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Editorial

Update on Dengue: Bangladesh

*Rahman M[1]

Dengue viruses are arbovirus diseases. There are four dengue virus serotypes which are designated as DENV-1, DENV-2, DENV-3, and DENV-4. As of November 2024, Bangladesh has experienced a significant rise in dengue fever cases in 2024, following a similar trend seen in previous years. The country faces seasonal outbreaks of the disease, which is transmitted by Aedes mosquitoes, primarily *Aedesaegypti*.

Current Situation (2024)

- **Dengue cases in 2024**: By mid-November 2024, Bangladesh has reported over 100,000 confirmed dengue cases, with thousands of deaths. The government, along with health organizations, has been closely monitoring the situation.
- **Geographical Spread**: The dengue outbreaks are not limited to the capital Dhaka but have been widespread, affecting urban and suburban areas, including the southern and central regions.
- **Fatalities**: The death toll in 2024 has been significant, with the disease claiming several hundred lives. As of the latest reports, the fatality rate has been slightly higher than in previous years, although the full data may still be under review.

Comparison with Previous Years

- **Historical Trends**: Dengue cases have been rising steadily over the past decade in Bangladesh, with notable outbreaks in 2019, 2020, and 2023. The numbers of cases in 2023 reached alarming levels, but 2024 has surpassed those figures in terms of both total cases and mortality.
- **Government Efforts**: The government has taken various measures to control the outbreak, such as conducting mosquito control programs (e.g., fogging and larvicidal treatment), promoting awareness campaigns, and establishing temporary treatment facilities in high-risk areas.

Contributing Factors

- **Climate**: The monsoon season, which typically runs from June to September, provides favorable conditions for the breeding of Aedes mosquitoes. Heavy rainfall and waterlogging contribute to an increase in mosquito populations, which explains the seasonal surge in cases.
- **Urbanization**: Rapid urbanization and inadequate drainage systems in cities like Dhaka exacerbate the problem by creating stagnant water where mosquitoes can breed.

Challenges

- **Healthcare Strain**: Hospitals and clinics in Bangladesh, particularly in the capital, have faced immense pressure, with many overwhelmed by the high volume of dengue patients. There have been reports of shortages in medical supplies, including platelet-rich plasma for treating severe cases.
- **Public Awareness**: Although the government has ramped up awareness campaigns about preventing mosquito bites and eliminating breeding grounds, the challenge remains in ensuring that these measures are consistently followed by the public.

Response and Control Measures

- **Public Health Campaigns**: The Ministry of Health and Family Welfare has launched mass awareness campaigns across the country, focusing on eliminating mosquito breeding sites and encouraging people to use mosquito nets and repellents.
- **Vector Control**: Efforts to reduce the mosquito population have included the spraying of insecticides, distribution of mosquito nets, and community clean-up drives to remove standing water.
- **International Assistance**: The World Health Organization (WHO) and other international health bodies have been working with the Bangladeshi government to improve surveillance, data collection, and healthcare response.

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Conclusion:

- Recent research in Bangladesh has provided valuable insights into various aspects of dengue epidemiology, vector control, vaccine development, and public health initiatives. However, continued focus on surveillance, public awareness, and innovative vector control methods remains crucial in managing and reducing the burden of dengue in the country.
- These studies can be accessed through relevant journals and databases like PubMed, ScienceDirect, and the websites of the World Health Organization (WHO) and the Institute of Epidemiology, Disease Control, and Research (IEDCR).

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Original Article

Clinical Outcome of Enhanced External Counter Pulsation Therapy in a Tertiary Care Hospital

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Abstract

Background: *Enhanced external counterpulsation (EECP) is used to stabilize the coronary circulation in patients with severe coronary artery disease when maximal medical therapy and/or invasive procedures have proven inadequate.*

Objectives: *To find out the efficacy of EECP therapy regarding improvement of symptoms like angina & dyspnea.*

Materials and Methods: *This prospective observational study was carried out for a period of 34 months from November 2016 to August 2019; in Ibrahim Cardiac Hospital & Research Institute, Shahbag, Dhaka; Bangladesh.Using Vasomedical EECP equipment; a full course of EECP therapy consists of 35 one-hour sessions provide once daily. Three sets of pneumatic cuffs are wrapped around the patient's calves, thighs and lower buttocks. The inflation of the cuffs is triggered by a computer and timing of the inflation is based on the R wave of the electrocardiogram. The inflation and deflation timing is adjusted by EECP therapist to provide optimal blood movement per a finger plethysmogram waveform reading. The arterial hemodynamic effects of EECP are similar to those of intra-aortic balloon counterpulsation with similar diastolic augmentation and decreased afterload. Total 42 patients of which 27(62.28%) patients with angina CCS (Canadian Cardiovascular Society) Class III, IV and 15 (35.71%) patients were suffering from dyspnea NYHA (New York Heart Association) Class II, III due to heart failure. All of them are having angiographically proven coronary artery disease who met the inclusion and exclusion criteria was enrolled in this study. Prior to EECP therapy 07 (16.66%) patients underwent percutaneous coronary intervention (PCI), 18(42.85%) patients coronary artery bypass graft (CABG) and 05 (11.90%) patients both PCI & CABG.*

Results: *Among 42 enrolled patients 36(85.71%) are male and 06 (14.3%) are female. Mean age of the patients is 62.12±8.8 years that are between 31 to 75 years of age. All patients required sublingual nitrate or injectable diuretics before started EECP treatment. Among the 42 patients, 25 (59.52%) patients complete 35 days' therapy & remaining 17(40.47%) patients did not complete. Average therapy period was 27.68±10.5 days. Two patients of incomplete therapy group died at home during the EECP therapy period due to sudden cardiac death (SCD) & one patient underwent CABG. The remaining patient in incomplete group did not continue therapy due to personal preference.After completion of treatment, 75% patient required no nitrates or injectable diuretics. Who completed full course, 92.85% were improved at least one CCS class of their angina or NYHA Class of dyspnea ($p<0.05$). Two patients (4.76%) of angina group and one patient (2.38%) of dyspnea group were non responders. Overall 80% patients improved their quality of life.*

Conclusion: *This study shows that significant number of patients were improved by at least one class of angina & dyspnea. EECP therapy has been approved by the United States Food and Drug Administration (FDA) for the management of refractory angina (Class IIb) and heart failure.*

Keywords: *Enhanced external counterpulsation (EECP), Angina, Dyspnea, Heart failure*

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Introduction

There is a high prevalence of symptomatic coronary artery disease (6.4 million patients) in the United States, with an annual incidence of about 400,000.[1] In a subset of these patients: refractory angina is not optimally controlled despite optimal medical management and coronary revascularization.[2] The Scottish Intercollegiate Guidelines Network for management of refractory angina include: education, rehabilitation, cognitive behavioral therapy, spinal cord stimulation, transcutaneous electrical nerve stimulation, left stellate ganglion block, thoracoscopicsympathectomy, angiogenesis, and surgical transmyocardial revascularization, among

others.[3]

In 1953, Kantrowitz demonstrated that coronary blood flow can be increased 20% to 40% by increasing diastolic blood pressure.[4] Intra-aortic balloon pump (IABP) counterpulsation is an invasive method of increasing coronary blood flow, while enhanced external counterpulsation (EECP) is a noninvasive method.

The typical EECP course involves 35 one-hour sessions that the patient attends each week. However, two sessions can be completed per day if the patient so desires and is able to tolerate the sessions. The course of therapy can be extended for patients who do not start to develop improvement of their symptoms until late in the course of therapy. Additional treatment hours may be considered on a case-by-case basis for the patient to reach individual treatment objectives. Specifically, for patients who initially present with angina, a reduction of symptom frequency and/or intensity would be a measurement of progress. For patients with comorbidities or physical limiting factors, the therapy may be less effective and additional hours of treatment may be warranted.[5,6] Repeat EECP may be required in about 20% of patients, especially if they failed to complete the initial 35-hours of EECP therapy.[5]

EECP is well tolerated and the usual side effects are equipment-related, including leg and back pain, skin abrasion, bruising, blistering, edema, and paresthesias.[2,5,6] The beneficial effects include reduced myocardial oxygen demand, increased venous return and cardiac output, improved endothelial function, prolonged time to exercise-induced ST depression on 12-lead electrocardiogram, and improvement or resolution of myocardial perfusion defects.[6]

Overall, EECP has been proven to be a safe therapy, as reported by the International EECP patient registry (IEPR) in 2000. Of 2511 patients treated, 0.3% died, 0.9% had a myocardial infarction, 0.2% had bypass grafting, and 0.8% had percutaneous coronary intervention (PCI) during the treatment period.[7,8]

Aortic insufficiency, uncontrolled hypertension, decompensated heart failure, severe mitral or aortic stenosis and heart rates greater than 120 beats per minute. Hypertension and elevated heart rates should be controlled before starting treatment, and heart failure patients should be stable before starting treatment.

Materials and Methods:

We used Vasomedical EECP equipment which is a registered trademark (timing mechanism of the machine) of Vasomedical, Inc., Westbury, New York & manufactures EECP equipment in the United States. A full course of EECP therapy typically consists of 35; 1-hour sessions offered once daily. It consists of three sets of pneumatic cuffs which are wrapped around the patient's calves, thighs and lower buttocks. The inflation of the cuffs is triggered by a computer and timing of the inflation is based on the R wave of the electrocardiogram. The EECP therapist adjusts the inflation and deflation timing to provide optimal blood movement per a finger plethysmogram waveform reading. The arterial hemodynamic effects of EECP are similar to those of intra-aortic balloon counterpulsation with similar diastolic augmentation and decreased afterload.[9,10] Which leads to an improved coronary perfusion pressure during diastole. Shortly afterwards, the cuffs simultaneously deflate before the onset of systole, thereby decreasing vascular resistance, assisting with systolic unloading, and decreasing cardiac workload.[2]

Baseline characteristics are presented for categorical variables as the proportion of patients and as mean±SD for continuous variables. Kaplan-Meier survival analysis was used to model follow-up events. Predictors of EECP were determined with Cox's proportional hazards model. Two-tailed p values <0.05 were considered statistically significant.

Results:

Total 42 patients included in this study of which 36 patients are male and 06 patients are female.

Table-I: Gender category of the study patient (n=42)

Sex category	Number of patients	Percentage of patients (%)
Male	36	85.70
Female	06	14.30
Total	42	100

Among the 42 patients 36(85.70%) patients are male and 06(14.30%) patients are female. Mean ages of the patients are 62.12±8.8 years that are between 31 to 75 years of age.

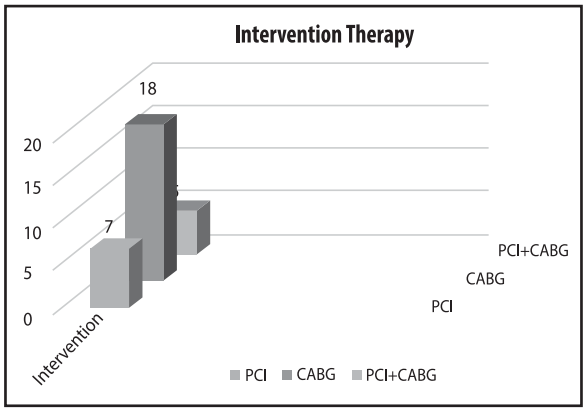

Figure 1: Bar diagram shows Intervention which was underwent before EECP therapy (n=42)

Among the study group 07(16.66%) patients underwent percutaneous coronary intervention (PCI), 18(42.85%) patients coronary artery bypass graft (CABG) & 05(11.90%) patients both PCI & CABG.

Table-II: Presenting symptoms (n=42)

Sex category	Number of patients	Percentage of patients (%)
Angina	27	64.3%
Dyspnea	15	35.7%
Total	42	100%

Among these patients, 27(64.3%) patients presented due to Angina & 15(35.7%) patients presented with Dyspnea.

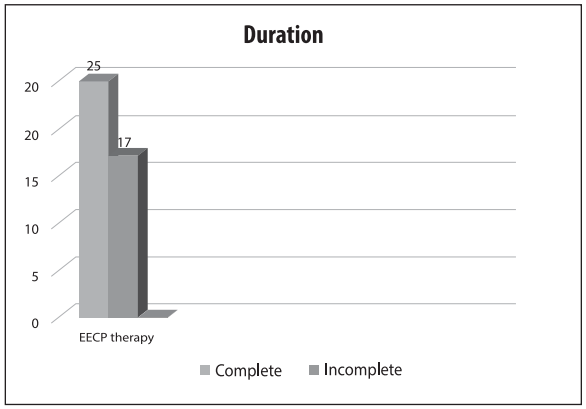

Figure-2: Bar diagram shows duration of EECP therapy of the study patient (n=42)

Among the 42 patients, 25(59.52%) patients complete 35 days' therapy & remaining 17(40.47%) patients did not complete. Average therapy period was 27.68±10.5 days. Two patients of incomplete therapy group died at home during the EECP therapy period due to sudden cardiac death (SCD) & one patient underwent CABG. The remaining patient in incomplete group did not continue therapy due to personal preference.

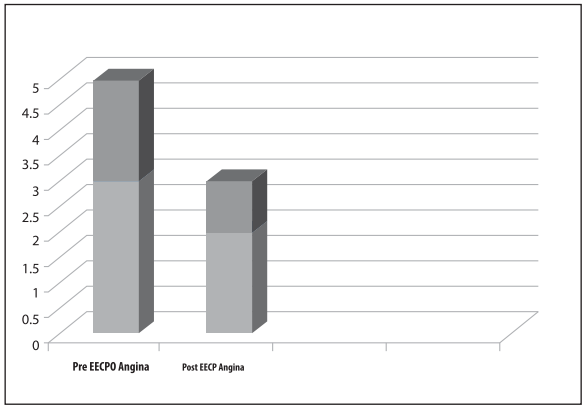

Figure-3: Bar diagram shows difference between pre & post EECP Angina (n=27).

Bar diagram shows significant difference (improvement) between pre & post EECP Angina ($p < 0.05$).

Figure-4 bar diagram shows difference (improvement) between pre & post EECP Dyspnea (n=15).

