending upon the proximity to the lower margin of the palm, it is designated as t, t‘ and t“.[6] The value of the angle < 45º corresponds to t, value of intermediate to 45º - 56º is t‘ and > 56º is t“.[7] Fingerprints are characterized by altering strips of raised friction ridges and the grooves that form specific pattern. So they remain intact throughout the life from infancy to old age. The properties of fingerprints are never duplicated. They are distinctive and unique for each individual.[7] Even identical twins do not have identical fingerprints though their identical genes given them very similar patterns.[9] Dermatoglyphics is correlated with genetical abnormalities. It is useful in diagnosis of congenital malformations and mental retardation such as Autism, Down syndrome, Schizophrenia etc. Specific dermatoglyphics in patients with autism and mental retardation can be used as screening tools for diagnosis.[10] The involvement of nervous system is correlated with the development of epidermal ridge pattern. Disorders of neural development such as autism which is marked by defective synaptic function and aberrant neural connectivity.[11] Formation of dermatoglyphics pattern is associated with testosterone during pregnancy, while testosterone also affected the development of nerve in the brain.[11]

The incidence and prevalence rates are roughly equal worldwide which is about 1% .[12] Autism is a condition involving a severe neurodevelopmental disorder and is characterized by impairment in social interaction and communication, as well as restricted and repetitive behavior.[3] Autism is usually classified under a large family called Autism Spectrum Disorder (ASD) or Pervasive Developmental Disorder (PDD). Autism Spectrum Disorder (ASD) are complex clinical condition of brain that express at around two with a core set of symptoms which is relating to people in unusual ways, delayed language development as well as repetitive or stereotyped behaviors.[13] Autism and fingerprints are associated with biological and clinical values as the ridges and brain have a common epidermal origin during 10th - 24th weeks of gestation.[14] Presence of specific dermatoglyphics pattern is an accompanying feature in various groups of diseases such as chromosomal aberrations, sickle cell disease, psoriasis, cancer, congenital heart disease and mental retardation.[15] But there are some exceptional condition in which there is absence of fingerprints termed as Adermatoglyphia (Gray’s 2021). In cases of leprosy, patients being treated with anticancer drugs, ectodermal dysplasia, repeated x-ray, acerbic agents, grievous injuries may cause harm to the fingerprints.[16] A very few number of study has been done about Palmar dermatoglyphics in autism in different countries. For this reason, this study would conducted. This study might provide information about the dermatoglyphics of autistic children in Rajshahi district of Bangladesh .

Materials and Methods

This was a cross-sectional type of comparative study, conducted in the Department of Anatomy, Rajshahi Medical College, Rajshahi. Data were collected from the Autistic Institutes for the autistic children and Primary and High school for healthy children over the period of January 2023 to December 2023. Total 220 children of 05-15 years age would be included in this study (110 autistic and 110 healthy children) their palm and fingers of both hands was placed on white paper and impressions were taken by ink pad Method of Cummins. The fingerprint pattern was observed and screened with magnifying glass to reveal the pattern of finger ridge. Their ATD angle was made by joining two lines from the triradii below the index and little digits. Data were expressed as frequency and corresponding percentage, quantitative data were presented as mean/median and standard deviation (SD).

Chi-square test was done for quantitative comparison. The statistical significance was evaluated as appropriate probability level and $p < 0.05$ was considered statistically significant for all tests by using SPSS (Statistical Package for Social Sciences), version 25.0. The statistical significance was evaluated as appropriate probability level and $p < 0.05$ was considered statistically significant for all test

Results :

Table-I

Distribution of Autistic and Healthy children by age (n =110 in each group)

Age	Frequency	%	Frequency	%
05-10 y	57	51.8	65	59.1
11-15	53	48.2	45	40.9
Total	110	100	110	100

A total 220 children were enrolled in this study. The mean age was 7.4± 2.5 SD years (range = 05- 15 years) in Autistic children and 13.6 ± 2.4 SD years in Healthy children.

Table-II

Distribution of children by sex (n =110 in each group)

Sex	Autistic children		Healthy children	
distribution	Frequency	%	Frequency	%
Male	58	52.7	54	49.1
Female	52	47.3	56	50.9
Total	110	100	110	100

Accordingly, the sex distribution, 58 (52.7%) were autistic male and 52 (47.3%) were autistic female. On the other hand 54 (49.1%) were healthy male and 56 (50.9%) were healthy female.

Table-III

Distribution of fingerprint pattern of right hand in Autistic and Health children

Fingerprint pattern	Autistic children n = (110 × 5) = 550		Healthy children n = (110 × 5) = 550	
	Frequency	%	Frequency	%
Loop	350	63.6	407	74
Whorl	137	24.9	105	19.1
Arch	63	11.5	38	6.9
Total	550	100	550	100

It revealed that fingerprints pattern of right hand. The loop pattern was 350 (63.60%), whorl was 137 (24.9 %), arch was 63 (11.5 %) in autistic and loop was 407 (74%), whorl was 105 (19.1 %), arch was 38 (6.9 %) in healthy children

Table-IV

Distribution of fingerprint pattern of left hand in Autistic and Healthy children

Fingerprint pattern	Autistic children n = (110 × 5) = 550		Healthy children n = (110 × 5) = 550	
	Frequency	%	Frequency	%
Loop	365	66.4	387	70.4
Whorl	123	22.4	118	21.4
Arch	62	11.2	45	8.2
Total	550	100	550	100

It revealed that fingerprints pattern of left hand : the loop pattern was 365 (66.40%), whorl was 123 (22.4 %) arch was 62 (11.2 %) in autistic and loop was 387 (70.4%), whorl was 118 (21.4 %), arch was 45 (8.2 %) in healthy children

Table-V

Comparison of ATD angle of right hand between autistic and healthy children

ATD angle	Autistic (n = 110)	Healthy (n = 110)	p-value
<45º	89 (80.9%)	72 (65.5 %)	< 0.001
45º-56º	19 (17.3%)	33 (30%)	< 0.001
>56º	02 (1.8%)	05 (4.5%)	< 0.001
Mean ATD	38.23º ± 2.5º	43.23º ± 4.5º	< 0.001

Mean angle = (34.34° ± 2.8 °) ; Range : (37Ú- 56Ú) in Autistic

Mean angle = (44.35° ± 7.5°) ; Range : (32Ú-84Ú) in healthy.

Table-VI

Comparison of ATD angle of left hand between autistic and healthy children

ATD angle	Autistic (n = 110)	Healthy (n = 110)	p-value
< 45º	86 (78.2%)	85 (65.5 %)	< 0.001
45-56º	23 (20.9%)	20 (30%)	< 0.001
Ã 56º	01 (0.9%)	05 (4.5%)	< 0.001
Mean ATD	39.23º ± 2.5º	42.23º ± 4.5º	< 0.001

Mean angle = (39.34° ± 2.8°) ; Range : (36°-55°) in Autistic

Mean angle = (43.35° ± 7.5°) ; Range : (32°-84°) in health.

Table-VII

Comparison of fingerprint pattern of right hand between autistic and healthy children :

Digit	Fingerprint pattern	Autistic (n=110)	Healthy (n=110)	p-value
1st	Loop	78 (70.9)	94 (85.5)	< 0.001
	Whorl	07 (6.4)	11(10)	< 0.001
	Arch	25 (22.7)	05 (4.5)	< 0.001
2nd	Loop	68 (61.8)	68 (61.8)	Ã 0.05
	Whorl	23.6)	30 (27.3)	< 0.001
	Arch	16(14.6)	12 (10.9)	< 0.01
3rd	Loop	71 (64.5)	83 (75.5)	< 0.001
	Whorl	27 (24.6)	18 (16.4)	< 0.001
	Arch	12 (10.9)	09 (8.1)	< 0.001
4th	Loop	42 (38.2)	69 (62.7)	< 0.001
	Whorl	65 (59.1)	33 (30)	< 0.001
	Arch	01 (0.9)	07 (6.4)	< 0.001
	Loop	91(82.7)	93 (84.6)	< 0.01
5th	Whorl	12 (10.9)	13 (11.8)	< 0.01
	Arch	07 (6.4)	04 (3.6)	< 0.001

Table-VIII

Comparison of fingerprint pattern of left hand between autistic and healthy children:

Digit	Fingerprint pattern	Autistic (n = 110)	Healthy (n =110)	p-value
1st	Loop	78 (70.9)	90 (81.8)	< 0.001
	Whorl	06 (5.5)	11 (10)	< 0.001
	Arch	26 (23.6)	09 (8.2)	< 0.001
2nd	Loop	71 (64.5)	66 (60)	< 0.001
	Whorl	25 (22.7)	29 (26.4)	< 0.001
	Arch	14 (12.7)	15 (13.6)	> 0.05
3rd	Loop	64 (58.2)	76 (69.1)	< 0.001
	Whorl	35 (31.8)	24 (21.8)	<0.001
	Arch	11 (10)	10 (9.1)	> 0.05
4th	Loop	56 (50.9)	67 (60.9)	< 0.001
	Whorl	50 (45.5)	37 (33.6)	< 0.001
	Arch	04 (3.6)	06 (5.5)	< 0.01
	Loop	96 (87.2)	88 (80)	< 0.001
5th	Whorl	07 (6.4)	17 (15.5)	< 0.001
	Arch	07 (6.4)	05 (4.5)	< 0.01

The comparison of fingerprint pattern of right hand between autistic and healthy children showed that.loop was higher in healthy than autistic and it was highly significant ($p < 0.001$) in all digits except 2nd digit.