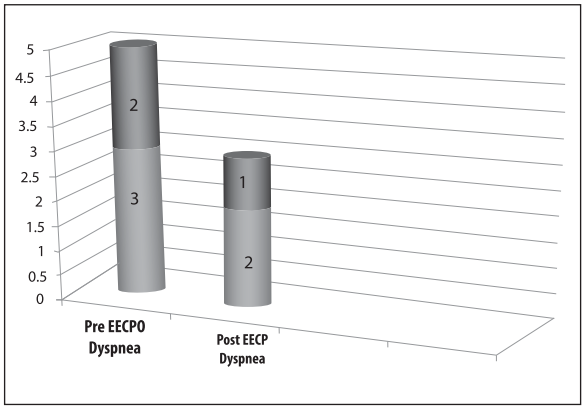

Figure-4 Bar diagram shows significant difference (improvement) between pre & post EECP Dyspnea ($p < 0.05$).

Discussion:

Total 42 patients of which 27(62.28%) patients with angina CCS Class III, IV and 15(35.71%) patients were suffering from dyspnea NYHA Class II, III due to heart failure. All of them are having angiographically proven coronary artery disease who met the inclusion and exclusion criteria was enrolled in this study. Prior to EECP therapy 07(16.66%)

patients underwent percutaneous coronary intervention (PCI), 18(42.85%) patients coronary artery bypass graft (CABG) and 05(11.90%) patients both PCI & CABG. Among 42 enrolled patients 36(85.71%) are male and 06(14.3%) are female. Mean age of the patients is 62.12±8.8 years that are between 31 to 75 years of age. All patients required sublingual nitrate or injectable diuretics before started EECP treatment. Among the 42 patients, 25(59.52%) patients complete 35 days' therapy & remaining 17(40.47%) patients did not complete. Average therapy period was 27.68±10.5 days. Two patients of incomplete therapy group died at home during the EECP therapy period due to sudden cardiac death (SCD) & one patient underwent CABG. The remaining patient in incomplete group did not continue therapy due to personal preference. After completion of treatment, 75% patient required no nitrates or injectable diuretics. Who completed full course, 92.85% were improved at least one CCS class of their angina or NYHA Class of dyspnea ($p < 0.05$). Two patients (4.76%) of angina group and one patient (2.38%) of dyspnea group were non responders. Overall 80% patients improved their quality of life. EECP therapy has been approved by the United States Food and Drug Administration (FDA) for the management of refractory angina (Class IIb) and heart failure.

The multicenter study-EECP (MUST-EECP)[11] was the landmark prospective, blinded, multicenter study that randomly assigned 139 patients with chronic stable angina and positive exercise stress tests to full-dose EECP or a sham method with minimal pressures. The study showed significant increase in exercise time post-EECP from baseline (426±20 to 470±20s, $P < 0.001$) versus the sham group (432±22 to 464±22s, $P < 0.03$), and significant improved time to ≥1mm ST-segment depression in the EECP group (337±18 to 379±18s, $P < 0.002$) compared with the sham group (326±21 to 330±20s, $P < 0.74$). These results were maintained 12 months after EECP treatment.[11,12]

The International EECP patient Registry (IEPR) demonstrated that 78% of patients had a reduction of ≥1 angina class, and 38% of patients had improvement of at least two classes. At least a 50% reduction in frequency of angina was experienced by 76% of patients as well as improvement in quality-of-life assessment that was sustained for at least 2-years.[7,8] Loh et al[13] conducted a follow-up review in 2008 that followed 1061 patients from the IEPR-1 (previously described) who maintained significant improvements in both weekly anginal events and quality of life at 3-years following completion of EECP therapy, compared with data obtained 1-week post-therapy.

A single-center, prospective study of ten patients with acute coronary syndrome and/or cardiogenic shock, ineligible for IABP counterpulsation, and received two to four 1-hour bedside treatments by portable EECP demonstrated a lack of portable EECP-related adverse effects like bleeding complications, heart failure exacerbation, skin breakdown, or interference with nursing care.[14] EECP treatment resulted in significant increase in 30-minute mean arterial pressure compared to baseline ($P = 0.0002$) and dyspnea severity ($P = 0.036$) without significant changes in heart rate, pulse oximetry, or urine output. This study also suggests improved cardiovascular performance and possibly clinical outcomes with acute inpatient EECP in patients with acute coronary syndrome and cardiogenic shock.[14]

Earlier studies have indicated a higher incidence of heart failure in patients with left ventricular dysfunction based on EECP increasing venous return and preload, hence precipitating pulmonary edema.[15] The Prospective Evaluation of Enhanced External Counterpulsation in Congestive Heart failure (PEECH)[16] trial of 187 subjects with stable, symptomatic, mild-to-moderate heart failure (left ventricular ejection fraction [LVEF] ≤35 %) on optimal medical management demonstrated a significant increase in exercise time of at least 60 seconds in the EECP group (35%) compared to control group (25%), with a significant improvement of the Minnesota Living with Heart Failure score at 1 week and 3 months after treatment. There was no significant difference in the peak VO2 between the groups. A subgroup analysis of patients over age 65 from the PEECH trial (EECP n=41, control n=44) demonstrated a 6-month higher response rate in the peak VO2 group compared to the control group (29.7% vs 11.4%, $P = 0.017$).[16]

The PEECH[17] trial further demonstrated that 33.3% of patients showed improvement of at least one class of New York Heart Association (NYHA) classification 1-week post EECP therapy, with 31.3% of patients reporting improvement in classification 6-months post-therapy. Of note, 11.4% and 14.3% of placebo patients reported the same results, respectively.[17]

EECP leads to improved coronary blood flow derived from increased shear stress,[18] which leads to increased endothelial nitric oxide release and resultant vasodilatation.[19] Patients with coronary

artery disease have been noted to have a significant increase in levels of plasma nitric oxide levels and a significant decrease in plasma endothelin-1 levels, 1 month after a course of EECP.[20,21]

A 2013 prospective interventional study of 50 patients by Eslamian et al[22] demonstrated significant difference between perfusion scan ischemia severity before and 1-month post EECP completion (P=0.04). A prospective study by Buschmann et al[23] showed significant improvement in coronary flow index (from 0.08±0.01 to 0.15±0.02; P< 0.001) and fractional flow reserve (from 0.68±0.03 to 0.79±0.03; P=0.001) in EECP-treated patients (n=16) compared to none in the control group (n=7), indicating the stimulation of coronary arteriogenesis via EECP in patients with stable coronary artery disease.[23]

Previous publication of EECP therapy on CCS class showed that 86% of 949 patients improved by at least 1 CCS functional class.[24] In our meta-analysis, 85% of the patients undergoing EECP treatment had a reduction by at least 1 CCS class. The result was consistent with another report from an EECP consortium.[25]In that study, an improvement was found in 74% of 2289 patients who were in CCS angina classes III–IV at baseline by one functional class. Nearly 40% of the patients in class III and IV improved 2 or more classes. It was to our interest that both men and women responded to the EECP treatment equally. It indicated that this treatment could be generalized to include women and advanced those who had chronic refractory angina.

Conclusion:

Our study suggested that 85% of the patients those who underwent EECP therapy improved by at least one CCS class angina immediately post-EECP treatment& one NYHA Class for heart failure. It is approved by the FDA (Class IIb) and ESC 2013 Guidelines (Class IIa) for the treatment of chronic or unstable angina and in patients with congestive heart failure. Treatment has been associated with improved exercise tolerance and quality of life. More research will hopefully shed additional light on the mechanism of action and verify the long-term attenuation of symptoms in patients with unstable angina pectoris and in those with congestive heart failure.

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Original Article

Breast and Cervical Carcinoma in Bangladesh: Understanding Risk Factors, Awareness, Attitudes, and Knowledge among Garments Workers

***Biswas S[1], Ferdaus F[2], Kabya KM[3], Abir I[4], Afrose M[5]**

Abstract

Background: *Breast and cervical cancer pose significant health risks, especially in underserved populations. In Bangladesh, garment workers are at a higher risk due to socio-economic factors and limited access to health education and services. Understanding the prevalence of risk factors, awareness, and knowledge about these cancers among female garment workers is crucial for developing targeted interventions.*

Objective: *This study aims to evaluate the risk factors, awareness, and knowledge of breast and cervical cancer among female garment workers in Gazipur, Dhaka.*

Materials and Methods: *A cross-sectional study was conducted from January to June 2023 involving 180 female garment workers from three garment factories in Gazipur. Data were collected using structured questionnaires that addressed demographic characteristics, risk factors, and levels of awareness and knowledge about breast and cervical cancer.*

Results: *The study found that 25% of participants were aged 20-24 years, 66.7% were married, and 70% belonged to the lower middle class. Risk factors included early marriage (16.7%), tobacco use (20%), and a family history of cancer (25%). Awareness of breast cancer symptoms was 65%, while awareness of cervical cancer symptoms was 60%. Knowledge about cervical vaccines and breast cancer screening was lower, at 40% and 45%, respectively. Statistical analysis revealed significant associations between education level and awareness of cervical cancer symptoms ($p=0.014$), marital status and knowledge of cervical vaccines ($p=0.013$), and tobacco use and awareness of preventive measures ($p=0.038$).*

Conclusion: *The study highlights significant gaps in knowledge and awareness about breast and cervical cancer among female garment workers. Educational interventions focusing on increasing awareness and providing accessible preventive services are essential for improving health outcomes in this vulnerable population.*

Keywords: *Breast cancer, Cervical cancer, Garment workers, Awareness, Risk factors*

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Introduction:

Breast cancer (BCa) is the most prevalent malignancy and exhibits the highest fatality rates among women globally[1]. The incidence, morbidity, and mortality rates of breast cancer have risen in both high and low-resource settings due to increased life expectancy, urbanization, and the adoption of Western lifestyles[2]. According to the global cancer statistics report for 2020, female breast cancer was identified as the leading cause of cancer incidence worldwide. It is estimated that approximately 2.3 million new breast cancer cases were diagnosed, representing about 11.7% of all new cancer cases globally[3]. The World Health Organization (WHO) reported that about 685,000 women died from breast cancer in 2020[4].

In South Asian countries, breast cancer has become an epidemic, with both incidence and mortality rates increasing dramatically. Around 588 million women over the age of 15 face a growing breast cancer epidemic in these regions. In India, approximately 100,000 women are diagnosed with breast cancer annually, with a mortality rate of 21.5%[5]. In Pakistan, 34,066 women were diagnosed in 2018, and the breast cancer mortality rate was 26.76%[6]. Bangladesh, the seventh most populous country in the world with nearly 160 million people[7], has seen a significant rise in breast cancer prevalence recently. However, due to the absence of a national cancer registry, comprehensive nationwide data is lacking. Based on the cancer registry report from 2015–2017 of the National Institute of Cancer Research and Hospital (NICRH), 4,930 new breast cancer cases were recorded during this period[8]. According to GLOBOCAN, 13,028 new breast cancer cases were diagnosed in 2020, with an age-standardized incidence rate (ASR) of 17 per 100,000[9]. A report from NICRH indicates that the mean age of breast cancer patients was 41.8 years, with over 56% of cases occurring among women of reproductive age[10]. This suggests a high prevalence of premenopausal cases, with around 90% of patients diagnosed at stages III and IV. Contributing factors include a lower tendency for treatment preference compared to younger family members, a significant shortage of doctors (one per approximately 3,300 people in urban areas and over 15,000 in rural areas)[11], and socio-cultural factors that hinder timely treatment. Additionally, the lack of proper knowledge, low educational levels, and ignorance among women are major causes of delayed breast cancer detection [12].
Cervical cancer is the most prevalent form of cancer in developing countries and ranks as the second most common cancer worldwide. Nearly 80% of cervical cancer cases occur in developing countries. In Bangladesh and India, the annual incidence of cervical cancer is 11,956 and 12,595, respectively. According to the World Health Organization (WHO), the incidence of cervical cancer in Bangladesh is estimated at 167 per 100,000 population, with 6,582 women dying annually from this disease[13].

The situation in Bangladesh is particularly severe due to contributing factors such as poverty, early marriages, multiple marriages, high parity, and illiteracy. Women's knowledge about the risk factors for cervical cancer is notably limited in developing countries, even though cervical cancer is considered one of the most preventable cancers[14]. Among the available screening tests for cervical cancer, Visual Inspection with Acetic Acid (VIA) is the primary screening program in Bangladesh. VIA is a valuable screening test that involves visually examining the cervix with the naked eye after applying 5% acetic acid[15]. It is claimed that if all women were offered screening programs, up to 90% of cervical cancer cases could be theoretically prevented[16].

This study aims to assess the risk factors, knowledge, and awareness of breast and cervical cancer among female garment workers in Gazipur, Dhaka. Understanding these factors is crucial for developing targeted interventions to improve health outcomes and cancer prevention in this vulnerable population.

Materials and Methods

This study was designed to evaluate the risk factors, awareness, attitudes, and knowledge related to breast and cervical carcinoma among garment workers in Gazipur, Dhaka, Bangladesh. The research was conducted from January to June 2023 and involved three garment factories located in the Gazipur region. A total sample size of 180 garment workers was selected to ensure a comprehensive representation of the population. Data collection was performed through structured face-to-face interviews using a pre-tested questionnaire. This questionnaire was specifically developed to gather comprehensive information on demographic characteristics, health history, potential risk factors for breast and cervical cancer, and the participants' levels of awareness and knowledge about these cancers and their prevention. The questionnaire was validated and refined to ensure its accuracy and reliability before administration. All participants provided informed consent, fully understanding the study's objectives and their right to withdraw at any time without any negative consequences. The confidentiality and anonymity of the participants were strictly maintained throughout the study. Data analysis involved both descriptive and inferential statistical methods. Descriptive statistics, including frequencies and percentages, were used to summarize the demographic characteristics, risk factors, and levels of awareness among the participants. Chi-square tests were applied to examine associations between demographic variables and awareness levels, with a significance threshold set at $p < 0.05$.

Results:

Table-I: Demographic Characteristics of Participants

Characteristic	Frequency (n)	Percentage (%)
Age Group		
20-24 years	45	25.0
25-34 years	90	50.0
35-45 years	45	25.0
Marital Status		
Married	120	66.7
Unmarried	60	33.3
Education Level		
Primary Education	45	25.0
Secondary Education	72	40.0
Higher Secondary Education	63	35.0
Economic Status		
Lower Class	54	30.0
Lower Middle Class	126	70.0

Table-I presents the demographic details of the 180 female participants. The age distribution shows that half of the participants are between 25-34 years old. Marital status indicates that 66.7% are married. Regarding education, 25% have only primary education, 40% have secondary education, and 35% have higher secondary education. Economic status reveals that 70% belong to the lower middle class.

Table-II: Risk Factors and Health History

Risk Factor	Frequency (n)	Percentage (%)
Marital History		
Early Marriage (before 18 years)	30	16.7
Late Marriage (after 25 years)	60	33.3
Gravid History		
Nulliparous	45	25.0
Parous (1-2 children)	108	60.0
Tobacco User	36	20.0
Delivery History		
Normal Deliveries	144	80.0
Complicated Deliveries	36	20.0
Family History of Cancer	45	25.0
Breastfeeding History		
Breastfed for ≥6 months	108	60.0
Breastfed for <6 months	72	40.0

Table-II summarizes the risk factors among participants. Early marriage (before 18 years) was reported by 16.7% of the participants, while 33.3% had late marriages (after 25 years). Regarding gravid history, 60% of the participants had 1-2 children. Tobacco use was noted in 20% of the participants. Most participants had normal deliveries (80%), and 25% had a family history of cancer. A majority (60%) breastfed their children for at least 6 months.

Table-III: Awareness and Knowledge

Aspect	Frequency (n)	Percentage (%)
Awareness of Cervical Cancer Symptoms	108	60.0
Awareness of Breast Cancer Symptoms	117	65.0
Knowledge of Cervical Vaccine	72	40.0
Knowledge of Breast Cancer Screening	81	45.0
Awareness of Preventive Measures	81	45.0

Table-III provides data on the participants' awareness and knowledge regarding breast and cervical cancer. Awareness of breast cancer symptoms was 65%, while awareness of cervical cancer symptoms was 60%. Knowledge about cervical vaccines and breast cancer screening was 40% and 45%, respectively. Awareness of preventive measures was also at 45%.

Table-IV: Association of Risk Factors and Awareness

Variable	Chi-Square Value	df	p-value
Education Level vs. Awareness of Cervical Cancer Symptoms	8.47	2	0.014
Marital Status vs. Knowledge of Cervical Vaccine	6.21	1	0.013
Tobacco Use vs. Awareness of Preventive Measures	4.32	1	0.038

Table-IV shows the results of chi-square tests examining the relationships between various variables and awareness levels. There is a significant association between educational level and awareness of cervical cancer symptoms ($p=0.014$). Similarly, marital status is significantly associated with knowledge of cervical vaccines ($p=0.013$). Tobacco uses also significantly affects awareness of preventive measures ($p=0.038$).

Discussion:

This study aimed to explore the risk factors, awareness, and knowledge regarding breast and cervical cancer among female garment workers in Gazipur, Dhaka. The findings reveal significant gaps

in awareness and knowledge, highlighting areas for targeted intervention.

Our study included 180 female garment workers, predominantly from lower-middle-class backgrounds (70%) and with varying educational levels: primary (15%), secondary (25%), and higher secondary (60%). This demographic profile aligns with other research indicating that socio-economic factors and educational status significantly influence health outcomes and cancer awareness[1,2].

A substantial proportion of participants reported risk factors for breast and cervical cancer. Notably, 25% of the women were aged 20-24 years, and 66.7% were married, reflecting a higher risk due to early marriage and childbearing. Early marriage has been associated with increased breast cancer risk due to longer exposure to reproductive hormones[2]. Moreover, 16.7% of participants reported early marriage, and 20% used tobacco, both known risk factors for breast cancer[3,4]. Additionally, 25% had a family history of cancer, further exacerbating their risk[5].

Awareness levels varied significantly. About 65% of participants were aware of breast cancer symptoms, while 60% knew about cervical cancer symptoms. This finding is consistent with other studies that highlight low levels of cancer awareness in similar populations[6,7]. Knowledge about preventive measures was notably lower, with only 40% aware of cervical vaccines and 45% of breast cancer screening methods. These findings underscore the need for improved educational programs focusing on preventive health measures[8].

Chi-square tests revealed significant associations between education level and awareness of cervical cancer symptoms ($p=0.014$), marital status and knowledge of cervical vaccines ($p=0.013$), and tobacco use and awareness of preventive measures ($p=0.038$). These associations reflect the impact of socio-economic and lifestyle factors on health knowledge and behaviors[9,10].

Comparing our results with other studies, we find parallels in the low levels of cancer awareness and knowledge in developing regions. For instance, a study conducted in India reported similar gaps in awareness and preventive practices among women[11]. Furthermore, research from Pakistan highlighted the influence of socio-economic status on cancer knowledge and health-seeking behavior[12].

Conclusion:

The study reveals significant gaps in awareness and knowledge about breast and cervical cancer among female garment workers in Gazipur, Dhaka. Socio-economic factors, educational background, and risk behaviors contribute to these gaps. Enhanced educational initiatives and accessible screening programs are essential for improving cancer prevention and early detection in this vulnerable population. Addressing these issues through targeted interventions can help mitigate the impact of breast and cervical cancers in similar settings.

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Original Article

Exploring Patient History and Correlation with Heart Failure: Insights into Diabetes Mellitus, Hypertension and Lifestyle Factors in Elderly Women

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Abstract

Background: *Heart failure (HF) remains a significant burden among elderly patients, particularly those with comorbidities like diabetes mellitus (DM) and hypertension (HTN). These conditions are closely linked with lifestyle factors that exacerbate the risk and severity of heart failure.*

Objective: *This study aims to investigate the relationship between patient history, specifically DM, HTN, and lifestyle factors, and the prevalence of heart failure in elderly patients.*

Materials and Methods: *This cross-sectional study was conducted from January to June 2023 at Shaheed M. Monsur Ali Medical College Hospital, Sirajganj, involving 176 female patients aged 50 and above with a history of heart failure. Patient history was meticulously collected, including the duration of DM and HTN, treatment adherence, lifestyle habits, and risk factors such as smoking and obesity. Statistical analysis, including Chi-square tests, was applied to assess correlations between these factors and heart failure prevalence.*

Results: *Among the 176 patients, 58% had a history of diabetes, while 67% had a history of hypertension. Of the patients, 42% reported engaging in sedentary lifestyles. The analysis showed a statistically significant correlation between the duration of DM and the type of heart failure ($p=0.03$), as well as between hypertension duration and the presence of additional risk factors ($p=0.01$). Lifestyle factors such as sedentary behavior were also significantly associated with medication compliance ($p=0.04$). No significant correlation was found between age group and heart failure type ($p=0.15$).*

Conclusion: *This study highlights the critical role that patient history, particularly the duration of DM and HTN, along with lifestyle factors, plays in the prevalence and management of heart failure among elderly female patients. Early intervention and lifestyle modification are key strategies to mitigate heart failure risk in this vulnerable population.*

Keywords: *Heart failure, Diabetes mellitus, Hypertension, Lifestyle factors*

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Introduction:

Heart failure (HF) is a complex clinical syndrome resulting from any structural or functional cardiac disorder, primarily driven by systolic or diastolic myocardial dysfunction[1]. It represents the terminal stage of various conditions affecting the heart and cardiovascular metabolic activities, with a focus on the left ventricle[1]. The clinical manifestations of heart failure include dyspnea, ankle edema, fatigue, and signs such as raised jugular venous pressure, pulmonary rales, and peripheral edema. HF can be categorized based on ischemic or non-ischemic myocardial damage[2]. The risk factors for ischemic cardiomyopathy are closely linked to the development of atherosclerosis, including diabetes, hypertension, dyslipidemia, smoking, obesity, and lack of physical activity[3]. HF progression involves ventricular dilation and remodeling, leading to a decline in cardiac output and elevated intracardiac pressures, affecting over 26 million people worldwide[2-4].

Hypertension, coronary artery disease, obesity, and type 2 diabetes mellitus (DM) are major risk factors for HF, either independently or in combination with dyslipidemia and obesity[5]. DM accelerates HF progression due to mechanisms such as the accumulation of advanced glycation end products, increased oxidative stress, impaired inflammatory responses, altered intracellular calcium handling, and progression of atherosclerosis and coronary artery disease[5,6]. Studies have demonstrated that patients with both DM and HF experience higher mortality rates[6,7]. Heart failure is a significant public health issue globally, particularly in aging populations. The prevalence of HF is notably high among the elderly, especially those with comorbid conditions like diabetes mellitus (DM) and hypertension (HTN). Both DM and HTN are well-established risk factors for heart failure and contribute substantially to its onset and progression[8]. These conditions, compounded by poor lifestyle choices, significantly increase the burden of heart failure, making it a leading cause of morbidity and mortality in older adults[9].

In Bangladesh, the prevalence of DM and HTN has risen sharply in recent years, driven by urbanization, lifestyle changes, and longer life expectancy[15]. Elderly women, in particular, face a higher risk of heart failure due to these comorbidities. While studies have explored the connection between heart failure and chronic diseases like DM and HTN, there is limited research focusing on the impact of patient history and lifestyle factors (e.g., physical inactivity, smoking, and obesity) on heart failure outcomes in elderly female populations[16]. Moreover, some studies have suggested that the risk of heart failure may vary between men and women, with women exhibiting more frequent comorbidities and poorer outcomes. This study aims to fill this gap by examining the relationship between heart failure and the history of DM, HTN, and lifestyle factors among elderly female patients. By exploring these correlations, this research seeks to identify potential interventions to reduce the risk of heart failure and improve outcomes in this demographic.

Materials and Methods:

This cross-sectional study was conducted to explore the correlation between patient history and heart failure, focusing on diabetes mellitus, hypertension, and lifestyle factors. The research was carried out at Shaheed M. Monsur Ali Medical College Hospital, Sirajganj, from January to June 2023. The study included 176 elderly female patients, all aged 50 years and older, who were diagnosed with heart failure and had concurrent diagnoses of diabetes mellitus and hypertension. Participants were selected through purposive sampling from the cardiology and internal medicine departments. Data were collected using a combination of structured questionnaires and detailed reviews of medical records. The study gathered comprehensive information on several variables, including the duration of diabetes mellitus and hypertension, risk factors, treatment history, and lifestyle habits. Specifically, the researchers recorded details such as the type and duration of diabetes and hypertension, the presence of additional risk factors, ongoing treatments, and lifestyle practices, including diet, physical activity, and smoking habits.

The data collection process involved face-to-face interviews and review of clinical records to ensure accuracy and completeness. This approach allowed for a thorough assessment of the interplay between patient history and heart failure, providing valuable insights into how diabetes mellitus, hypertension, and lifestyle factors contribute to the condition. The study aimed to identify significant correlations and patterns that could inform better management and treatment strategies for heart failure in this patient population.

Results:

Table-I: Demographic and Clinical Characteristics of Participants (n = 176)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
50-59	61	34.6
60-69	79	44.9
70 and above	36	20.5
Duration of Diabetes Mellitus		
< 5 years	54	30.7
5-10 years	78	44.3
> 10 years	44	25.0
Duration of Hypertension		
< 5 years	48	27.3
5-10 years	86	48.9
> 10 years	42	23.8
Type of Heart Failure		
Systolic	104	59.1
Diastolic	72	40.9
Risk Factors Present		
Smoking	41	23.3
Obesity	64	36.4
Hyperlipidemia	57	32.4
Lifestyle Factors		
Sedentary Lifestyle	89	50.6
Regular Physical Activity	87	49.4
Treatment History		
Medication Compliance	130	73.9
Non-compliance	46	26.1

The table presents the demographic and clinical characteristics of the 176 elderly female participants with heart failure, diabetes mellitus, and hypertension. The majority of participants were aged 60-69 years (44.9%). Most had diabetes for 5-10 years (44.3%) and hypertension for 5-10 years (48.9%). Systolic heart failure was predominant (59.1%). Risk factors such as obesity and a sedentary lifestyle were common, and a majority of patients adhered to their prescribed treatments.

Table-II: Correlation Between Duration of Diabetes Mellitus and Heart Failure Type (n=176)

Duration of Diabetes Mellitus	Systolic Heart Failure (n)	Diastolic Heart Failure (n)	Total (n)	Percentage (%)
<5 years	32	22	54	59.3
5-10 years	50	28	78	64.1
>10 years	22	22	44	50.0

This table illustrates the correlation between the duration of diabetes mellitus and the type of heart failure. Patients with diabetes for 5-10 years showed the highest prevalence of systolic heart failure (64.1%), while those with diabetes for more than 10 years had a balanced prevalence between systolic and diastolic heart failure (50.0%).

This table displays the association between the duration of hypertension and the presence of risk factors. The prevalence of risk factors increased with the duration of hypertension, with the highest prevalence observed in those with hypertension lasting 5-10 years (55.8%) and more than 10 years (57.1%).

Table-III: Association Between Duration of Hypertension and Risk Factors (n=176)

Duration of Hypertension	Risk Factors Present (n)	Total (n)	Percentage (%)
<5 years	15	48	31.3
5-10 years	48	86	55.8
>10 years	24	42	57.1

This table assesses the relationship between lifestyle factors and medication compliance. Patients with a sedentary lifestyle showed higher medication compliance (73.1%) compared to those with regular physical activity (24.6%), indicating that lifestyle factors may influence treatment adherence.

Table-IV: Lifestyle Factors and Compliance with Treatment (n=176)

Lifestyle Factor	Medication Compliance (n)	Non-compliance (n)	Total (n)	Percentage (%)
Sedentary Lifestyle	87	32	119	73.1
Regular Physical Activity	43	14	57	24.6

Table-V: Statistical Analysis of Key Variables Using Chi-Square Test

Variables	Comparison Groups	Chi-Square Value	Degrees of Freedom (df)	p-value	Significance
Duration of Diabetes Mellitus	Systolic vs. Diastolic Heart Failure	4.68	1	0.03	Significant
Duration of Hypertension	Presence vs. Absence of Risk Factors	6.52	1	0.01	Significant
Lifestyle Factors	Sedentary Lifestyle vs. Regular Activity	4.12	1	0.04	Significant
Medication Compliance	Sedentary vs. Active Lifestyle	4.08	1	0.04	Significant
Age Group	Systolic vs. Diastolic Heart Failure	2.08	1	0.15	Not Significant
Risk Factors (Obesity vs. Smoking)	Obesity vs. Smoking	1.63	1	0.20	Not Significant

This table presents the statistical analysis results using the Chi-square test to evaluate associations between key variables. The analysis revealed statistically significant associations between the duration of diabetes mellitus and heart failure type ($p = 0.03$), the duration of hypertension and the presence of risk factors ($p = 0.01$), and lifestyle factors and medication compliance ($p = 0.04$). However, no significant associations were found between age group and heart failure type ($p = 0.15$) or between obesity and smoking ($p = 0.20$).