The comparison of fingerprint pattern of left hand between autistic and healthy children showed that.loop was higher in healthy than autistic and it was highly significant ($p < 0.001$) in all digits.

Discussion:

In this study, the fingerprint of right hand in autistic children revealed that 63.6 % was loop pattern, 24.9% was whorl and 11.5% was arch. On the right hand of healthy children, the loop pattern of was 74%, the whorl was 19.1 % and arch was 6.9%. The fingerprints of left hand in autistic children revealed that the loop pattern was 66.4%, whorl was 22.4% and arch was

11.2%. The left hand of healthy children showed that the loop pattern was 70.4%, the whorl was 21.4% and arch was 8.2%. Nearly similar findings were seen.[2]

The significant increased frequency of whorl pattern and decreased arch pattern in autistic children were mentioned.[15]

The distribution of fingerprint pattern of right hand in autistic children by digit revealed that

the loop pattern was predominant on 1st, 2nd, 3rd and 5th digit while 4th digit showed predominant whorl pattern. The fingerprint pattern of left hand in autistic children by digit revealed that loop pattern was predominant on all the digits.

This study showed that, the loop pattern of healthy children was predominant on both hands.

The comparison of fingerprint pattern between the autistic and healthy children demonstrated that loop pattern was found statistically highly significant ($p < 0.001$) on both hands. The whorl and arch pattern of both hands was found statistically highly significant ($p < 0.001$).

Dissimilarity was also found in some cases.[11,14] The ATD angle of right hand < 45° was 80.9 % in autistic and 65.5% in healthy children, angle between 45º-56º was 17.3% in autistic and 30% in healthy children; angle > 56° was 1.8% in autistic and 4.5% in healthy children. The mean angle on right hand in autistic was 39.23º ± 2.5º and in healthy children was 43º.23° ± 4.5°. The ATD angle of the left hand, < 45° was 78.2 % in autistic and 70.9% in healthy children, angle between 45º-56º was 20.9 % in autistic and 20% in healthy children; angle > 56º was 0.9 % in autistic and 9.1% healthy children. The Mean angle was 39.34°±2.8° in autistic and 43.35°±7.5° in healthy children. Dissimilarity was found some study[2]. The comparison of ATD angle of both hands between autistic and healthy children was highly significant ($p < 0.001$).

Thye narrower ATD angle was observed (< 45º was 68.5% in autistic).[12]

Conclusion:

This study demonstrated that the fingerprint patterns of autistic children differ from healthy. In the autistic children, the loop pattern was 65 %, whorl was 23.6 %, and arch was 11.7%; in the healthy children, loop was 72.2 %, whorl was 20.3 % and arch was 7.5%. So, the loop pattern was predominant in both autistic and healthy children but relatively higher whorl and arch pattern were found in autistic children. Only the whorl pattern was predominant (59.1%) on 4th digit of right hand in autistic children. The ATD angle was narrower (< 45° was 80.9 % in autistic and 65.5% in healthy children) in autistic children than healthy (mean ATD angle was 38.23Ú ± 2.5Ú in autistic and 42.23Ú ± 4.5Ú in healthy children).

Limitation of the study:

The study was done only in Rajshahi district,

so the result was not represented the whole country. Sample size was small (Only 220). Modern technology like scanner machine was not possible to use, only traditional method was followed.

Recommendations:

Further extensive research might be done. A large sample size should be conducted to determine the prevalence of autism.

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Original Article

A PROSPECTIVE OBSERVATIONAL STUDY ON ADNEXAL MASSES -COMPARISON OF CLINICAL IMPRESSION, CA -125, ULTRASOUND FINDINGS AND HISTOPATHOLOGICAL DIAGNOSIS

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Key words:
Adnexal Mass, CA-125, Ultrasonogram, RMI, Histopathology

Abstract:

Adnexal mass may be found in women of all ages with a prevalence of 1:1000 in premenopausal group and 3:1000 in post menopausal group. The risk of malignancy increases with age. The current study was carried out in the department of Obstetrics and Gynaecology in Ad-din Women's Medical College Hospital, Maghbazar, Dhaka from Ist July 2023 to 30 th June 2024. It was a hospital based observational study which included 100 patients of adnexal masses who required surgery. The goal of the study was to compare sensitivity , specificity , predictive value of clinical evaluation , USG with colour Doppler, CA-125 ,RMI score and to compare them with histopatholoy. All cases were evaluated clinically, by Ultrasonogram with colour doppler ,CA-125 and RMI score. After surgery specimens were sent for histopathology and reports were compared with pre surgical evaluation. 93% cases were of ovarian origin and 7% were non ovarian cases. Histopathology reports showed that 68% adnexal masses were benign and 32% were malignant. The principle tool for evaluation of adnexal mass was Ultrasonogram with colour doppler which had the highest diagnostic accuracy(92%) . But clinical evaluation had the highest sensitivity(90.62%) and RMI score had the highest specificity(95.59%) .With these comparatively simple methods we can diagnose adnexal masses without expensive advanced imaging modalities.

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Introduction

An adnexal mass is a common issue in our gynaecological practice. It can be gynaecological or nongynaecological. The term adnexal mass is often used for the mass in the adnexa of the uterus and consists of the fallopian tube, ovary, and associated vessels, ligaments and connective tissue. Since the fallopian tubes, ovaries and their mesenteries are so closely related anatomically, they are often collectively called the adnexum (plural=adnexa).[1]

Adnexal masses are found in females of all ages.The differential diagnosis of adnexal masses include-Gynaecological: Ovarian origin- ovarian neoplasm ,ovarian cyst, endometrioma & tuboovarian mass . Non-ovarean origin: Uterine origin-uterine myoma, Tubal pathology-ectopic pregnancy, hydrosalpinx , tubal neoplasm. Non-gynaecological masses : GIT-appendicular mass, diverticulitis ,Genitourinary -pelvic kidney. Ovarian cancer is one of the most lethal gynaecological malignancy.[2]

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Evaluation of an adnexal mass needs a high index of suspicion and the primary goal is to exclude malignancy. A preoperative identification of the nature of the mass can be done before surgical intervention by clinical examination, sonography and CA-125.

Computerized tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET) can also be done in diagnosis of adnexal masses. But they are not suitable in every patient in low resource set up. However, histopathology is the gold standard for proper evaluation of adnexal masses.

The goal of this study was to find out the diagnostic value of Clinical Examination, ultrasonography & CA 125 and their correlation with histopathological diagnosis in adnexal masses.

Ultrasonogram is commonly used in patients with adnexal masses. Ultrasound combined with doppler measurements allows the experienced sonographer to reliably diagnose functional, benign, and malignant adnexal masses.[3] The sensitivity of USG is high but the specificity is low .

CA125 is a high molecular weight glycoprotein that has served as the main ovarian cancer biomarker for almost four decades. CA125 has played an important role in the screening, treatment, and follow-up phases of ovarian cancer management[2]. Normal level is 0-35 U/ml. CA 125 is produced in low quantities by normal ovarian epithelial cells, peritoneal lining cells, lining cells of GIT, pancreas, breast and lung. Thus an elevated level of CA 125 is not very specific. High levels of CA 125 are frequently associated with ovarian malignancy. But it is found to be elevated in breast cancer, lung cancer and various benign conditions . Due to poor specificity, CA125 values are not useful in screening the general population.

RMI (risk of malignancy index) is a reliable tool in differentiating benign from malignant adnexal masses.[4] It is simple, easy to use and cost effective. The RMI is a product of the ultrasound scan score, the menopausal status and the serum CA125 level (IU/ml). RMI = U x M x CA125 . The ultrasound result is scored 1 point for each of the following characteristics: multilocular cysts, solid areas, metastases, ascites and bilateral lesions. U = 0 (for an ultrasound score of 0), U = 1 (for an ultrasound score of 1), U = 3 (for an ultrasound score of 2 to 5). The menopausal status is scored as 1 = pre-menopausal and 3 = post-menopausal. The classification of 'post-menopausal' is a woman who has had no period for more than 1 year or a woman over 50 who has had a hysterectomy.

Methods:

This hospital based observational study was performed in the Department of Obstetrics and Gynaecology, Ad-din Women's Medical College Hospital, Dhaka . The study was conducted during the period of Ist July 2023 to 30 th June 2024.The study included 100 female patients who attended OPD of Department of Obstetrics and Gynaecology, Ad-din Women's Medical College Hospital, Dhaka with the diagnosis of adnexal mass.

Inclusion criteria

Female patients with adnexal masses who attended Gynaecological Outpatient Department , Ad-din Women's Medical College Hospital, Dhaka who required admission and operative intervention.

Exclusion criteria

- Patients who did not get operated
- Patients with masses from uterus , urinary tract or gastrointestinal tract.

An ultrasound examination with colour doppler was done to evaluate adnexal masses. Ultrasound findings regarding laterality, locularity, solid elements, presence of ascites and evidence of metastasis were assessed. Complete blood count , fasting and postprandial blood sugar, liver and renal function tests, beta human chorionic gonadotrophin (in suspicion of pregnancy) and serum CA 125 with a cut off value of 35 U/ml were done before surgery. RMI was calculated in the following way-

RMI score = Ultrasound
Score x menopausal
Score x CA125 level in U/ml

After surgery, specimen were sent for histopathology and the reports were compared with clinical, USG findings & CA 125 level.