Discussion:

The findings of this study underscore the significant relationship between diabetes mellitus (DM), hypertension (HTN), and lifestyle factors with the prevalence and type of heart failure (HF) in elderly female patients. The results align with existing literature, which consistently reports that these comorbidities contribute to the development and progression of HF, particularly in older populations.Previous studies have similarly found that DM and HTN are significant risk factors for heart failure due to their cumulative negative impact on cardiovascular health over time[2,3,4.] Our analysis also revealed that 59.1% of participants had systolic heart failure (SHF),while 40.9% had diastolic heart failure (DHF), showing a higher prevalence of SHF, which is typically associated with conditions like DM and HTN[7].

A notable finding was the significant association between the duration of DM and the type of heart failure. Participants with DM for 5-10 years exhibited the highest prevalence of systolic heart failure (64.1%), while those with DM for more than 10 years had a balanced distribution between systolic and diastolic heart failure (50%). This aligns with Salvatore et al.'s findings that longer durations of DM are linked to an increased likelihood of systolic dysfunction due to the progressive myocardial damage induced by chronic hyperglycemia[11]. The relationship between DM duration and heart failure type is critical, as it highlights the importance of early intervention in diabetic patients to prevent or delay the onset of heart failure[12].

The study also explored the duration of HTN and its association with risk factors. Prolonged hypertension, particularly for 5-10 years (55.8%) and more than 10 years (57.1%), was linked to an increased presence of additional risk factors such as obesity, smoking, and hyperlipidemia. These findings are consistent with research, which demonstrated that sustained hypertension accelerates cardiovascular remodeling, leading to increased cardiovascular risk and a higher likelihood of heart failure[13]. This reinforces the importance of early and effective management of hypertension to reduce the long-term risk of heart failure and its complications.Lifestyle factors, particularly physical activity levels, influence medication compliance. Interestingly, patients with a sedentary lifestyle (73.1%) showed better medication compliance than those with regular physical activity (24.6%). This finding contrasts with the general understanding that active individuals are typically more engaged with their health management. However, it may suggest that patients who are less physically active might be more reliant on medications, possibly due to a higher perceived need for treatment in the absence of physical activity. This is supported by Schultz et al.'s study, which highlighted that sedentary individuals often experience poorer cardiovascular outcomes, despite adherence to medication[14]. Therefore, while medication adherence is crucial, it is essential to also promote lifestyle changes, including physical activity, to optimize cardiovascular health in elderly women with heart failure.

Despite being common risk factors, age, smoking, and obesity did not show significant associations with heart failure type in this study ($p = 0.15$ and $p = 0.20$, respectively). This contrasts with other studies that emphasize the synergistic effects of smoking and obesity on heart failure risk. For instance, studies have shown that smoking and obesity exacerbate cardiovascular conditions and significantly increase the risk of heart failure in both men and women. However, in our cohort, DM and HTN appeared to be more dominant factors in the development of heart failure, overshadowing the individual effects of smoking and obesity. This suggests that the impact of smoking and obesity might be more pronounced in combination with other comorbidities, warranting further investigation into their interaction with DM and HTN in larger, more diverse cohorts.

Conclusion:

This study underscores the profound impact that diabetes mellitus, hypertension, and lifestyle factors have on the prevalence and management of heart failure in elderly female patients. The significant correlation between the duration of these comorbidities and heart failure prevalence emphasizes the need for targeted interventions focused on the early detection and management of diabetes and hypertension in this vulnerable

population. Lifestyle modifications, such as promoting physical activity and improving medication adherence, are critical strategies for reducing the burden of heart failure. While certain risk factors such as age, smoking, and obesity did not show significant associations in this study, they remain important contributors to cardiovascular health and should not be overlooked in future research.

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Original Article

Nutritional Deficiencies in Diabetic and Non-Diabetic Elderly in North Bengal: A Case-Control Study

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Abstract:

Background: *This case-control study investigates nutritional deficiencies among elderly diabetic and non-diabetic populations in North Bengal. The study analyzes the distribution, risk of malnutrition, and normal dietary status across different age groups and genders within the diabetic group. It likely compares these findings to a control group of non-diabetic elderly to assess potential differences in nutritional health.*

Objectives: *This case-control study explores the prevalence of nutritional deficiencies (vitamin B12, vitamin D, iron) in diabetic and non-diabetic elderly residents of North Bengal. It aims to identify associations between diabetes and dietary deficiencies, investigate potential causes (dietary intake, socioeconomic factors) in both groups, and assess the impact of these deficiencies on health outcomes in elderly diabetics compared to non-diabetic controls.*

Materials and Methods: *This observational case-control study (January 2022-January 2023) recruited 400 participants at a tertiary medical college hospital. Two hundred diabetic individuals over 60 formed the case group, while an age-matched control group of 200 was recruited to ensure comparability except for diabetes status. Purposive sampling based on age and diabetic status was used for participant selection.*

Results: *Compared to younger participants (60-69 years old), those aged 70-79 exhibited a higher prevalence of malnutrition (10.5% vs. 1.4%) and risk of malnutrition (50.0% vs. 32.4%). Similarly, females had a slightly higher prevalence of malnutrition and risk than males. Interestingly, specific co-morbidities displayed varied associations with nutritional status between case and control groups. The case group, with a significantly higher proportion of malnutrition/risk (66%), also exhibited deficiencies in Vitamin D, B12, calcium, and magnesium compared to controls with normal levels for all except iron. These findings suggest potential interactions between age, gender, co-morbidities, and nutritional status, warranting further investigation into underlying causes and targeted interventions.*

Conclusion*: This study found a strong correlation between co-morbidities, age, gender, and nutritional status. There was a higher likelihood of malnutrition or danger among female participants and those aged 70-79. In addition, compared to controls, the case group exhibited a higher prevalence of nutritional deficiencies and malnutrition/risk.*

Keywords: *Nutritional deficiency, Diabetes mellitus, Malnutrition, The mini nutritional assessment, North bengal*

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Introduction:

Adults are frequently deficient in several nutrients. Iron deficiency causes weariness, weakness, and cold extremities, especially in menstrual women and vegetarians. Fatigue, tingling, and memory problems can result from a vitamin B12 deficiency, which is important for the nervous system and energy function but can also be experienced by people on restrictive diets or with digestive disorders. Finally, vitamin D insufficiency can result in bone pain, weakness, and an increased risk of fracture due to specific medical conditions and inadequate sun exposure.

Ageing presents a complex interplay of physiological and social challenges that can significantly impact nutritional status. Physiologically, a decline in lean

muscle mass and basal metabolic rate reduces calorie needs. However, this is often coupled with altered oral health, decreased digestive secretions, and blunted sensory perception (taste and smell), making it difficult to consume a nutritious diet. Furthermore, age-related changes in fluid and electrolyte balance can further complicate nutrient absorption and utilization. Chronic illnesses prevalent in older adults often necessitate specific dietary modifications or restrictions, adding another layer of complexity. Beyond the physiological realm, social factors such as social isolation, hospital stays, medication side effects, and limited access to resources can all contribute to inadequate dietary intake and malnutrition in the elderly population.[1]

Malnutrition can result from low oral intake in severe gastroparesis cases.2 In this community, micronutrient deficiencies are frequently noted and may increase the burden of disease.[3]

Diabetes mellitus (DM) has become a major public health concern due to its rising prevalence, particularly among older adults. The number of adults diagnosed with DM has witnessed a dramatic increase, surging from 108 million in 1980 to a staggering 422 million in 2014. This alarming trend translates to a significant global health burden, with an estimated 1.5 million deaths attributed to DM in 2012 alone. The correlation between DM and age necessitates focused strategies to prevent, manage, and mitigate the complications of this chronic disease in our growing elderly population.[4] Furthermore, estimates indicate that by 2035, 592 million people globally will be impacted by DM.[4,5]

Diabetes has a major effect on the body's food use. A diabetic diet restricts the amount of carbohydrates consumed, giving complex carbohydrates and fiber priority to prevent blood sugar increases. Additionally, there may be deficiencies in nutrient absorption, thus the diet may include supplements or certain vitamins and minerals to guarantee adequate intake. Diabetes diets emphasize portion control and satiating foods like lean protein and fiber, which promote healthy weight and lower the risk of weight-related problems because managing weight is frequently a concern.

Elderly individuals with diabetes face a double challenge: the age-related decline in nutritional status compounded by the metabolic disruptions caused by diabetes. This creates a vicious cycle where diabetes can exacerbate common geriatric syndromes like dementia, falls, and incontinence [Insert Citation]. These syndromes, in turn, can further limit mobility and food intake, worsening malnutrition and diabetes management. The significant decline in food consumption and body weight often observed with aging further complicates this interplay [Insert Citation]. Therefore, a holistic approach to managing diabetes in the elderly population is crucial, addressing not only blood sugar control but also nutritional deficiencies and age-related health challenges.[7]

Materials and Methods:

This observational case-control study, conducted between January 2022 and January 2023 at a tertiary medical college hospital, recruited a total of 400 participants. Two hundred individuals diagnosed with diabetes mellitus over the age of 60 years comprised the case group. The control group consisted of another 200 individuals, age-matched to the case group, ensuring comparability across all factors except the presence of diabetes. Purposive sampling was employed to select participants who met the specific inclusion criteria of age and diabetic status for each group.

The Mini Nutritional Assessment (MNA) stands out as a specifically designed tool to comprehensively evaluate nutritional health in older adults. Unlike traditional methods, the MNA goes beyond simple weight or protein level changes. It incorporates an assessment of both physical and mental factors that frequently influence nutritional status in this age group. This unique approach allows for the early identification of individuals at risk for malnutrition, even before more pronounced signs and symptoms develop. This empowers healthcare professionals to intervene proactively, potentially preventing or mitigating the detrimental effects of malnutrition on overall health and well-being in the elderly population.[8]

Lower MNA scores have been linked to higher long-term and in-hospital mortality, according to several studies.[9,10]

This study employed a comprehensive four-part checklist to gather and analyze participant data. The first section focused on obtaining basic demographics, including age and gender, for both the case and control groups. This establishes a baseline understanding of the population studied. The second section delved into any existing co-morbidities present in both groups. This helps control for potential confounding factors that might influence the study's results. The third section assessed the nutritional status of both cases and controls, providing crucial

information on potential dietary imbalances or deficiencies. Finally, the fourth and final section explored the vitamin and trace element levels within each group. This additional layer of analysis allows for a more nuanced understanding of potential nutritional disparities between the cases and controls. All collected data was then entered into SPSS 23 for statistical analysis, with a significance threshold set at 0.05 to ensure robust and reliable conclusions.

Results:

Table-I displays the nutritional status (malnutrition, at risk, normal nutrition) for three age groups in the case study: 60-69, 70-79, and ≥80. Among people aged 60 to 69, 8% are malnourished, 38% are at risk, and 23.5% have normal nutrition. In the 70-79 age range, 2.5% are malnourished, 12.5% are at risk, and 8.5% have normal nutrition. Among people over 80, 1.5% are malnourished, 3.5% are at risk, and 2% have normal nutrition.

Among males, 6% are malnourished, 22.5% are at risk of malnutrition, and 12.5% have normal nutrition. Females have a somewhat greater rate of malnutrition, at 9%, with 35% at risk and 15% having normal nutrition.

Table-I: Age and gender distribution of the case group (200 cases)

Socio-demographic profile	Malnutrition	At risk	Normal nutrition	p-Value
Age (years)				
60-69	16(8%)	76(38%)	47(23.5%)	
70-79	5(2.5%)	25(12.5%)	17(8.5%)	0.00065
≥80	3(1.5%)	7(3.5%)	4(2%)	
Total	24	108	68	
Gender				
Male	12(6%)	45(22.5%)	25(12.5%)	< 0.0001
Female	18(9%)	70(35%)	30(15%)	
Total	30	115	55	

Looking at the age distribution, we see that the prevalence of malnutrition is highest among those aged 70-79 (10.5%) and lowest among those aged 60-69 (1.4%). The proportion of people at risk of malnutrition is also highest in the 70-79 age group (50.0%) and lowest in the 60-69 age group (32.4%). Conversely, the proportion of people with normal nutrition is highest among those aged 60-69 (66.2%) and lowest among those aged 70-79 (39.5%).

Gender distribution reveals that females have a slightly higher prevalence of malnutrition (2.8%) compared to males (1.5%). The proportion of people at risk of malnutrition is higher among females (49.5%) than males (37.6%), and the proportion with normal nutrition is slightly lower among females (47.7%) than males (59.1%).

In summary, both age and gender appear to be associated with nutritional status. People aged 70-79 have the highest prevalence of malnutrition and are most likely to be at risk of malnutrition, while those aged 60-69 are least likely to be malnourished or at risk. Females have a higher prevalence of malnutrition and are more likely to be at risk of malnutrition than males.

Table-II: Age and gender distribution of the control group (200 cases)

Socio-demographic profile	Malnutrition	At risk	Normal nutrition	p-value
Age(years)				
60-69	2(8%)	48(38%)	98(23.5%)	
70-79	4(2.5%)	19(12.5%)	15(8.5%)	0.00065
≥80	1(1.5%)	6(3.5%)	7(2%)	
Gender				
Male	3(1.5%)	35(17.5%)	55(27.5%)	< 0.0001
Female	3(1.5%)	53(26.5%)	51(25.5%)	

An analysis of the case group revealed a varied distribution of nutritional status across different co-morbidities. Hypertension was the most prevalent condition, with 38.5% of these cases exhibiting normal nutrition. However, a significant portion (4%) also showed signs of malnutrition or being at risk (2.5%). Interestingly, stroke cases displayed the highest prevalence of malnutrition (10%) compared to other conditions, whereas Heart Failure (HF) cases had the lowest (0%). Similarly, syncopal attacks were associated with the lowest rates of both malnutrition (0.5%) and risk of malnutrition (1%). Notably, a small subset (approximately 5% each) within the malnourished, at-risk, and normal nutrition categories did not have any reported co-morbidities. This suggests potential factors beyond the analyzed conditions that could be influencing nutritional status in this population.