Categorical variables were analysed using Chi square test . Sensitivity, Specificity, positive predictive value (PPV), negative predictive value (NPV) and diagnostic accuracy have been calculated to evaluate various methods. SPSS version 29 was used for the analysis of various data.

Results

The mean age of the patients was 39.12±12.33, minimum age was 16 years and maximum age was 75 years.

Table-I

Age distribution of Patients

Age Group	Number of Patients	Percentage
15-25	6	6
26-35	27	27
36-45	30	30
46-55	17	17
56-65	12	12
66-75	8	8
Total	100	100

The occurrence of adnexal mass was highest in 36-45 years of age group(30%).

The diagram (Figure 1) showed percentage of malignant adnexal masses increased with age.

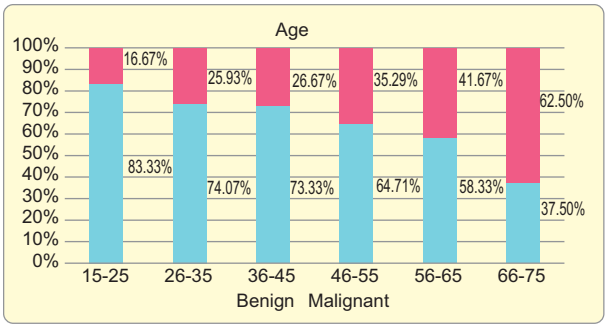

Figure 1: *Age distribution and histopathological Diagnosis*

Table-II

Presenting Features of Adnexal mass

Chief Complaints	Number	Percentage
Abdominal Pain	70	70
Abdominal swelling	21	21
Irregular Menstruation	16	16
Infertility	10	10
Gastrointestinal Symptoms	9	9
Others	6	6

The majority of patients had multiple symptoms. The most common clinical presentation in all adnexal masses were abdominal pain (70%) followed by abdominal swelling (21%). Other complains like irregular menstruation, infertility, gastrointestinal symptoms etc. were also found.

Table-III

Non ovarian mass

Pathology	Number	Percentage
Ectopic pregnancy	5	5
Broad ligament tumour	1	1
Hydrosalpinx	1	1
Total	7	7

Non ovarian masses accounted for 7% of adnexal masses.

Table-IV

Ovarian mass

Pathology	Number	Percentage
Non neoplastic	0	0
Neoplastic	93	93
Total	93	93

Table-V

Benign ovarian tumour (histology).

Benign tumour	Number	Percentage
Serous cyst adenoma	27	27
Mucinous cyst adenoma	14	14
Mature teratoma (dermoid)	20	20
Total	61	61

The occurrence of benign tumor in the present study was 61% and the most common benign tumor was serous cyst adenoma(27%).

Table-VI

Malignant ovarian tumour (histology).

Malignant tumour (histology)	Number	Percentage
Serous cyst adenocarcinoma	20	20
Mucinous cyst adenocarcinom	6	6
Dysgerminoma	4	4
Metastatic carcinoma	2	2
Total	32	32

The occurrence of malignant tumor in the present study was 32% and the most common malignant tumor was serous cyst adenocarcinoma.

Table-VII
Clinical Characteristics of Study population and Histopathology

Characteristics	Benign	Malignant	Row Total	P value
Urban/Rural				
Urban	39	20	59	0.6254^{ns}
Rural	29	12	41	
Education				
Illiterate	14	11	25	0.1374^{ns}
literate	54	21	75	
Social Status				
Lower	27	12	9	0.4008^{ns}
Middle	31	18	3	
Higher	10	2	12	
Marital Status				
Unmarried	56	24	80	0.3912^{ns}
Married	12	8	20	
Parity				
Nullipara	25	4	29	0.0058^{s}
primipara	13	3	16	
multipara	30	25	55	
Religion				
Muslim	41	19	60	0.9956^{ns}
Hindu	25	12	37	
Christian	2	1	3	
Menstruation				
Pre-menopausal	56	19	75	0.013^{S}
Menopausal	12	13	25	
Family H/O Malignancy				
Yes	11	19	30	0.00001^{S}
No	57	13	70	
Weight				
Underweight				
(BMI< than 18.5)	5	2	7	0.9740^{ns}
Normal				
(BMI18.5 - 24.9)	51	24	75	
Overweight				
(BMI 25-29.9)	12	6	18	
Clinical Diagnosis				
Benign	58	6	64	0.00001^{S}
Malignant	10	26	36	

P value was reached from Chi square test, s=significant, ns=not significant. Parity, menopausal status, family history and clinical diagnosis of malignancy were significantly correlated with malignancy.

Table-VIII

Evaluation of adnexal masses - Clinical assessment, sonographic features, CA-125 & RMI score versus histopathology

	True Positive	True Negative	False Positive	False Negative	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Accuracy
Clinical assessment	29	57	11	3	90.62	83.82	72.5	95	86
USG	27	65	3	5	84.38	94.59	90	92.86	92
CA 125	28	38	30	4	87.5	55.88	48.28	88.24	66
RMI	26	65	3	6	81.25	95.59	89.66	91.55	91

Table-IX

Histopathology and Per-operative findings

Histopathology	Per operative finding		Total	P value	Significance
	Benign	Malignant			
Benign	65	3	68	<0 .00001 [s]	Significant
Malignant	2	30	32		
Total	67	33	100		

P value was reached from Fisher's Exact Test. P value was < 0.00001. The result was significant at p < .05. So per operative finding was found significant in differentiating adnexal masses .

Our study showed that clinical assessment had highest sensitivity(90.62%) while RMI was most specific (95.59%)in detecting malignancy . But USG had highest diagnostic accuracy(92%) (Table 8).

Discussion

In the present study, 100 cases of female patients with adnexal masses undergoing surgical intervention were chosen . 93% were ovarian in origin and 7% were non ovarian origin. Among the ovarian neoplasms, 61% were benign, and 32 % were malignant. These findings are comparable with studies by Ray et al and Sharadha et al.[5,6]

The mean age of patients with malignant tumour was 45.36 years in our study which is similar to other studies done by Ray et al[5] and Radhamani et al[7]. Higher percentage of malignant ovarian tumours were found in postmenopausal women in the present study which is similar to other studies.[7,8]

Abdominal pain was the most common symptom followed by gradual swelling of abdomen.It was compatible with previous studies.[8]

The most common benign tumor was serous cyst adenoma(27%) followed by mature cystic teratoma. Serous cystadenocarcinoma was the most common malignant tumour of the ovary which was similar to other studies.[7,8]

In this study, parity, menopausal status, family history and clinical diagnosis of malignancy were significantly correlated with malignancy . These findings are comparable with studies by Ray et al.[5]

In our study sensitivity of clinical examination was found to be 90.62%, specificity was 83.82% , positive predictive value of clinical examination was only 72.5% but the accuracy was 86%. This is similar to the study by Balbi et al.[9]

USG had sensitivity of 84.38%, specificity of 94.59%, positive predictive value of 90%, negative predictive value of 92.86% and diagnostic accuracy of 92% which is comparable to studies by Ray et al (sensitivity of 83.33%, specificity of 97.14%, positive predictive value of 92.59%, negative predictive value of 93.15% and diagnostic accuracy of 93%)[5]. Similar results were shown in a study by Pourissa et al.[10] Colour Doppler increases the diagnostic accuracy of ultrasonography.

Serum CA-125 level is a valuable parameter for both diagnosis and monitoring of epithelial carcinoma. The overall sensitivity of CA-125 screening in distinguishing

benign from malignant adnexal masses reportedly ranges from 61% to 90%, specificity ranges from 71% to 93%,positive predictive value ranges from 35% to 91% and negative predictive value ranges from 67% - 90%.[11] In our study sensitivity (87.5%) was similar, but specificity (55.88%) was low when compared to other studies. [12,13] But positive predictive value and negative predictive value were similar.

RMI score based on menopausal status, ultrasound findings and serum CA125 is an easily applicable method in the primary evaluation of patients with adnexal masses, resulting in timely referral to gynecological oncology centers for suitable surgical operations. In our study RMI had a sensitivity of 81.25%, specificity 95.59%, positive predictive value 89.66%, negative predictive value 91.55% and diagnostic accuracy of 91% which is similar to studies by Ray at al(sensitivity of 71.05% and a specificity of 95.16%)[5] and Hemeda et al(sensitivity of 70.5%, specificity of 93.5%)[14]. Thus as per our results, RMI scoring must be done in every patients with adnexal mass .

Limitations

The study was hospital based observational study and further follow-up were not done. Study population was small.This study used only a single tumor marker i.e.CA 125 for the study and no other markers were evaluated.

Conclusion

In case of adnexal mass timely appropriate diagnosis is essential to avoid malignancy related mortality. Majority of adnexal masses were of ovarian origin. Ovarian malignancy is the leading cause of death . Tumour markers are not effective screening modality for ovarian malignancy. Clinical examination has a high sensitivity but it has a poor positive predictive value. Ultrasonography has high specificity. It is the main diagnostic imaging modality prior to treatment. Risk of malignancy index is a simple, non-invasive and easily applicable diagnostic scoring index in discriminating benign and malignant lesions.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Case Report

A SUBTLE AND DELAYED PRESENTATION OF SCAR RUPTURE AFTER VBAC: A CASE REPORT

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Caesarean section; case reports; Postpartum; rupture; scar

Abstract:

Uterine scar dehiscence is the opening of the uterine incision. It is potentially a life-threatening complication. Though it is a rare complication of caesarean section but nowadays it is increasing as caesarean delivery is also increasing. It is more common following vaginal birth after caesarean (VBAC). It leads to postpartum hemorrhage, pelvic hematoma, pelvic abscess, endomyometritis, generalized and localized peritonitis and sepsis. Here we report a case of a 25 year old female who presents with abdominal distention with pyrexia following VBAC. Investigation revealed incomplete uterine scar rupture and huge ascites with left sided mild pleural effusion. The case was managed by laparotomy and drainage of about 6L of encysted pus.

Worldwide the rate of caesarean section is increasing. At the same time complications of Lower Segment Caesarean Section (LSCS) are also rising. Among the complications uterine scar dehiscence or rupture is dangerous but rare complication. It is the opening of the uterine incision line involving all layers of the uterus and the frequency is about 0.3%. This risk increases following vaginal birth after caesarean section (VBAC). It occurs in 0.47%. [1] It can leads to PPH, pelvic hematoma, pelvic abscess, endomyometritis, generalized or localized peritonitis and sepsis. Published cases have shown that the patients developed acute abdominal distention after VBAC. Management includes at first with antibiotics; subsequently, laparotomy. We hereby report a case of uterine scan rupture after VBAC, which was managed by laparotomy and drainage of pus.

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Introduction:

Worldwide the rate of caesarean section is increasing. At the same time complications of Lower Segment Caesarean Section (LSCS) are also rising. Among the complications uterine scar dehiscence or rupture is dangerous but rare complication. It is the opening of the uterine incision line involving all layers of the uterus and the frequency is about 0.3%. This risk increases following vaginal birth after caesarean section (VBAC). It occurs in 0.47%.[1] It can leads to PPH, pelvic hematoma, pelvic abscess, endomyometritis, generalized or localized peritonitis and sepsis. Published cases have shown that the patients developed acute abdominal distention after VBAC. Management includes at first with antibiotics; subsequently, laparotomy. We hereby report a case of uterine scan rupture after VBAC, which was managed by laparotomy and drainage of pus.

Case report

A 25 years old women with obstetric index of para 2 was referred to Department of Gynae and Obstetrics, East West Medical College Hospital on 27th October, 2024 from Rangpur medical college for acute

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abdominal distention vaginal delivery after caesarean (VBAC) at Lalmonirhat of Rangpur district. Women got a child of 4 years delivered by caesarean section. Second one was a twin pregnancy. Her labor pain started on 22/09/24 at her 36+ weeks pregnancy and she set off to a nearby hospital. She had viral hepatitis at that moment (S. bilirubin was 2.7 mmol/L). But on the way she delivered normally in the car. Then she developed Postpartum Hemorrhage. After heading to the hospital they did medical management of PPH and repaired the perineal tear. She was discharged from the clinic on 24/09/24. She was admitted to Rangpur medical college on 01.10.24 due to abdominal distension. Conservative treatment with antibiotics was given. USG of the whole abdomen was done on 19.10.24 which shows incomplete uterine rupture at the site of previous uterine scar with huge ascites with left sided pleural effusion (figure 1 & 2). A CT scan of abdomen was done on 10.10.24 at Rangpur which revealed Bulky uterus with endometrial collection with splenomegaly with huge ascites. Patient was referred to medicine department. They started treatment with Tab. Furosemide + Spironolactone 20/50 mg and Tab. Ursodeoxycholic Acid 150 mg and syrup Lactulose. Ascitic fluid for ADA, glucose, protein were in normal range. On cytology of ascitic fluid, no organism detected, AFB not found and only RBC present. Patient was referred to BSMMU on 14.10.24 for further treatment. On 27/10/2024 this lady was admitted to our hospital with abdominal distention, mild pyrexia, mild abdominal pain. At the time of presentation, the temperature was 100.9 F. Abdomen was hugely distended (abdominal girth at umbilicus 81.5cm), fluid thrill was present. On palpation the abdomen was mildly tender. Patient was clinically anemic.

On investigation, the Hb% was 7.3 g/dL, ESR 51 mm in first hour, WBC count was 11070 /cumm, total platelet count 6,51,000/cumm, S.bilirubin, S creatinine, SGPT were in normal range. These WBC and platelet counts indicate secondary infection. USG showed hugely organized collection with minimal ascites, bulky uterus with mild endometrial collection. Second CT scan done on 27.10.24 which showed large cystic abdominal mass (22x20) cm with air fluid levels and trapped bubbles are noted in abdominal cavity extending up to umbilical region, bulky uterus with endometrial collection and mild ascites. After 2 units of blood transfusion her Hb% was 11 g/dL, WBC count was 22960 /cumm.

On 28.10.24 her laparotomy was done by a team of Gynaecologists and Surgeon. On opening the abdomen there was thick walled encysted mass occupying whole abdomen and sealed in all side. Incision was made on encysted mass and about 6L of yellowish thick pus came out. Pus was sent for C/S and the wall of the cyst was sent for Histopathology. But uterus and adnexa, bladder all were inflamed tissue. After adequate drainage and surgical toileting with normal saline, two drain tube was kept in situ. Abdomen was closed in layers. Post-operative period was uneventful. She was on Meropenem Trihydrate, Metronidazole and Amikacin. (On 3.11.24 her blood picture showed total WBC count 12,000/cumm and platelet count 6,00,000/cumm. Pus was coming through 2 drain tube of about 2.5L/day). Her abdomen was soft, non-tender. Bowel sound was present on 2nd POD. Oral feeding started. Her bladder voided and bowel moved. She was apyrexic. Patient was discharged on 7th Post-operative day, though pus was coming

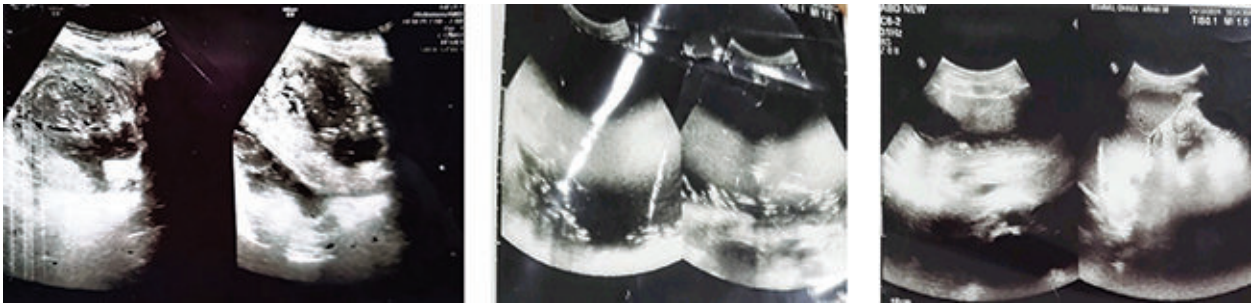

Figure 1 & 2: *Uterus: Bulky in size (A/P 5.73cm). Mild endometrial collection with echogenic component within. Peritoneal Cavity: Huge collection containing echogenic component & debri are noted in the peritoneal cavity.*

through drain tube, it was less than previous amount. On discharge check dressing was done and it was healthy. On 14th POD stitches were removed. On 15th POD her vitals are okay but still now about 300ml of pus was coming through drain tube daily. On 20th POD drain tube showed no collection. On 25th POD drain tube was removed. Patient clinically improved.

Discussion

Postpartum uterine scar rupture is rare but potentially life threatening condition characterized by the opening of all the layers of uterus. There are many risk factors including diabetes, surgical technique, infection, hematoma on incision site, VBAC, inappropriate oxytocin administration.

A study reported three cases of post-caesarean uterine scar dehiscence managed conservatively. All three cases present 1-2 weeks following caesarean section with complaints of abdominal pain and purulent vaginal discharge. All cases were managed with intravenous antibiotics and were discharged within 2-4 weeks. Various imaging modalities such as USG, magnetic resonance imaging and computed tomography can be used for detection of post caesarean scar rupture.

For diagnosis of uterine scar rupture we can do exploratory laparotomy. We can also treat at the same time. However, in case of marked wound infection, endomyometristis hysterectomy may be needed. Conservative approach with intravenous antibiotics and drainage of pelvic collection can be considered in stable patients.

Conclusion:

This case report highlights a rare but important complication of VBAC. As this condition seldom occurs there is no routine guideline for management of the case. Different diagnostic tools and multidisciplinary approach is helpful for diagnosis and treatment. It is recommended that VBAC patient should have hospital management with continuous fetal and maternal monitoring.

Disclosures

Consent was obtained by the participant in this study.