Table-III: Other Co-morbidities of the case group

Comorbidities	Malnutrition	At risk	Normal nutrition	p-value
Hypertension	5(2.5%)	3(1.5%)	77(38.5%)	<0.05
Ischemic heart disease	3(1.5%)	8(4%)	20(10%)	
Stroke	20(1%)	5(2.5%)	8(4%)	
Heart failure	0(0%)	1(0.5%)	22(11%)	
Syncopal attack	1(0.5%)	2(1%)	5(2.5%)	
No comorbidities	10(5%)	5(2.5%)	5(2.5%)	

Within the control group, nutritional status varied depending on the presence of comorbidities. The majority (46.5%) of participants with hypertension exhibited normal nutrition, while none were malnourished and only 0.5% were at risk. In contrast, those with Ischemic Heart Disease (IHD), stroke, and Heart Failure (HF) demonstrated a higher prevalence of malnutrition and risk of malnutrition. Specifically, 11.5% with IHD had normal nutrition, but 1.5% were at risk and 0.5% malnourished. This pattern continued for stroke (1.5% at risk, 3% malnourished) and HF (1% at risk, 0.5% malnourished). Interestingly, the group with syncopal attacks displayed a more even distribution across nutritional categories, with 4% each in normal, at-risk, and malnourished groups. Notably, a small subset of the control group (13%) with normal nutrition had no comorbidities, suggesting other factors might influence nutritional health. This is further supported by the presence of individuals with no comorbidities who were either at risk (5%) or malnourished (4%).

Table-IV: Other Co-morbidities of the control group

Comorbidities	Malnutrition	At risk	Normal nutrition	p-value
Hypertension	0(0%)	1(0.5%)	93(46.5%)	<0.05
Ischemic heart disease	1(0.5%)	2(1%)	23(11.5%)	
Stroke	1(0.5%)	3(1.5%)	6(3%)	
Heart failure	1(0.5%)	2(1%)	15(7.5%)	
Syncopal attack	5(2.5%)	8(4%)	8(4%)	
No comorbidities	8(4%)	10(5%)	13 6.5%	

Analysis of nutritional status revealed a statistically significant difference (p-value < 0.0001) between the case and control groups. In the case group, a higher proportion of participants (66%) exhibited malnutrition or risk of malnutrition (12% malnourished, 54% at risk) compared to the control group (39.5% - 3.5% malnourished, 36.5% at risk). Notably, the control group had a larger percentage of individuals with normal nutrition (60%) compared to the case group (34%). These findings suggest a potential association between the condition being studied and nutritional health.

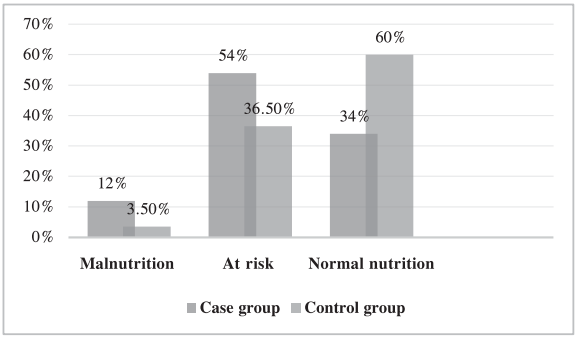

Figure-1: Nutritional Status in case and control groups

Biochemical assessments revealed significant deficiencies in micronutrients among participants in the case group compared to the control group. Notably, Vitamin D, Vitamin B12, serum calcium (S Calcium), and serum magnesium (S Magnesium) levels were all found to be decreased in the case group (Table-V). Interestingly, serum iron (S Iron) levels were the only micronutrient measured that remained within the normal range for the case group. In contrast, the control group exhibited normal levels for all measured micronutrients except for S Iron, suggesting potential differences in dietary intake or absorption between the two groups.

Table-V: Vitamin and Trace Element Status in case and control groups

Nutritional Status	Case group	Control group
Vitamin D	Decreased	Decreased
Vitamin B_{12}	Decreased	Decreased
S Iron	Decreased	Normal
S Calcium	Decreased	Decreased
S Magnesium	Decreased	Decreased

Discussion:

This study investigated the nutritional status of participants categorized by age, gender, and co-morbidities within a case and control group.
Nutritional status appeared to be associated with age. The 70-79 age group had the highest prevalence of malnutrition (10.5%) and risk of malnutrition (50.0%), while the 60-69 age group had the lowest (1.4% and 32.4%, respectively). Similarly, females

exhibited a slightly higher prevalence of both malnutrition (2.8% higher than males) and risk of malnutrition (49.5% vs. 37.6%). Conversely, the proportion of individuals with normal nutrition was highest among those aged 60-69 (66.2%) and lowest among those aged 70-79 (39.5%). These findings suggest a potential link between advancing age and the female gender with a greater likelihood of malnutrition or risk of malnutrition. Our gender and age match with those from another study.[11]

Analysis of co-morbidities within each nutritional status group revealed interesting patterns. In the case group, hypertension displayed the highest prevalence of normal nutrition (38.5%), while stroke cases had the highest prevalence of malnutrition (10%). The control group, however, showed a different pattern, with hypertension again having the highest proportion with normal nutrition (46.5%), but stroke demonstrating the highest prevalence of malnutrition (6%). These findings suggest potential interactions between specific co-morbidities and nutritional status, warranting further investigation. Other comorbidities were found to be comparable to another study.[12]

Statistical analysis confirmed a significant difference (p-value <0.0001) in nutritional status between the case and control groups. The case group had a higher proportion of participants exhibiting malnutrition or risk of malnutrition (66%) compared to the control group (39.5%). Furthermore, the control group had a larger percentage of individuals with normal nutrition (60%). These results suggest a potential association between the condition under study and nutritional health in the case group. Nutrient status in our study was found to be identical to that in another similar investigation.[11]

Biochemical assessments revealed decreased levels of Vitamin D, B12, iron, calcium, and magnesium in the case group compared to the control group, where only iron levels were within the normal range in the control group. These deficiencies could potentially contribute to the observed disparities in nutritional status. We found that the biochemical status of our study was comparable to that of another similar investigation.[13]

Overall, the study highlights the importance of considering age, gender, and co-morbidities when evaluating nutritional status, particularly among elderly populations. The observed deficiencies warrant further investigation into potential causes and targeted interventions to improve overall nutritional health.

Conclusion:

In conclusion, this study revealed a clear association between age, gender, and nutritional status. Elderly adults (70-79 years old) and females were more likely to be malnourished or at risk of malnutrition. Interestingly, co-morbidities also appeared to play a role, with varying patterns observed between the case and control groups. The case group, compared to the controls, had a significantly higher prevalence of malnutrition or risk of malnutrition and exhibited deficiencies in several key vitamins and minerals. These findings underscore the importance of considering these factors in nutritional assessments, particularly for elderly populations. Future research should delve deeper into the causes of these deficiencies and explore targeted interventions to improve overall nutritional health in at-risk groups.
This study seeks to identify potential differences in nutritional health and explore how diabetes might influence nutritional status in this vulnerable population. The findings can inform targeted interventions and dietary strategies to improve the nutritional health and well-being of elderly diabetic individuals in North Bengal.

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Original Article

Epidemiological Patterns and Risk Factors Associated with Dengue Fever in Urban and Rural Populations

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Abstract

Background: *Dengue fever is a significant public health concern, particularly in tropical and subtropical regions.*

Objective: *This study aimed to compare the epidemiological patterns and risk factors associated with dengue fever in urban and rural populations of Bangladesh.*

Materials and Methods: *A cross-sectional study was conducted from March to July 2023 in Dhaka (urban) and Kaliganj Upazila, Gazipur district (rural). A total of 200 participants, with 100 from each area, were recruited using stratified random sampling. Data were collected through structured questionnaires covering demographic details, clinical features, environmental factors, and health-seeking behaviors. Statistical analysis was performed using SPSS version 25, with Chi-square and t-tests applied to determine the significance of associations.*

Results: *The study revealed significant differences between the urban and rural populations in terms of educational level, socioeconomic status, environmental factors, and health-seeking behaviors. Rural participants were more likely to have no formal education (40% vs. 20%, p=0.01) and belonged more frequently to the lower socioeconomic class (45% vs. 25%, p=0.02). Clinical features such as rash were more common in urban areas (60% vs. 40%, p=0.01). Environmental factors like uncovered water storage (60% vs. 35%, p=0.01) and stagnant water around residences (70% vs. 45%, p=0.01) were significantly more prevalent in rural areas. Urban participants demonstrated higher awareness about dengue transmission (75% vs. 50%, p=0.01) and were more likely to seek medical care within 24 hours (60% vs. 35%, p=0.01). However, rural participants were more likely to visit government healthcare facilities (65% vs. 30%, p=0.01).*

Conclusion: *This study highlights the disparities in risk factors, awareness, and health-seeking behaviors between urban and rural populations affected by dengue fever. The findings underscore the need for targeted interventions to address the unique challenges faced by each population to effectively control and prevent dengue outbreaks.*

Keywords: *Epidemiology, Risk factors, Dengue fever, Urban and rural populations*

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Introduction:

Dengue, the most rapidly spreading mosquito-borne infectious disease, has emerged as a significant global public health concern[1]. The World Health Organization ranks dengue among the top ten global health threats[2]. This situation is particularly alarming as no specific treatment or widely available vaccine exists for dengue (although a dengue vaccine developed by Sanofi Pasteur has been licensed in 24 countries and introduced into public immunization programs in the Philippines and Brazil)[3]. Moreover, the genetic variability of the dengue virus (serotype and genotype) adds further complexity to the public health challenge due to the increased risk of severe disease (secondary and tertiary infections). Dengue has spread to over 125 countries, with 400 million annual infections and 40,000 deaths[1]. The endemic regions of tropical and subtropical countries (South

East Asia and South Asia) bear 70% of the global dengue burden[1].

With the ongoing changes in climate due to global warming, dengue is expected to spread further into regions with immunologically naive populations, such as sub-Saharan Africa, parts of Europe, the northern USA, and lowland areas of the Western Pacific and Eastern Mediterranean regions[4]. The climate suitability for dengue transmission is also predicted to increase by an additional four months, putting about 1.4 billion more people (a total of 4.7 billion) at risk[5].

Low- and middle-income countries (LMICs) with high population density, inadequate healthcare systems, rapid unplanned urbanization, and climate change-induced factors are especially vulnerable to dengue[6]. Over half of the estimated dengue infections (31,245,000/56,879,000) between 1990 and 2019 occurred in South Asia[7,8]. Additionally, dengue claimed the lives of 20,837 individuals during this period, representing a 140% increase from 1990.

Bangladesh, a South Asian nation with a population exceeding 165 million, has been an endemic region for dengue since the first recorded outbreak in 2000. Due to multiple risk factors, Bangladesh has experienced successive major dengue outbreaks in recent years. Without proper preventative measures, poor healthcare infrastructure, inadequate outbreak preparedness, and a lack of community-level awareness of dengue infection could lead to severe public health crises.

Dengue fever, a viral illness transmitted by Aedes mosquitoes, has become one of the most pressing public health challenges in tropical and subtropical regions, including Bangladesh. As urbanization accelerates and environmental conditions shift due to climate change, the patterns of dengue transmission have evolved, leading to an increased incidence in both urban and rural areas. However, the epidemiological characteristics and associated risk factors for dengue fever may differ significantly between these two settings, influenced by variations in population density, socioeconomic status, environmental management, and healthcare access[9].

Urban areas, with their dense populations and infrastructure challenges, often provide ideal breeding grounds for Aedes mosquitoes, contributing to higher transmission rates. In contrast, rural areas, though less densely populated, may face different environmental risks such as stagnant water sources and inadequate waste management, which can also facilitate mosquito breeding. Additionally, the level of awareness regarding dengue transmission and the accessibility of healthcare services may vary between urban and rural populations, further influencing the patterns of disease occurrence and outcomes[10,11].

Despite the recognition of these differences, there is limited comparative research on how dengue fever manifests in urban versus rural settings in Bangladesh. Understanding these distinctions is critical for developing effective public health interventions tailored to the unique needs of each population. This study aims to fill this gap by examining the epidemiological patterns and risk factors associated with dengue fever in an urban population in Dhaka and a rural population in Kaliganj Upazila, Gazipur district. Through this comparison, the study seeks to identify key factors contributing to the spread and impact of dengue in these different environments, thereby informing targeted strategies for dengue prevention and control across diverse settings in Bangladesh.

Materials and Methods:

This cross-sectional study was conducted between March and July 2023 to investigate the epidemiological patterns and risk factors associated with dengue fever in urban and rural populations. The study sites were Dhaka city for the urban population and Kaliganj Upazila in Gazipur district for the rural population. A total of 200 participants were selected, with 100 individuals from each area. Participants were recruited using a stratified random sampling method. The inclusion criteria included individuals aged 18 years and above who were either diagnosed with dengue fever or suspected of having dengue fever during the study period. Exclusion criteria were the presence of other febrile illnesses or refusal to participate. Data collection was conducted using a structured, pre-tested questionnaire, which covered demographic information, clinical features, environmental factors, behavioral practices, and health-seeking behaviors. Environmental data related to water storage practices, mosquito breeding sites, and the presence of stagnant water were also collected. Statistical analysis was performed using SPSS version 25. Descriptive statistics such as frequency, percentage, mean, and standard deviation were calculated for all variables. Chi-square tests were used to analyze associations between categorical variables, and t-tests were applied for continuous variables, with a p-value of less than 0.05 considered statistically significant.