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Case Report

AUTOIMMUNE POLYENDOCRINE SYNDROME TYPE 3: A CASE REPORT

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Abstract:

Idiopathic thrombocytopenic purpura (ITP) is a condition characterized by a low platelet count, leading to an increased risk of bleeding. Despite having a shared autoimmune aetiology, documented cases of ITP alongside other autoimmune diseases are scarce. Here, we describe the case of a 55-year-old Bangladeshi woman who presented with bleeding symptoms and generalized weakness. On query, she gave a history of dry eye and dry mouth. She was a known case of hypothyroidism and ischaemic heart disease. After comprehensive evaluation, she was diagnosed with Autoimmune Polyendocrine Syndrome (APS)/Multiple Autoimmune Syndrome (MAS) Type 3, which included acute idiopathic thrombocytopenic purpura, Sjogren's syndrome, Hashimoto's thyroiditis, an old antero-septal myocardial infarction, dyslipidemia, and grade I fatty liver disease. Treatment involved a combination of immunosuppressive therapy, thrombopoietin receptor agonists (TPO-RA) - eltrombopag, platelet transfusion, levothyroxine, and supportive measures leading to successful management. This case highlights the challenge of addressing multiple autoimmune conditions concurrently and stresses the importance of comprehensive evaluation and multidisciplinary care to diagnose and manage these complex presentations accurately. Notably, patients with a autoimmune disease may harbour other undiagnosed autoimmune conditions and face an elevated risk of malignancy in the future. Despite this, in Bangladesh, the prevalence of autoimmune diseases, including APS/MAS, remains poorly understood. Further research is crucial to elucidate the epidemiology and clinical characteristics of autoimmune diseases associated with APS/MAS in this population, enhancing our ability to provide effective care and public health interventions.

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Introduction

Idiopathic thrombocytopenic purpura (ITP) is an autoimmune disorder characterized by immune-mediated destruction of platelets, leading to thrombocytopenia and an increased risk of bleeding.[1] While the exact aetiology of ITP remains unclear, it is believed to involve the production of autoantibodies against platelet surface antigens, leading to their destruction by the reticuloendothelial system.[1,2]

Autoimmune diseases are characterized by an abnormal immune response against self-antigens, resulting in tissue damage and dysfunction. They often coexist within individuals, suggesting shared pathogenic mechanisms.[3] There is also an increased risk of cancer in patients with primary ITP.[9] The coexistence of multiple autoimmune diseases poses diagnostic and therapeutic challenges due to overlapping clinical features and potential treatment interactions.

Case Report:

A 55-year-old, normotensive, non-diabetic, Bangladeshi female presented with a history of bleeding manifestations and generalized weakness and was brought to Shaheed Suhrawardy Medical College Hospital in February 2024. She had complaints of bleeding manifestations for the

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last 7 days and multiple purplish rashes for 1 month and generalized weakness for 2 years. She recounted 2 episodes of epistaxis, which were spontaneous, unprovoked, and resolved after applying pressure to the nasal bridge. At the same time, there was also spontaneous gum bleeding, without gum hypertrophy. She also complained of multiple ecchymoses and purpura throughout her body for the past month. These began as multiple red petechiae on both legs and gradually spread to the rest of the body. The rashes were of various sizes, non-itchy, not photosensitive, painless, non-blanchable, and non-palpable. There was no history of trauma, respiratory distress, allergy, oral ulcers or any new drugs. On query, there was a history of fever 15 days back. She also complained of weakness for about 2 years. There was no swelling, fatigability with diurnal variation, or any heat/cold intolerance. She gave no history of weight gain or loss, and her appetite was normal. Her bladder and bowel habits were normals. There was no history of taking any steroids. She gave a history of occasionally itchy, gritty, and foreign body sensations in both her eyes for the last 2 months associated with a dry mouth for the same duration. Additionally, she had no features of polyarthritis, Raynaud's phenomenon, skin tightening, thickening, or induration, hyper or hypopigmentation, frothy or high-coloured urination, palpitation, seizure, or loss of consciousness. She had a known case of hypothyroidism (2 years) and previously had a myocardial infarction (2012) and a spontaneous abortion (2000). She was already on treatment with Levothyroxine, antiplatelet and lipid-lowering agents. Although she was diagnosed with primary hypothyroidism, autoantibodies had not been previously tested.

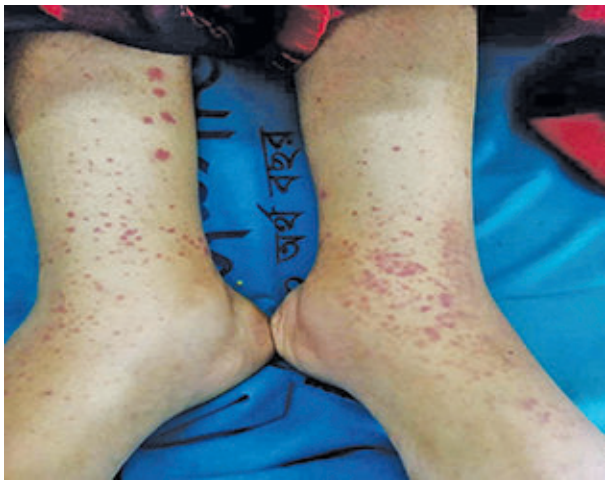

Figure 1: *Petechial rash on legs*

Systemic examination revealed that blood pressure was 110/60 mmHg without postural drop, radial pulse was 88 bpm and regular, respiratory rate was 14 breaths/min, SpO2 was 96% on air, and temperature was 98 F. The patient was mildly anaemic and had non-pitting oedema. There were no palpable lymph nodes or bony tenderness. Skin survey revelaed bleeding spots on the gum & palate, as well as multiple purpuric rashes across the arms, legs, back and trunk. Schirmer's Test was positive in both eyes. Fundoscopy was normal.

Investigations revealed haemoglobin 11.2 gm/dl, total white cells 7970/cmm, platelet <5000/cmm, erythrocyte sedimentation rate 83 mm/1st hour, TSH 17.10 µIU/ml, FT4 1.11 ng/dL, Anti-TPO Ab 149.48 IU/ml (positive), total cholesterol 292.1 mg/dl, triglycerides 261.8 mg/dl, HDL Cholesterol 33.9 mg/dl, LDL Cholesterol 205.84 mg/dl. Peripheral blood film showed gross thrombocytopenia. All other routine investigations, including c-reactive protein, serum creatinine, serum electrolytes, uric acid, serum creatinine phosphokinase, SGPT, serum albumin, random blood sugar, serum calcium, serum inorganic phosphates, prothrombin time, and APTT were within normal limits. Chest X-ray, Urine RME, and Blood cultures were normal. ECG showed old anteroseptal myocardial infarction, ultrasonography of the whole abdomen showed fatty liver disease (grade I); ultrasonography of the thyroid gland showed a small isoechoic nodule in the left lobe of the thyroid and small lymph nodes in both submandibular regions. Dengue and viral hepatitis serology were negative. Coomb's Test was negative. Autoimmune profile showed ANA 11.40 U/ml, Anti dsDNA 8.50 IU/ml, ENA profile showed positive SS-A/Ro60KD, SS-A/Ro52KD, SS-B/La and PM-Scl. Additionally, Complement 3 (C3) 1.64 g/L, Complement 4 (C4) 0.14 g/L, 24hr UTP 0.17g/24hr, Lupus Anticoagulant, Anti-Cardiolipin IgM & IgG were negative.

She was treated with methylprednisolone (500mg) for 3 days followed by prednisolone (50mg) orally, eltrombopag (50mg), pilocarpine (15mg), carboxymethylcellulose eye drops, rosuvastatin (10mg), bisoprolol (2.5mg), omeprazole (20mg), and levothyroxine (100mcg). Eltrombopag was stopped following advice from Rheumatology. 3 units of platelets were transfused. All bleeding manifestations resolved after two days of the initiation of a high-dose steroid. After 3 days of treatment, the platelet count was

Investigation	Result	Normal Range
Haemoglobin	11.2 gm/dL	13.0 -17.0 g/dL
Total White Cells	7970/cmm	4000 - 10000/cmm
Platelet Count	<5000/cmm	150000-400000/cmm
Erythrocyte Sedimentation Rate (ESR)	83 mm/1st hour	<20 mm/1st hour
TSH	17.10 µIU/mL	0.3 - 5.50 µIU/mL
FT4	1.11 ng/dL	0.71 - 1.85 ng/dL
Anti-TPO Ab	149.48 IU/mL	< 5.61 IU/mL
Total Cholesterol	292.1 mg/dL	130 - 200 mg/dL
Triglycerides	261.8 mg/dL	50 - 150 mg/dL
HDL Cholesterol	33.9 mg/dL	>35 mg/dL
LDL Cholesterol	205.84 mg/dL	<100 mg/dL
Peripheral Blood Film	Gross thrombocytopenia	-
C-reactive Protein	3.0 mg/dL	< 5.0 mg/dL
Serum Creatinine	0.96 mg/dL	0.5 - 0.9 mg/dL
Serum Electrolytes	Within normal limits	-
Uric Acid	5.0 mg/dL	2.4 - 5.7 mg/dL
Creatinine Phosphokinase (CPK)	23 U/L	30 - 135 U/L
ALT (SGPT)	23 U/L	<40 U/L
Serum Albumin	3.9 g/dL	3.4 - 5.4 g/dL
Random Blood Sugar	6.3 mmol/L	< 7.8 mmol/L
Serum Calcium	9.11 mg/dL	8.80 - 10.60 mg/dL
Serum Inorganic Phosphates	3.1 mg/dL	2.5 - 4.5 mg/dL
Parathyroid Hormone(PTH)	76.10 pg/mL	9 - 80 pg/mL
Prothrombin Time and APTT	Normal	-
Chest X-ray	Normal	-
Urine RME	Normal	-
Blood Cultures	No Growth	-
ECG	Old anteroseptal myocardial infarction	-
Ultrasonography (whole abdomen)	Fatty liver disease (grade I)	-
Ultrasonography (thyroid gland)	Small isoechoic nodule in left lobe; Small lymph nodes in both submandibular regions	-
Dengue Serology	Dengue IgM - Negative Dengue IgG - Negative	-
Viral Hepatitis Serology	HBsAg - Negative Anti-HCV - Negative	-
Coomb's Test (Direct)	Negative	-
Anti-Nuclear Ab(ANA)	11.40 U/ml	Negative: < 1.0 U/ml Borderline: 1.0-1.2 U/ml Positive: > 1.2 U/ml
Anti-ds DNA	8.50 IU/ml	Negative: < 20 IU/ml Equivocal: 20-25 IU/ml Positive: > 25 IU/ml
ENA Profile	Positive: SS-A/Ro60KD SS-A/Ro52KD SS-B/La PM-Scl	-
Complement 3 (C3)	1.64 g/L	0.90 - 1.80
Complement 4 (C4)	0.14 g/L	0.10 - 0.40
24hr UTP	0.17 g/24 hours	<0.15 g/24 hours
Lupus Anticoagulant	Negative	-
Anti-Cardiolipin IgMAnti-Cardiolipin IgG	Negative	-
Peripheral Blood Film	Gross Thrombocytopaenia	-
Bone Marrow Biopsy(on Day 10 of therapy)	Normal Active Marrow	-