Results:

Table-I shows the demographic characteristics of the participants. The mean age was slightly higher in the rural group (36.6 years) compared to the urban group (34.2 years), but the difference was not statistically significant. A higher percentage of participants from rural areas had no formal education (40%) compared to the urban participants (20%), which was statistically significant (p=0.01). Socioeconomic status also varied, with a greater proportion of the rural population (45%) belonging to the lower socioeconomic class compared to the urban population (25%) (p=0.02).

Table-I: Demographic Characteristics of the Study Population

Variable	Urban (n=100)	Rural (n=100)	Total (n=200)	p-value
Mean Age (years)	34.2±11.8	36.6±12.7	35.4±12.3	0.15
Gender (Male)	65(65%)	55(55%)	120(60%)	0.12
No Formal Education	20(20%)	40(40%)	60(30%)	0.01
Lower Socioeconomic Class	25(25%)	45(45%)	70(35%)	0.02

Table-II presents the clinical features and health outcomes of the participants. Fever was universally present in both groups. However, symptoms like headache, joint pain, and rash were more common in the urban population, though only the prevalence of rash was statistically significant (p=0.01). Hospitalization was more frequent among urban participants (40%) than rural participants (25%) (p=0.03). The history of previous dengue infection was also higher in urban areas (30%) compared to rural areas (15%) (p=0.01).

Table-II: Clinical Features and Health Outcomes

Variable	Urban (n=100)	Rural (n=100)	Total (n=200)	p-value
Fever	100(100%)	100(100%)	200(100%)	-
Headache	90(90%)	80(80%)	170(85%)	0.08
Joint Pain	75(75%)	65(65%)	140(70%)	0.13
Rash	60(60%)	40(40%)	100(50%)	0.01
Hospitalization	40(40%)	25(25%)	65(32.5%)	0.03
Previous Dengue Infection	30(30%)	15(15%)	45(22.5%)	0.01

Table-III outlines the environmental and behavioral factors associated with dengue fever. Rural areas had a significantly higher percentage of participants reporting uncovered water storage (60%) and stagnant water around their residence (70%), compared to urban areas (35% and 45%, respectively), both with p-values of 0.01. The use of mosquito nets was more common in rural areas (80%), while the use of mosquito repellents was more prevalent in urban areas (70%) (p=0.01 for both). Awareness about dengue transmission was higher in the urban population (75%) than in the rural population (50%) (p=0.01).

Table-III: Environmental and Behavioral Factors

Variable	Urban (n=100)	Rural (n=100)	Total (n=200)	p-value
Uncovered Water Storage	35(35%)	60(60%)	95(47.5%)	0.01
Stagnant Water Around the Residence	45(45%)	70(70%)	115(57.5%)	0.01
Mosquito Breeding Sites	40(40%)	65(65%)	105(52.5%)	0.01
Use of Mosquito Nets	55(55%)	80(80%)	135(67.5%)	0.01
Use of Mosquito Repellents	70(70%)	40(40%)	110(55%)	0.01
Awareness of Dengue Transmission	75(75%)	50(50%)	125(62.5%)	0.01

Table-IV highlights the health-seeking behaviors of the participants. Urban participants were more likely to seek medical care within 24 hours of symptom onset (60%) compared to rural participants (35%) (p=0.01). On the other hand, a higher percentage of rural participants visited government healthcare facilities (65%) compared to urban participants (30%) (p=0.01).

Table-IV: Health-Seeking Behavior

Variable	Urban (n=100)	Rural (n=100)	Total (n=200)	p-value
Medical Care within 24 Hours	60(60%)	35(35%)	95(47.5%)	0.01
Visited Government Healthcare	30(30%)	65(65%)	95(47.5%)	0.01

Discussion:

This study provides a comparative analysis of the epidemiological patterns and risk factors associated with dengue fever in urban and rural populations in Bangladesh, specifically in Dhaka and Kaliganj Upazila, Gazipur district. The findings revealed significant differences in several key areas, including

educational levels, socioeconomic status, environmental factors, clinical features, awareness about dengue transmission, and health-seeking behaviors. These disparities underscore the need for tailored public health interventions that address the unique challenges of each population.

The study identified a significant disparity in educational levels between urban and rural participants, with 40% of rural participants having no formal education compared to 20% in urban areas ($p=0.01$). This education gap may contribute to differences in awareness about dengue and its transmission, as education plays a crucial role in public health literacy. Additionally, socioeconomic status was notably lower among rural participants, with 45% belonging to the lower socioeconomic class compared to 25% in urban areas ($p=0.02$). Lower socioeconomic status has been associated with increased vulnerability to dengue due to factors such as inadequate housing and limited access to healthcare[12].

Environmental conditions significantly differed between the two populations, with rural areas showing a higher prevalence of risk factors that facilitate mosquito breeding. For example, 60% of rural participants reported uncovered water storage, compared to 35% in urban areas ($p=0.01$). Similarly, stagnant water around residences was more common in rural areas (70% vs. 45%, $p=0.01$). These conditions are conducive to the proliferation of Aedes mosquitoes, the primary vectors of dengue, and highlight the need for targeted environmental management interventions in rural areas[13].

Clinical manifestations of dengue also varied between the populations. Rash, a common symptom of dengue, was more prevalent among urban participants (60% vs. 40%, $p=0.01$). This difference could be attributed to variations in healthcare access and diagnostic practices between the two areas. Urban participants demonstrated higher awareness about dengue transmission[14], with 75% being knowledgeable compared to 50% in rural areas ($p=0.01$). This increased awareness likely influenced health-seeking behavior, as urban participants were more likely to seek medical care within 24 hours of symptom onset (60% vs. 35%, $p=0.01$). In contrast, rural participants were more inclined to visit government healthcare facilities (65% vs. 30%, $p=0.01$), reflecting differences in healthcare accessibility and utilization.

Conclusion:

The study reveals significant disparities in the risk factors, awareness, and health-seeking behaviors associated with dengue fever between urban and rural populations in Bangladesh. Urban areas demonstrated higher levels of awareness and faster medical response times, while rural areas exhibited greater environmental risk factors and lower socioeconomic status. These findings underscore the necessity for location-specific interventions to effectively manage and prevent dengue outbreaks. Public health strategies should focus on improving educational outreach and environmental management in rural areas, while also enhancing healthcare accessibility and awareness campaigns in both urban and rural settings. Tailored approaches that consider the unique needs of each population are essential for reducing the burden of dengue in Bangladesh and preventing future outbreaks.

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Original Article

Safe Inguinal Hernia Repair for Older Adults with Local Anesthesia Under Monitored Anesthesia Care

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Abstract

Background: *Local anesthetic (LA) is considered the optimal option for elective open inguinal hernia surgery due to its cost-effectiveness, reduced post-operative pain, and ability to facilitate faster recovery. Nevertheless, the involvement of local Anaesthesia (LA) in emergency inguinal hernia repair remains a subject of debate.*

Objective: *The objective of this study is to examine the safety and efficacy of local Anaesthesia (LA) in emergency inguinal hernia repair under monitored Anaesthesia care.*

Materials and Methods: *This cross-sectional observational study was conducted in the Department of Surgery, in a tertiary care hospital in Bangladesh, from August 2022 to August 2023. The study population consisted of individuals who were presented with inguinal hernia. The sample size consisted of 50 observations. The sampling technique employed was convenient.*

Results: *it is observed that a minimal proportion of the patient cohort reported adverse experiences during the procedure. Specifically, only 2 individuals, amounting to 4% of the patients, indicated the presence of pain. Additionally, a solitary patient, constituting 2% of the total, reported experiencing episodes of nausea/vomiting and headache. Within the Local Anaesthesia group, notable differences in key parameters were observed. Notably, patients in this group demonstrated a considerably shorter operative time, with an average duration of 46.35±7.8 minutes. Similarly, their hospital stay was notably abbreviated, with an average length of stay recorded at 1.02±0.57 days. It is noteworthy that a relatively low incidence of adverse events was documented. Specifically, only 2% of the patients encountered wound and scrotal hematoma, while postoperative pain was reported in 4% of the patients. Additionally, 2% of the patients in the study experienced urinary retention, and a similar proportion, 2%, reported inguinodynia. All patients are monitored by the presence of trained anaesthesiologist and monitored all vital parameters carefully. Pulse monitored 80.72±10.00, SBP 127.10±11.47, DBP 81.52±6.68, SPO2 96.28±2.05.*

Conclusion: *In conclusion, the approach of performing inguinal hernia repair under local anaesthesia in elderly patients, particularly those deemed high-risk candidates for regional or general anaesthesia, has demonstrated favorable patient tolerance and yielded promising outcomes. In the context of elderly patients characterized by a confluence of co-morbid conditions and heightened intraoperative risk, local anaesthesia emerges as a viable and beneficial alternative to traditional general or regional anaesthesia. This consideration aligns with the aim of optimizing safety and efficiency in hernia repair procedures while accommodating the unique healthcare needs of elderly individuals.*

Keywords: *Inguinal hernia, Older adults, Local anesthesiology, Safety and efficacy*

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Introduction:

Inguinal hernia is a prevalent medical issue that affects people of all ethnicities worldwide. Global estimates suggest that approximately 7% of the population will experience the development of an inguinal hernia. Repairing an inguinal hernia is necessary to avoid the potential complications of blockage or strangulation unless there are special reasons not to do so[1]. An inguinal hernia results in 4 million visits to clinics and 800,000 surgical procedures each year. Individuals who are 65 years or older have a 40% to 90% higher likelihood of developing hernias compared to younger persons[2]. Approximately 80% of inguinal hernia surgeries are conducted with general anesthesia, while only 15%-20% utilize local anesthetic. This is the case

even though no data is supporting better perioperative results with general anaesthesia[3]. Multiple small, randomized trials and observational studies have indicated that the use of local anaesthesia for hernia repair can decrease morbidity by approximately 30%, reduce unscheduled admissions by 20%, and lower surgical time and expenses by 15%. However, it is important to note that other studies have not found any meaningful changes in these outcomes[4]. These studies primarily examined younger people (under 65 years old) with few other medical conditions, largely neglecting older patients. Nevertheless, individuals who are 65 years old and above are more prone to get advantages by refraining from being exposed to general anaesthesia, as it can potentially elevate the likelihood of cognitive dysfunction and metabolic abnormalities[5]. Nevertheless, there is a lack of comprehensive studies on the postoperative outcomes of older persons who undergo inguinal hernia surgery under general or local anaesthesia, despite the common occurrence of this procedure. Furthermore, there have been no studies conducted to evaluate whether the potential advantages of local anesthetic differ according to age. The objective of this study was to evaluate and contrast the impact of local and general anaesthesia on the recuperation process following surgery in individuals aged 65 years and above. We also aimed to ascertain if the possible advantages of local anesthetic varied based on the age of the patient. The objective of this study is to examine the safety and efficacy of local anaesthesia (LA) in emergency inguinal hernia repair under monitored anaesthesia care.

Materials and Methods:

This cross-sectional observational study was conducted in the Department of Surgery, in a tertiary care hospital in Bangladesh, from August 2022 to August 2023. The study population consisted of individuals who were presented with inguinal hernia. The sample size consisted of 50 observations. The sampling technique employed was convenient. The study included individuals who underwent elective, unilateral, open inguinal hernia surgery. To reduce any potential confusion between the groups, we excluded patients who had additional procedures or surgeries that were not related to hernia repair, patients with bilateral hernias, patients with a primary diagnosis other than a unilateral inguinal hernia, patients who were dependent on a ventilator before surgery, or patients whose primary surgeon was not specialized in general surgery. We additionally excluded individuals who had anaesthesia categorized as epidural, spinal, regional, other, or unknown. To ascertain the distinction in anaesthesia mode according to patient age, we classified patients into four groups: those under 55 years, those between 55 and 64 years, those between 65 and 74 years, and those aged 75 years and above. Patients underwent assessment for anaesthesia suitability based on the American Society of Anesthesiology scale (ASA I-IV). The high-risk classification was based on the presence of comorbidities such as ischemic heart disease, prior cardiac surgery or stenting, chronic obstructive pulmonary disease (COPD), diabetes mellitus (DM), hypertension (HTN), arrhythmias, liver cirrhosis, obesity, chronic kidney disease, and abnormal coagulation profile. The study excluded individuals with recurring or bilateral illness, as well as those who were hesitant to undergo local anesthetic. A comprehensive history and meticulous physical examination were conducted. Systematic laboratory tests were conducted in each instance. Every patient underwent both chest X-ray and electrocardiogram (ECG) examinations. Explicit consent was obtained in every high-risk situation. Every patient had inguinal hernia repair using prosthetic mesh while under the effects of local anaesthesia. The anaesthetic solution employed consisted of a 50:50 combination of 1% xylocaine and 0.5% bupivacaine, together with 1:2,00,000 epinephrine. A skin weal was raised approximately 2.5 cm from the iliac rest, following the line connecting the anterior superior iliac spine to the umbilicus. The needle was thereafter positioned through this site to target the inner aspect of the iliac bone beneath the iliac crest. A solution of approximately 10 ml was injected as the needle was progressively removed. Following the reinsertion of the needle at a slightly steeper angle, a second injection was administered, delivering 5 ml of solution. For the second point of the block, a position located 2 centimeters above the midpoint of the inguinal region was chosen. At this site, a needle was inserted directly until it penetrated the aponeurosis of the external oblique. A volume of ten milliliters of solution was injected at this specific depth, and a needle was withdrawn over a distance of two centimeters, with a volume of five milliliters. Subsequently, another welt was elevated over the pubic tubercle and a subperiosteal injection of 3 cc of solution was administered. Subsequently, the block was successfully completed by injecting a 10 ml solution into the subcutaneous plane following the path of the surgical incision.

Results:

The baseline characteristics of the study cohort are elucidated in Table-I. The investigation unveiled that the age category encompassing individuals below 55 years of age exhibited the highest prevalence, with 26 cases, constituting 56% of the total population. Furthermore, within the total sample, 47 individuals (94%) were male, while a minority of 3 individuals (6%) were female, all of whom presented with inguinal hernia.

Regarding hernia types, the analysis indicated that 48 patients (96%) were afflicted with primary hernias, while only 2 patients (4%) experienced recurrent hernias. The distribution of hernia laterality revealed that unilateral hernias were manifest in 23 individuals, accounting for 46% of the total, whereas bilateral hernias were noted in 27 patients, representing 54% of the cohort.