15,000/cmm, at 2 weeks 75,000/cmm, and 160,000/cmm at 3 weeks. A repeat peripheral blood film showed only mild thrombocytopaenia. A bone marrow biopsy was carried out after 10 days of treatment and showed normal marrow activity. While Anti-Platelet Antibody could not be tested due to limited availability, the rapid improvement to steroids suggested a clinical diagnosis of immune-mediated thrombocytopenia. This was diagnosed as a case of Autoimmune Polyendocrine Syndrome (APS)/Multiple Autoimmune Syndrome (MAS) Type 3 (comprising Acute Idiopathic Thrombocytic Purpura, Sjogren's syndrome, Hashimoto's Thyroiditis), Old Antero-Septal Myocardial Infarction, Dyslipidemia, and Fatty Liver Disease (Grade I).

Discussion:

The presented case illustrates a complex clinical scenario involving the coexistence of idiopathic thrombocytopenic purpura with multiple autoimmune diseases. The patient's history, clinical presentation, and laboratory findings are consistent with acute ITP, Sjogren syndrome, Hashimoto's thyroiditis, old antero-septal myocardial infarction, dyslipidemia, and grade I fatty liver disease.

Idiopathic thrombocytopenic purpura is a serious acquired autoimmune disorder characterized by a low platelet count (thrombocytopenia) and mucocutaneous bleeding.[1,2] It is commonly assumed that ITP results from autoantibodies causing accelerated platelet destruction. Recent data suggest that autoantibodies may also inhibit platelet production.[13] ITP is traditionally divided into acute and chronic forms, based on the duration of thrombocytopenia (i.e., less than 6 months for acute and more than 6 months for chronic). ITP is generally acute in young children and typically, occurs a few days to a few weeks after an infection (e.g., varicella zoster virus, viral cold). ITP in children is thought to be a benign and self-limiting disorder with an excellent prognosis. In contrast, ITP in adults is primarily chronic, and the onset is often asymptomatic. The disease is more prevalent in females than males. The diagnosis of ITP is clinical and is very often based on the exclusion of other causes of thrombocytopenia.[12] There are no standard tests to diagnose ITP, with anti-platelet antibodies having low sensitivity (53%) but high specificity (>90%). A positive autoantibody test can be useful for ruling in ITP, but a negative test does not rule out ITP.[15]

The association between ITP and other autoimmune conditions has been documented in the literature.[4] Sjogren syndrome, characterized by lymphocytic infiltration of exocrine glands leading to dry eyes and mouth[5], frequently coexists with ITP. Similarly, Hashimoto's thyroiditis, an autoimmune disorder affecting the thyroid gland, has been reported in patients with ITP. The underlying mechanisms linking these autoimmune diseases remain poorly understood but likely involve shared genetic predisposition and dysregulation of immune responses. Prevalence of ITP has been reported to range from 7% to 30% in systemic lupus erythematosus (SLE) patients, and several groups have studied the clinical characteristics of ITP in SLE patients. However, clinical characteristics of ITP in other autoimmune diseases such as Sjogren syndrome (SS) and the difference between ITP associated with different autoimmune diseases are still not very clear.[14]

Similar cases of ITP coexisting with multiple autoimmune diseases have been reported globally. In Spain, cases of ITP with concurrent autoimmune thyroiditis and Sjogren syndrome were documented, mirroring our patient's presentation. In Western countries, associations between ITP and systemic lupus erythematosus, rheumatoid arthritis, and autoimmune hepatitis have been described, highlighting the diverse spectrum of autoimmune comorbidities in patients with ITP.[5] There is also the possibility of developing pernicious anaemia in patients suffering from chronic ITP.[8] Furthermore, all the diagnosed autoimmune conditions confer a higher risk of cancer, particularly haematological malignancies.[9,10,11]

Sjögren's syndrome is relatively often classified as a part of autoimmune syndromes.[16] Sjögren's syndrome is probably the most frequent disease of connective tissue associated with AITD, especially with Hashimoto's disease.[17] During more than 10 years of examination, Lazarus et al. found that in a cohort of 114 patients with SS, c. 40% of patients had another autoimmune disease and AITD patients comprised the largest group (16%).[18] The most common manifestation of AITD in SS was hypothyroidism. In most cases it was diagnosed before SS. Similar results were obtained by Ramos-Casals et al. in a group of patients with SS 20% of the them had AITD and 16% had non-AITD. This confirms that more than 1/3 of the patients with SS also suffered from thyroid diseases, the most frequent manifestation of which

Table-I

First classification of PGAD or APS according to Neufeld and Blizzard (1980)

Type	Features
1	Candidiasis, hypoparathyroidism, Addison's disease (two or three present)
2	Addison's disease + Thyroid autoimmune diseases and/or type 1 diabetes mellitus
3	Thyroid autoimmune diseases + (3A) Type 1 diabetes mellitus (3B) Pernicious anemia (3C) Vitiligo, alopecia, and/or other organ-specific autoimmune diseases
4	Two or more organ-specific autoimmune diseases not falling into types 1, 2, or 3 PGAD polyglandular autoimmune diseases, APS autoimmune polyglandular syndromes

was subclinical hypothyroidism.[19] Hashimoto's coexistence with SS is relatively well documented. Additionally, it is interesting that both disorders share similar symptoms and even nonspecific antibodies (e.g. anti-nuclear antibodies, rheumatoid factor – RF). Symptoms such as keratoconjunctivitis and xerostomia are reported by as many as 30% of the patients with autoimmune thyroid disease. Positive anti-nuclear antibodies are present in as many as 20–55% of patients with AITD; therefore, they have to be monitored due to a high risk of development of other autoimmune diseases, including SS.[20]

Autoimmune Polyendocrine Syndromes (APSs), also called polyglandular autoimmune syndromes (PGASs), are a group of autoimmune diseases mainly involving the endocrine organs, but also frequently affecting the skin and musculoskeletal system. Neufeld & Blizzard first described the syndrome in 1980 when only two forms of APS were proposed.[24] Since then there have been several developments, including the discovery of the autoimmune regulator gene (AIRE) gene thought to be responsible for APS.[22-25] When the majority of the autoimmune conditions are rheumatological or dermatological, they are often referred to as Multiple Autoimmune Syndrome (MAS) instead.[21,26-27]

Autoimmune Polyendocrine Syndrome (APS) is classified into three main types:

- APS Type 1: Typically manifests in childhood with features like chronic mucocutaneous candidiasis, hypoparathyroidism, and Addison's disease.
- APS Type 2: Usually appears in adulthood and includes Addison's disease, autoimmune thyroid disease, and type 1 diabetes.
- APS Type 3: Characterized by autoimmune thyroiditis with other autoimmune diseases, excluding Addison's disease.

APS Type 3 is further subdivided into 4 types:

Autoimmune thyroid diseases (AITD) and

- APS (3a): Other autoimmune endocrine diseases(excluding Addison's disease)
- APS (3b): Other autoimmune gastrointestinal, hepatic, or pancreatic diseases
- APS (3c): Other autoimmune diseases of the skin, central nervous system, or hematopoietic system
- APS (3d): Other autoimmune rheumatic and cardiovascular diseases or vasculitis

There are also other types of APS:

- PEX Syndrome: This X-linked recessive disorder is caused by mutations in the FOXP3 gene and primarily affects males. It can lead to severe autoimmune activity against multiple organs
- POEMS Syndrome: Polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, skin changes

Multiple Autoimmune Syndrome (MAS) was first defined by Cojocaru et al. in 2010 as when an individual has three or more autoimmune diseases.[21] It was initially classified as:

- Type 1 MAS: Includes myasthenia gravis, thymoma, polymyositis, and giant cell myocarditis.
- Type 2 MAS: Includes Sjögren's syndrome, rheumatoid arthritis (RA), primary biliary cirrhosis

(PBC), scleroderma, and autoimmune thyroid disease.