A noteworthy observation was the co-occurrence of comorbidities among the study participants. Approximately half of the patients exhibited hypertension, constituting 50% of the population, while a significant proportion, specifically 39%, presented with ischemic heart disease. Diabetes mellitus (DM) was documented in 26% of the individuals under investigation. The majority of the patients, comprising 35 individuals (80%), were classified with an American Society of Anesthesiologists (ASA) score of I, indicating a lower level of anesthetic risk. Conversely, a smaller proportion, specifically 4 patients (8%), were categorized as having an ASA score of III, signifying a higher level of anesthetic risk.

Table-I: Baseline Profile (N=50)

Variance	Frequency	Percentage
Age		
<55 years	26	52%
55-64 years	13	26%
65-74 years	8	16%
75 years	3	6%
Sex		
Male	47	94%
Female	3	6%
Co-morbidities		
Obesity	2	4%
Hypertension	25	50%
Diabetes mellitus	13	26%
Arrythmias	1	2%
Ischemic heart disease	15	39%
Chronic obstructive pulmonary disease	7	14%
Chronic liver disease	2	4%
Renal failure	4	8%
Deranged clotting or bleeding profile	3	6%
Site of Hernia		
Unilateral	23	46%
Bilateral	27	54%
Type of Hernia		
Primary	48	96%
Recurrent	2	4%
ASA Grade		
I	35	80%
II	11	22%
III	4	8%

Within the Local Anaesthesia group, notable differences in key parameters were observed. Notably, patients in this group demonstrated a considerably shorter operative time, with an average duration of 46.35±7.8 minutes. Similarly, their hospital stay was notably abbreviated, with an average length of stay recorded at 1.02±0.57 days. (Table-II)

Furthermore, patients within the Local anaesthesia group exhibited expedited post-operative recovery, as evidenced by a notably reduced time to resume eating and ambulation. These findings suggest that local anaesthesia may contribute to enhanced efficiency in surgical procedures and facilitate a swifter post-operative recovery process.

Table-II: Intraoperative parameters (N=50)

Parameters	Mean±SB
Operative Time	46.35+7.8
Hospital stays	1.02+0.57
Time to Eat	1.28±0.581
Time to Ambulation	2.03±1.031

In Figure 1, it is observed that a minimal proportion of the patient cohort reported adverse experiences during the procedure. Specifically, only 2 individuals, amounting to 4% of the patients, indicated the presence of pain. Additionally, a solitary patient, constituting 2% of the total, reported experiencing episodes of nausea/vomiting and headache. These findings underscore the relatively low incidence of discomfort-related events among the study participants during the medical procedure under local anaesthesia.

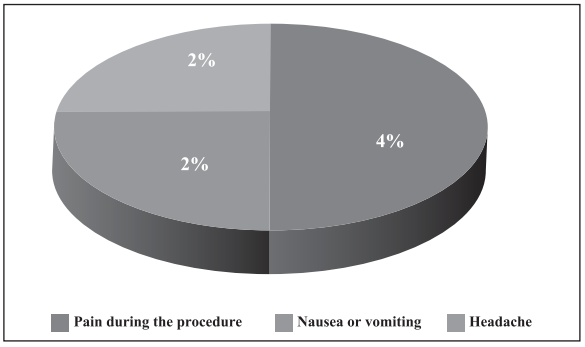

Figure-1: Complications of the Procedure

Table-III presents a summary of the parameters observed during the administration of anesthetic care for inguinal hernia repair utilizing local anaesthesia. The following vital signs were monitored and are reported as mean values with standard deviations: Pulse Rate: 80.72±10.00 beats per minutes. Systolic Blood Pressure (SBP): 127.10±11.47 millimeters of mercury (mmHg) Diastolic Blood Pressure (DBP): 81.52±6.68 mmHg. Oxygen Saturation (SPO2): 96.28±2.05 percent These measurements represent key indicators of the patient's physiological status during the surgical procedure, providing valuable insights into their overall well-being and response to local anaesthesia.

Table-III: Factors evaluated during anesthetic procedure (N=50)

Parameters	Mean±SB
Pulse	80.72±10.00
SBP	127.10±11.47
DBP	81.52±6.68
SPO2	96.28±2.05

Table-IV provides insight into the post-operative complications experienced by the patient cohort. It is noteworthy that a relatively low incidence of adverse events was documented. Specifically, only 2% of the patients encountered wound and scrotal hematoma, while postoperative pain was reported in 4% of the patients. Additionally, 2% of the patients in the study experienced urinary retention, and a similar proportion, 2%, reported inguinodynia. These findings underscore the relatively low prevalence of these complications within the examined patient population following the surgical procedure.

Table-IV: Post-Operative Outcome (N=50)

Variables	Frequency	Percentage
Wound hematoma	1	2%
Scrotal hematoma	1	2%
Urinary retention	1	2%
Postoperative pain (VAS >1)	2	4%
Inguinodynia	1	2%

Discussion:

The preference for utilizing general and regional anaesthesia in hernia repair procedures stems from their ability to provide effective anaesthesia precisely at the operative site. This objective is sometimes perceived as challenging to achieve under local anaesthesia, primarily due to perceived deficiencies in the technique of local anaesthesia administration, which can be attributed to insufficient training among surgeons in this specific approach. Various techniques for local anaesthesia administration have been documented in the literature[6,7,8,9,10].

In the context of inguinal hernia repair, general or regional anesthetics are typically favored, as they offer optimal surgical conditions characterized by adequate muscle relaxation and patient immobility. Additionally, these approaches confer the advantage of superior intraoperative and postoperative pain management. Nevertheless, it is worth noting that as patients age, they may develop a variety of co-morbid conditions that render them at higher risk for complications associated with general or regional anaesthesia.

In such circumstances, local anaesthesia can emerge as a safer alternative for these high-risk patients [11,12]. However, despite its potential benefits, the adoption of local anaesthesia as a surgical option remains relatively less popular among surgeons, reflecting prevailing trends and practices within the surgical community.

The use of local anaesthesia in the treatment of inguinal hernia varies significantly, with rates as low as 3% in Sweden, 18% in Denmark, and nearly 100% in specialized hernia centers such as the

Should Ice Clinic, Toronto clinic, and others[13].

The investigation disclosed that the age category comprising individuals under the age of 55 years displayed the highest prevalence within the studied population. It is noteworthy to mention that a study conducted by Rahmnan et al. observed a similar trend, with the highest prevalence documented in the age group spanning from 31 to 40 years[14]. These findings suggest a degree of consistency with regard to the age distribution of the condition under examination, as reported in the existing literature.

In a study conducted by Ira[15], it was observed that 90% of the documented cases of inguinal hernia were among male patients, with only 10% occurring in female patients. Similarly, in a study by Liechtenstein [16], a predominance of male patients was noted, with 94% of cases being males and 6% being females. These findings align with the established trend in which inguinal hernias tend to affect males more frequently than females across various age groups.

In the present study, a comparable distribution was identified, with 94% of the cases being male patients and 6% being females. This consistent male predominance in the incidence of inguinal hernias underscores a characteristic pattern observed in the demographics of this condition.

Our investigation revealed that the most prevalent co-morbid condition among the study cohort was hypertension, affecting 50% of the patients, followed by ischemic heart disease, which was observed in 39% of the cases. Chronic obstructive pulmonary disease (COPD) was identified in 14% of the patients, and diabetes was present in 26% of the individuals under study.

Interestingly, a study conducted by Amato B et al. corroborated these findings, with 25% of their patients suffering from hypertension, 50% from coronary disease, 10% from diabetes, and 12.5% from COPD. These shared co-morbid conditions emphasize the suitability of patients with these health profiles for hernia repair under local anaesthesia. It should be noted that the prevalence of these co-morbid conditions may exhibit geographical variations. Moreover, with respect to cardiovascular disease in the elderly population, a prior study by Frazzetta M et al. [17] observed that prosthetic hernioplasty conferred similar advantages, such as expedited recovery, in elderly patients with and without cardiac risk factors. Additionally, differences in the occurrence of early and late complications were noted between patients with and without cardiac risk factors, underscoring the need for tailored considerations in managing hernia repairs in individuals with underlying cardiovascular conditions.

All patients are monitored in the presence of trained anaesthesiologist and monitored all vital parameters carefully. Pulse monitored 80.72 ±10.00, SBP 127.10 ±11.47, DBP 81.52±6.68, SPO2 96.28±2.05. Furthermore, our analysis revealed notable differences in the occurrence of early or late complications among patients with and without cardiac risk factors. Specifically, only 4% of the patients experienced post-operative pain, which was effectively managed with the administration of intravenous sedation using midazolam (5mg administered intravenously). Nausea and vomiting were reported in 2% of the patients each, and these symptoms were successfully managed with central antiemetic agents, namely ondansetron (8mg intravenously, administered as a single dose). Additionally, headache was observed in a mere 2% of the patients, and it was effectively managed through intravenous infusion of paracetamol (500mg administered as a single stat dose).

The most prevalent post-operative issue encountered in our study was postoperative pain, which was observed in 4% of the patients, followed by scrotal hematoma, which developed in 2% of the cases. In a study by Shaikh et al. [18], successful recovery was documented in 90.7% of patients, with 5% experiencing wound infection. In a separate study by Amid et al., wound sepsis was observed in 2% of patients. Gianetta et al. [19] observed the development of scrotal hematoma in 2.7% of patients and wound sepsis in 0.7% of patients. In a study by Chowlek et al.[20], wound infection and scrotal edema were noted in 3.5% of patients, while urinary retention was observed in 1.75% of patients.

In our study, inguinodynia was noted in 1% of patients, a notably lower rate compared to the findings of Erhan et al.[21], who reported inguinodynia in 4-6% of cases, and Phoolbalan et al. [22], who documented inguinodynia in 10% of cases following prosthetic repair of inguinal hernia. The reduced incidence of inguinodynia in our study may be attributed to the meticulous identification and management of the ilioinguinal or iliohypogastric nerves during open dissection. Additionally, the involvement of experienced consultant surgeons in all surgeries may have contributed to this lower rate. Importantly, no mortality was observed in our study, and none of the studies conducting this procedure under local anaesthesia documented any cases of mortality.

Inguinal hernia predominantly affects individuals in middle and old age; a demographic often burdened with cardiac, pulmonary, and urinary tract diseases. These patients are at higher risk of developing complications in these areas when undergoing hernia repair under general or spinal anaesthesia. Local anaesthesia is considered a safer option in such cases. Anaphylaxis is a known complication of local anaesthesia, with reported rates of approximately 1% in studies such as the one conducted by Davis et al. in 2003 [23]. In our study, no cases of anaphylaxis were reported. Local anaesthesia's gradual onset of pain contributes to reduced post-operative pain and a decreased need for post-operative. The incidence of intraoperative pain is a significant concern for patients, and our study notably recorded a very low occurrence of pain during the surgical procedure.

Conclusion:

In conclusion, the approach of performing inguinal hernia repair under local anaesthesia in elderly patients, particularly those deemed high-risk candidates for regional or general anaesthesia, has demonstrated favorable patient tolerance and yielded promising outcomes. In the context of elderly patients characterized by a confluence of co-morbid conditions and heightened intraoperative risk, local anaesthesia emerges as a viable and beneficial alternative to traditional general or regional anaesthesia. This consideration aligns with the aim of optimizing safety and efficiency in hernia repair procedures while accommodating the unique healthcare needs of elderly individuals.

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Original Article

Evaluation of the Ponseti Method and Surgical Correction for Clubfoot

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Abstract

Background*: Talipes equinovarus, or congenital clubfoot, is a foot musculoskeletal abnormality evident from birth. One in 1,000 live babies had this congenital limb abnormality. Clubfoot, caused by aberrant foot and ankle posture and alignment, can provide a distinctive look and functional handicap if not treated quickly.*

Objective*: The objective of this study was to evaluate and compare the outcocme of the Ponseti method and surgical treatment.*

Materials and Methods: *This cross-sectional study was conducted at the department of orthopedic in a tertiary care hospital in Bangladesh. The study included the medical records of all children who visited the hospital between January 2022- December 2022 and were under the age of five throughout their treatment for idiopathic club foot.*

Results*:The study showed that dynamic stiffness while walking was observed in both single-segment and multi-segment kinematic outcomes, such as ankle dorsiflexion (DF), plantar flexion (PF), and varus/valgus range of motion ($p<0.01$). Both the swing and stance phases exhibited limited mobility in the sagittal plane. Both treatment groups experienced a decrease in force production, but the surgical group showed a considerably greater reduction compared to normal values. The average power generated during ankle push-off was 24.9±6.5 watts per kilogram. The Ponseti group (18.2±5.8 watts/kg) was much closer to this normal value compared to the surgical group (13.5±3.9 watts/kg; $p<0.01$). The ankle plantar flexor moment during stance was significantly decreased in both groups compared to the normal value ($p<0.01$).The Ponseti outcomes showed a considerably higher level of normalcy compared to the operating group in terms of the coronal plane pressure index, which measures varus/valgus alignment ($p<0.01$). However, both groups exhibited significantly different levels of medial forefoot pressure and lateral midfoot pressure compared to normal (Table-III; $p<0.01$). Both groups had residual varus foot pressure distribution, but the surgical group showed considerably larger varus (−36.8±24.7) compared to the Ponseti group (−15.7±18.9) and a normal population (11.0±23.6; $p<0.01$). The analysis of pressure on the middle part of the front of the foot indicated a small correction above the normal range in the Ponseti group (39.8±11.9), whereas the operative group exhibited a considerable correction below the normal range (19.1±8.8) compared to the average pressure (33.5±9.2; $p<0.01$). The lateral midfoot pressures in both treatment groups were significantly elevated compared to the normal value, mostly due to the presence of residual varus ($p<0.01$). The surgical group showed significant improvement in correcting heel impulse (32.2±14.4) compared to the normal value (37.3±9.6), but the Ponseti group had a somewhat greater impulse (42.2±16.0).*

Conclusion*: The treatment for congenital clubfoot usually commences shortly after birth to rectify the foot abnormality and enhance functionality. The Ponseti method is a highly utilized and efficacious therapy procedure. Bracing is employed to uphold the corrected position and avert relapse. The duration of the treatment typically spans several months to maintain good alignment of the foot.*

Keywords: *Club foot, Congenital deformity, Ponseti method, Surgical method.*

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Introduction:

Congenital clubfoot deformity is the most often occurring congenital abnormality, with a prevalence of one to two cases per 1000 live births[1]. It is characterized by the foot being fixed in a hand-like position with the toes pointing inward, the sole facing upward, and the heel turning inward, along with associated anomalies in the soft tissues[2].