- Type 3 MAS: Groups autoimmune thyroid disease with conditions like myasthenia gravis, Sjögren's syndrome, pernicious anaemia, ITP, Addison's disease, type 1 diabetes mellitus, vitiligo, autoimmune hemolytic anaemia (AIHA), systemic lupus erythematosus (SLE), and dermatitis herpetiformis.

However, since then, Autoimmune Polyendocrine Syndrome (APS) and Multiple Autoimmune Syndrome (MAS) have often been used interchangeably.[26] Subsequent research into the genetics of multiple autoimmune patients has yielded similar involvement of HLA haplotypes and alleles, suggesting that the two are indeed the same condition.[28,29] A further fourth type, Type 4 APS/MAS, has been proposed to fit any other autoimmune disease combination not included in the previous classifications.[26]

The management of patients with multiple autoimmune diseases necessitates a multidisciplinary approach involving haematologists, rheumatologists, endocrinologists, and other specialists. Treatment strategies aim to suppress immune-mediated inflammation while addressing organ-specific manifestations and complications. Corticosteroids, immunomodulators, cytotoxic and biologic agents may be employed, tailored to individual patient needs and disease severity.[6] Specific treatments for ITP also include thrombopoietin receptor agonists(TPO-RA) namely eltrombopag and romiplostim, biologics (rituximab) and splenectomy in refractory cases.[1] Interestingly, case series have shown that the number of autoimmune conditions does not correlate with the severity of the disease; in fact, most patients only have mild clinical features relative to the number of autoimmune conditions.[30]

In Bangladesh, the prevalence of autoimmune diseases, including APS/MAS, needs to be better studied. Limited epidemiological data hinder our understanding of the true burden of autoimmune disorders in the population. During our literature review, we found only a handful of publications on APS/MAS in Bangladeshi adults and none any similar publications involving ITP and other autoimmune disorders. This case underscores the importance of conducting further research to elucidate the epidemiology and clinical characteristics of autoimmune diseases in Bangladesh.[7]

Conclusion:

In conclusion, this case highlights the complexity of autoimmune disorders and the challenges associated with managing multiple autoimmune conditions concurrently. The presence of one autoimmune disease should alert the physician to investigate for additional autoimmune conditions because a high degree of clinical suspicion is needed to diagnose multiple coexisting autoimmune disorders. Comprehensive evaluation, accurate diagnosis, and multidisciplinary care are essential for optimising patient outcomes in such cases.

We report a case of adult idiopathic thrombocytopenic purpura with multiple autoimmune diseases, diagnosed as Autoimmune Polyendocrine Syndrome (APS) Type 3, including Sjogren syndrome and Hashimoto's thyroiditis. This case highlights the complexity of managing multiple autoimmune conditions concurrently and underscores the importance of a thorough evaluation and a multidisciplinary approach. Further research is needed to elucidate the underlying mechanisms and optimal management strategies for patients with concurrent autoimmune diseases.

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Case Report

COVID-19 PNEUMONIA WITH ENCEPHALITIS PRESENTING AS ACUTE STROKE WITH RIGHT SIDED HEMIPARESIS - A RARE CASE PRESENTATION

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Abstract:

Acute stroke remains a medical emergency even during the COVID-19 pandemic. Most patients with COVID-19 infection present with constitutional and respiratory symptoms; while others present with atypical gastrointestinal, cardiovascular, or neurological manifestations. Here we are presenting a case of COVID-19 Pneumonia with Encephalitis in a 37 year old male, who presented initially with weakness of right side of the body & slurring of speech; with history of fever for 2 days 10 days back. Diagnosis was confirmed by RT-PCR for COVID 19, HRCT Chest & MRI of Brain. Antiviral medications along with steroid & anticonvulsant were started immediately after the diagnosis and the patient responded very well with subsidence of fever and feeling of well-being.

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Introduction

Beta-coronaviruses are a common cause of self-limited respiratory tract infection, but the strains responsible for the Middle Eastern respiratory syndrome (MERS-CoV), the severe acute respiratory syndrome (SARS-CoV-1), and COVID-19 (SARS-CoV-2) cause more severe disease[1]. The COVID-19 pandemic, which broke out in Wuhan in 2019, has become the global health crisis of our time. Elderly patients with certain fundamental diseases are more likely to develop severe cases. The secondary lesion following viral infection have only rarely been reported.

Case report

A 37 year muslim male was admitted into the Medicine ward of Uttara Adhunik medical College Hospital on 20.06.2021 with the complaints of weakness of right side of the body, slurring of speech & occasional headache for 2 days. He suddenly developed weakness on right side of his body , initially right upper limb, then right lower limb. Since then he was unable to move or walk. He had slurring of speech. The patient had headache for the same duration which was global, persistent, moderate in intensity. He also had fever for 2 days 10 days back which was intermittent, low grade, highest recorded temperature was 99.5®F and subsided after taking paracetamol. On query, occasional cough found which was non-productive, no chest pain, no breathlessness, no coughing out of blood present. He had neck pain but no joint pain or skin rash. There is no bowel and bladder abnormality. There's no history of weight loss, loss of consciousness, convulsion, trauma to head, nausea, vomiting and double vision.

On General examination, patient was ill looking, non-anaemic, non-icteric & vitals were as such - Pulse: 88 beats/min, BP: 130/80, Respiratory rate: 16 breaths/min, Temperature: 99®F, SpO2 96% on air during admission.

On systemic examination of the nervous system, he was conscious & oriented with slurring of speech.

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Cranial nerve VII showed UMNL on right side, other cranial nerves were intact. Muscle tone decreased in right upper and lower limb. Muscle power diminished – Upper limb 3/5, Lower limb 2/5. All jerks of right side were exaggerated & Planter reflex was extensor. All the reflexes of left upper & lower limb were intact. Co-ordination couldn't perform due to decrease muscle power, Sensory system was intact. Gait was hemiplegic & no signs of meningeal irritation found.

Other system examination showed no abnormality.

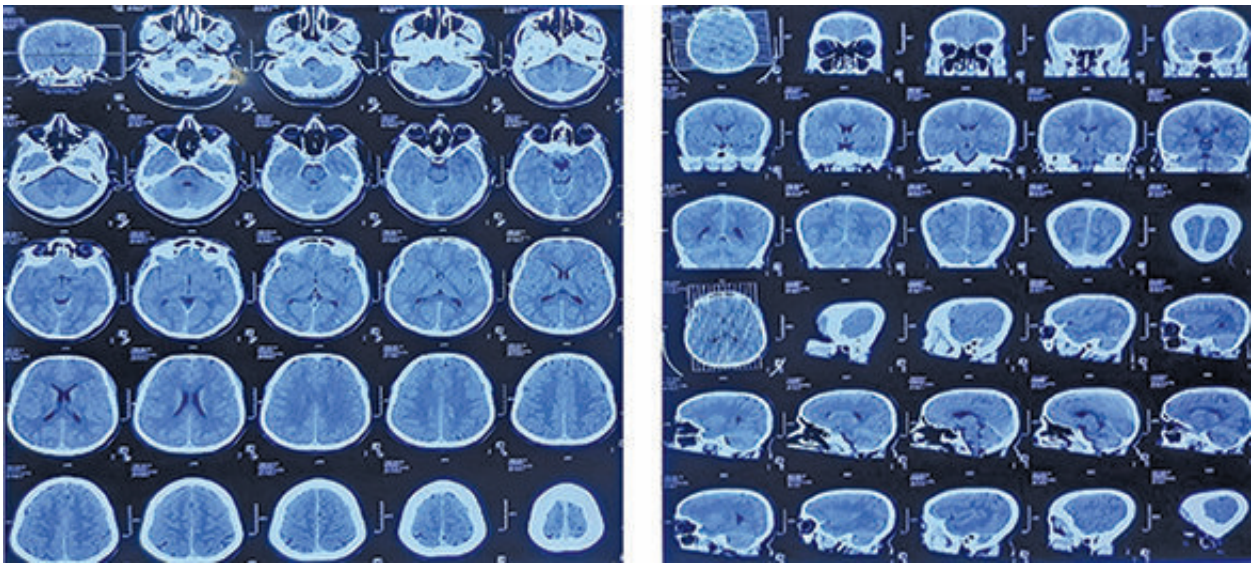

Figure 1: *CT Scan of Brain reveals no abnormality.*

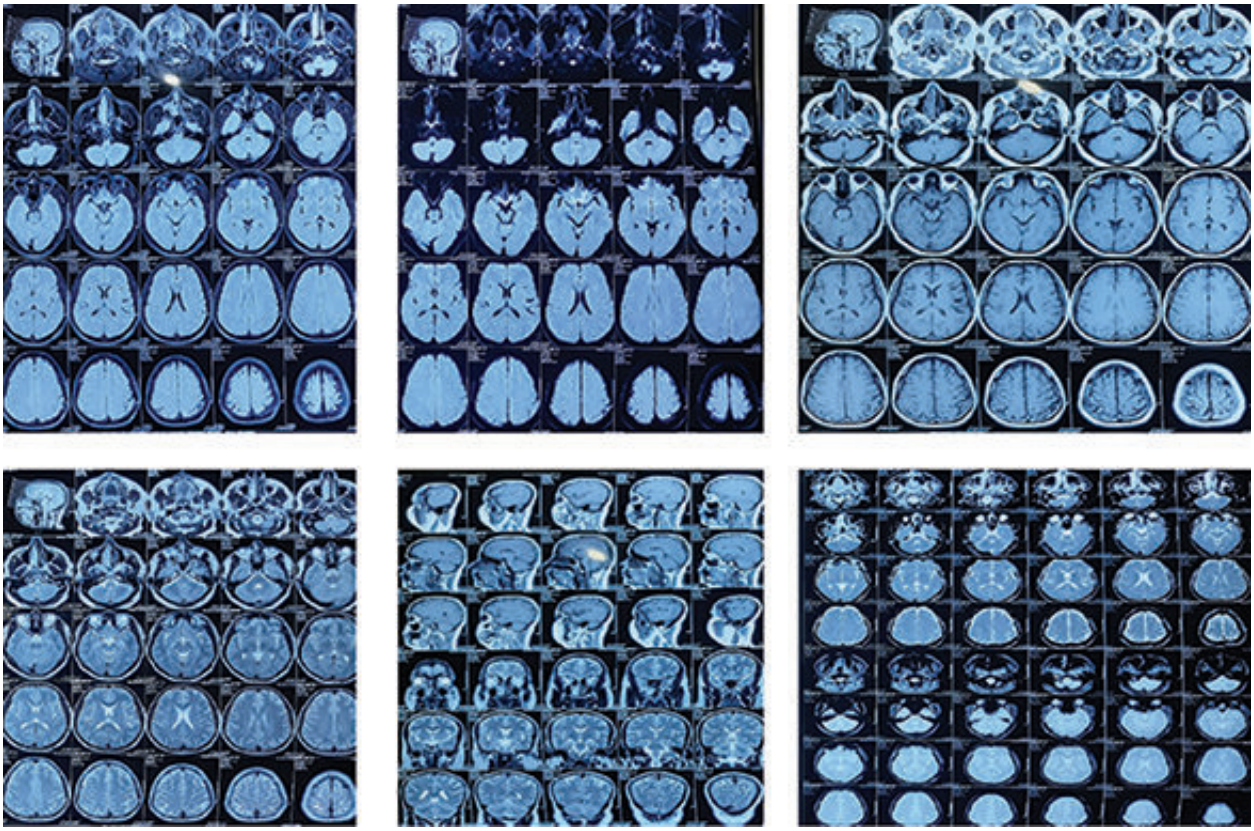

Figure 2: *There are T2/FLAIR hyperintensities involving the bilateral frontal lobes, predominantly along the anteromedial orbital gyri, with extension to the gyrus rectus, especially on the right side. Given the clinical diagnosis of COVID-19 positivity, these MRI findings are suggestive of encephalitis.*

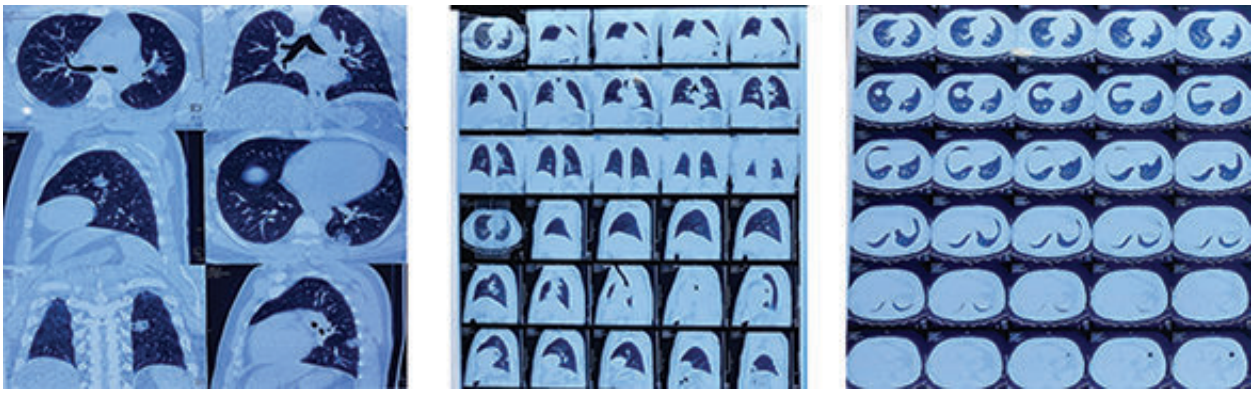

Figure 3: *High Resolution CT Scan of Chest suggestive of Bi lobar consolidation in left lung.*

His investigations included CT scan of Brain, CBC with ESR, S. Creatinine, RBS, HbA1C, S. Electrolyte, SGPT, S. Lipid Profile, ECG, Echo CD, Chest Xray (P/A) showed no abnormality.

During his hospital stay as his headache didn't improve, MRI of brain & MRA of brain and neck vessels were done to exclude any CNS pathology. CSF study wasn't done due to risk of hazards of COVID-19.

The patient was started on anti-viral medications with steroids and anti-convulsants immediately

After 2 days, the patient developed respiratory distress & evidence of hypoxia. His SpO2 was 90% on air.

In order to exclude COVID pneumonia, COVID-19 test and HRCT Chest were done.

RT-PCR for COVID 19: Positive

D-dimer, S. Ferritin was slightly elevated (D-dimer : 0.66, S. Ferritin : 815) & NT pro BNP was within normal limit.

HRCT Chest: Bi-lobar consolidation of left lung

Management of COVID-19 was immediately started and the patient was shifted to COVID-19 ward for better management.

Discussion

A considerable amount of evidence indicates that especially respiratory-related infection is an independent risk factor for acute cerebrovascular disease.[2] Inflammation during acute viral infection can increase the risk of ischemic stroke through changes in blood pressure, coagulation, immune response, and endothelial function. Respiratory infections such as influenza and COVID 19 result in sharp increases of inflammatory markers associated with vascular pathologies.[3] It is worth noting that SARS-CoV-2 RNAaemia is largely restricted to the most severely ill patients with COVID-19 and is not universal even in that setting, pointing towards other mechanisms of thromboembolic disease that might originate in the lungs.[4] Neurological manifestations are now being recognized as sequelae of severe COVID-19 infection. A study of COVID-infected patients in Wuhan, China, found 36.4% of their studied cohort to have neurological symptoms including dizziness, headache, ageusia, anosmia, and stroke.[5] While stroke occurred in 2.8% of the 214 patients reviewed in that study, the incidence of stroke occurred more frequently in patients defined as having severe infection (5.7% vs 0.8%), suggesting that risk of stroke is directly correlated with severity of disease.[5] The spectrum of symptoms described in long COVID has prompted comparisons with myalgic encephalomyelitis or chronic fatigue syndrome (ME/CFS). Indeed, the overlap in symptoms between post-acute COVID-19 syndromes and ME/CFS is remarkable for the shared symptomatology including fatigue, autonomic instability, post-exertional myalgia or weakness as well as neurocognitive impairments.[6] Encephalopathy in COVID-19 has been shown to have various manifestations with ranging severities, characterized by subacute onset and fluctuations or progressive course, eventually reversible.[7] Nonetheless, other viral illnesses (e.g. Dengue, West Nile disease, mononucleosis) are also associated with substantial disabilities that resemble the previous symptom complex. The precise diagnosis and management of neurological symptoms in long COVID is an emerging area of study, which is in evolution as more studies become available. Important caveats in considering persistent or delayed neurological

disorders related to COVID-19 include the contribution of comorbid illnesses and their associated therapies to neurological disease as well as the potential for uncovering previously unrecognized illnesses.[8]

Irrespective of SARS-CoV-2 positivity, the COVID-19 pandemic and the subsequently imposed restrictions had a negative influence on mortality and functional outcomes in stroke patients in general. Higher incidence of mortality and worse functional outcomes at discharge were reported in different cohort studies evaluating stroke patients who were admitted during the COVID-19 pandemic, compared with historical controls of the pre-COVID-19 period.[9-15] These alarming results may be attributable to delays in the presentation of stroke patients and subsequent lower rates of recanalization therapies. Literature describing the characteristic stroke associated with COVID is limited. Despite several cases of young patients including this one who developed large-vessel occlusion, early literature suggests that COVID stroke occurs more commonly in elderly patients with comorbidities including hypertension, diabetes, obesity, and heart disease.[16,17] Additionally, some reports suggest increased stroke incidence in males compared with females.[18,19] This needs to be investigated further. As seen in our patient, COVID patients who developed stroke have had elevated D-dimer, ferritin when compared with stroke patients without COVID.[18,19]

Conclusion

CoV infections can affect the nervous system, and it is currently believed that CoV in concert with host immune mechanisms may turn these infections into persistent infections that may lead to neurological diseases. Therefore, patients with CoV infections should be evaluated early for neurological symptoms, including headache, consciousness disorder, paresthesia, and other pathological signs. Timely analysis of cerebrospinal fluid and awareness and management of infection-related neurological complications are key to improving the prognosis of critically ill patients. In conclusion, COVID-19 may be a risk factor or aggravating factor for stroke.

Conflicts of interest

The authors declare no conflict of interest regarding the publication of this paper.

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