In the past, the majority of children required surgical procedures for clubfoot; however, in the last two decades, Ponseti therapy has become widely recognized as the standard approach for treating this condition globally[3,4,5]. Comprehensive surgical

release is the established and continuing practice when initial nonoperative treatment for clubfoot is unsuccessful. The clinical and radiological outcomes of surgical treatment are excellent. However, when considering long-term follow-up results, which include clinical examinations, questionnaires, radiographic analyses, and gait kinematics, the findings are disappointing[6]. Furthermore, teenagers who have undergone corrective surgery for clubfeet during infancy exhibit lingering pain, reduced strength, and functional impairments in comparison to children who develop typically[7]. The manipulation technique outlined by Ignatio Ponseti[8] has demonstrated superiority over surgical intervention in multiple retrospective investigations[9,10], thereby altering our approach to managing clubfoot deformity. The Ponseti method is a secure and efficient treatment strategy for clubfeet, which reduces the necessity for significant corrective surgery [11]. No randomized prospective trials comparing the long-term follow-up of Ponseti with surgical treatment have been documented, despite the existence of prospective studies [12],[13] and studies with a mid- and long-term follow-up[14,15]. The objective of this study was to evaluate and compare the outcome of the Ponseti method and surgical treatment.

Materials and Methods:

This cross-sectional study was conducted at the department of orthopedic at Holy Family Medical College Hospital. The study included the medical records of all children who visited the hospital between January 2022- December 2022 and were under the age of five throughout their treatment for idiopathic club foot. Nevertheless, individuals with a neurological club foot or those who did not undergo the full treatment were not included in the study. The record data collected was divided into two groups: Surgical group and Ponseti group. The total sample was 35. The Ponseti method was applied in 26 cases and the surgical method was applied in 9 patients.

Results:

Table-I displays the age and sex distribution of both groups. Within group A, 25 cases (96.15%) were between the ages of 1 and 2 years, while just 1 case (3.85%) was older than 2 years. Within group B, 7 cases (77.78%) were between the ages of 1 and 2 years, whereas 2 cases (22.22%) were older than 2 years. Within group a, there were 19 instances (73.08%) that were male, and 7 cases (26.92%) that were female. In group B, 6 individuals (66.67%) were male, whereas 3 individuals (33.33%) were female.

Table-I: Socio-demographic profile. (n=35)

Variables	Group A (Ponseti) (n=26)	Group B (Surgery) (n=9)	P-value
Age(Years)			
1-2	25(96.15%)	7(77.78%)	
>2	1(3.85%)	2(22.22%)	
Sex			
Male	19(73.08%)	6(66.67%)	0.134
Female	7(26.92%)	3(33.33%)	
No of Clubfoot	43	15	
Bilateral involvement	24	7	0,8
Average Pirani score per foot (points)	5.2	5.2	0.9

The range of motion during walking was decreased in both groups compared to normal reference values, but it was much more reduced in the group that had undergone surgery (Tables II and III). The study showed that dynamic stiffness while walking was observed in both single-segment and multi-segment kinematic outcomes, such as ankle dorsiflexion (DF), plantar flexion (PF), and varus/valgus range of motion ($p<0.01$). Both the swing and stance phases exhibited limited mobility in the sagittal plane.Both treatment groups experienced a decrease in force production, but the surgical group showed a considerably greater reduction compared to normal values. The average power generated during ankle push-off was 24.9±6.5 watts per kilogram. The Ponseti group (18.2±5.8 watts/kg) was much closer to this normal value compared to the surgical group (13.5±3.9 watts/kg; $p<0.01$). The ankle plantar flexor moment during stance was significantly decreased in both groups compared to the normal value ($p<0.01$).

The Ponseti outcomes showed a considerably higher level of normalcy compared to the operating group in terms of the coronal plane pressure index, which measures varus/valgus alignment ($p<0.01$). However, both groups exhibited significantly different levels of medial forefoot pressure and lateral midfoot pressure compared to normal (Table-III; $p<0.01$). Both groups had residual varus foot pressure distribution, but the surgical group showed considerably larger varus (−36.8±24.7) compared to the Ponseti group (−15.7±18.9) and a normal population (11.0±23.6; $p<0.01$). The analysis of pressure on the middle part of the front of the foot indicated a small correction above the normal range in the Ponseti group (39.8±11.9), whereas the operative group exhibited a considerable correction

Table-II: Kinematics in children with clubfeet (parametric statistical comparison for normally distributed data: ANOVA)

Variables	Normal range Mean±SD	Group A (Ponseti) Mean±SD	Group B (Surgery) Mean±SD	P-value
Multi-segment foot kinematics				
Arch height	0.26±0.04	0.29±0.05	0.27±0.06	0.06
Single-segment foot kinematics				
Ankle DF/PF range (°)	28.3±4.1	24.2±2.8	19.4±3.3	<0.0001
Ankle push-off power generation (watts/Kg)	24.9±6.5	18.2±5.8	13.5±3.9	<0.0001
Ankle max. PF (°)	14.4±4.5	11.8±4.8	7.8±6.5	<0.0001
Ankle peak moment stance (Nm/Kg)	2.2±1.0	1.4±0.7	1.4±0.5	<0.0001
Foot progression stance mean (external +)	6.4±4.5	4.1±6.2	0.8±6.7	<0.0001
Foot rotation compared to tibia (external +)	−7.8±6.2	−4.5±6.4	−13.6±6.3	<0.0001
Tibial torsion stance mean (external +)	15.4±7.4	8.5±11.2	6.5±9.4	<0.0001

Table-III: Pedobarograph in children with clubfeet

Foot pressure	Normal range Mean±SD	Group A (Ponseti) Mean±SD	Group B (Surgery) Mean±SD	P-value
Coronal plane pressure index (varus −/valgus +)	11.0±23.6	−15.7±18.9	−36.8±24.7	<0.0001
Heel impulse	37.3±9.6	42.2±16.0	32.2±14.4	0.006
Medial forefoot pressure	33.5±9.2	39.8±11.9	19.1±8.8	<0.0001

below the normal range (19.1±8.8) compared to the average pressure (33.5±9.2; $p<0.01$). The lateral midfoot pressures in both treatment groups were significantly elevated compared to the normal value, mostly due to the presence of residual varus ($p<0.01$). The surgical group showed significant improvement in correcting heel impulse (32.2±14.4) compared to the normal value (37.3±9.6), but the Ponseti group had a somewhat greater impulse (42.2±16.0).

The Ponseti group exhibited greater mobility than the operative group in all of the passive range of motion tests that were measured, including dorsiflexion, plantarflexion, total arc plantarflexion/dorsiflexion, forefoot inversion, forefoot eversion, midfoot abduction, and midfoot adduction (Table-IV; $p<0.01$). There was no notable disparity in dorsiflexion between the normal group and the Ponseti group, but, the surgical group had a substantial decrease in dorsiflexion ($p<0.01$). The degree of plantarflexion was significantly lower than the normal range (56.2±6.1) in both groups ($p<0.01$). However, the reduction was much more pronounced in the surgical group (28.0±10) compared to the Ponseti group (51.3±10.3; $p<0.01$).

Table-IV: Physical examination in children with clubfeet

Foot pressure	Normal range Mean±SD	Group A (Ponseti) Mean±SD	Group B (Surgery) Mean±SD	P-value
PF PROM (°)	56.2±6.1	51.3±10.3	28.0±10.	<0.0001
DF/PF passive range (total arc motion (°)	68.8±5.3	61.0±12.6	27.5±9.2	<0.0001
Forefoot inversion (°) PROM	36.8±4.5	41.6±9.3	29.3±16.3	0.0001
Midfoot adduction (°) PROM	20	24.6±8.6	8.5±5.8	<0.0001
Standing single heel-raise height (cm)	N/A	7.8±1.6	5.7±2.3	<0.0001

Discussion:

Clubfoot is a common musculoskeletal congenital abnormality[16]. Many institutions today prefer to employ initial nonoperative care as the primary treatment for clubfoot. This is mainly due to the positive outcomes reported by Ponseti and other researchers in both the short and long term. While the majority of surgical studies have reported favorable results, a significant proportion of feet still necessitate additional surgical procedures. Furthermore, the possibility of surgical complications remains present at each successive intervention[17-18].

Various testing procedures were used to evaluate residual deformities in different treatments and to inform future treatment approaches. Previously, a limited number of studies have employed gait analysis to assess the efficacy of clubfoot treatment[19]. However, this research have only focused on analyzing the movement of a particular segment of the foot. This work represents the initial comprehensive analysis of the Ponseti and surgical therapies for clubfoot, incorporating the utilization of multi-segment foot kinematics. Multi-segment foot kinematics enable the precise measurement of dynamic foot abnormalities, which were previously unanalyzable in such depth. These examinations are crucial while examining clubfoot due to the fact that the foot itself is the focal area of the deformity.

The technical output is evaluated through the examination of kinematic and pedobarograph data obtained from gait analysis. The surgical group exhibited a substantial reduction in dorsiflexion, but the Ponsetigroup-maintained dorsiflexion within the usual range. Previous investigations have documented a decrease in the force exerted during push-off in the sagittal plane. Our findings align with these results. The Ponseti outcomes showed a considerably higher level of normalcy compared to the operating group in terms of the coronal plane pressure index, which measures varus/valgus alignment ($p < 0.01$). However, both groups exhibited significantly different levels of medial forefoot pressure and lateral midfoot pressure compared to normal (Table-III; $p < 0.01$). Both groups had residual varus foot pressure distribution, but the surgical group showed considerably larger varus (−36.8±24.7) compared to the Ponseti group (−15.7±18.9) and a normal population (11.0±23.6; $p < 0.01$). The analysis of pressure on the middle part of the front of the foot indicated a small correction above the normal range in the Ponseti group (39.8±11.9), whereas the operative group exhibited a considerable correction below the normal range (19.1±8.8) compared to the average pressure (33.5±9.2; $p < 0.01$)[19]. The lateral midfoot pressures in both treatment groups were significantly elevated compared to the normal value, mostly due to the presence of residual varus ($p < 0.01$). The surgical group showed significant improvement in correcting heel impulse (32.2±14.4) compared to the normal value (37.3±9.6), but the Ponseti group had a somewhat greater impulse (42.2±16.0)[20-21].

The Ponseti group exhibited greater mobility than the operative group in all of the passive range of motion tests that were measured, including dorsiflexion, plantarflexion, total arc plantarflexion/dorsiflexion, forefoot inversion, forefoot eversion, midfoot abduction, and midfoot adduction (Table-IV; $p < 0.01$). There was no notable disparity in dorsiflexion between the normal group and the Ponseti group, but, the surgical group had a substantial decrease in dorsiflexion ($p < 0.01$). The degree of plantarflexion was significantly lower than the normal range (56.2±6.1) in both groups ($p < 0.01$). However, the reduction was much more pronounced in the surgical group (28.0±10) compared to the Ponseti group (51.3±10.3; $p < 0.01$)[22].

Conclusion:

The treatment for congenital clubfoot usually commences shortly after birth to rectify the foot abnormality and enhance functionality. The Ponseti method is a highly utilized and efficacious therapy procedure. Bracing is employed to uphold the corrected position and avert relapse. The duration of the treatment typically spans several months to maintain good alignment of the foot.

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Original Article

Saline Infusion Sonohysterography (SIS) and Hysterosalpingography to See the Tubal Patency in Infertility in Bangladesh

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Abstract

Introduction: *The aetiology of infertility is complex, with fallopian tube abnormalities being one of the major contributors. These abnormalities account for up to 40%, if not less, of female subfertility and are on the rise. As a routine test for evaluating the uterine cavity in the investigation of infertility and abnormal uterine bleeding, saline infusion sonohysterography (SIS) is becoming more and more popular. It is widely practiced and accepted as a screening tool for assessing tubal patency in infertile patients attending infertility clinics.*

Objective: *To assess the efficacy of SIS in determining endometrial disease and tubal patency in infertile patients by contrasting its findings with those of hysterosalpingography.*

Materials and Methods: *Based on the information kept in the ultrasound registry and case record sheets of all infertile women who received infertility treatment and met the inclusion requirements between June 2021 and August 2021, a retrospective, observational analysis was conducted.*

Results: *HSG revealed only 12 tubes with bilateral occlusion and the test confirmed only 8 occluded tubes SIS found 8 tubes with bilateral block. 66.67% of the patients had a score between 1-3 score in SIS and 66.67% of the patients had a score of 4-6 score of pain score in HSG retrospectively.*

Conclusion: *SIS can be a helpful tool in the first workup of infertile patients with improved compliance, cheap cost, and better results in a single visit in low-resource countries where patients are also less educated.*

Keywords**:** *Hysterosalpingography, intrauterine pathology, saline infusion sonography, tubal patency.*

Introduction:

In a nation like Bangladesh, the problem of infertility (subfertility) is growing daily. The World Health Organization reports [1] that approximately 10% of women worldwide struggle with infertility. The causes of infertility are complex, with abnormalities of the fallopian tube being one of the main culprits. This condition can account for as much as 40% of female subfertility, if not more, and is still rising [2,3]. Therefore, one of the most crucial initial stages in evaluating the fertility of infertile couples is to screen for tubal occlusion. As of right now, laparoscopy with chromotubation is the primary method of examination, followed by hysterosalpingography (HSG)[4]. HSG, or contrast-enhanced fluoroscopic radiography, is a routine diagnostic method used in the evaluation of female infertility. In addition to providing data on tubal patency and contour, it also aids in the evaluation of the uterine cavity, providing details on its dimensions, form, contour, and filling defect, which may indicate the presence of fibroids, adhesions, polyps, or other abnormalities. It has several limits and downsides, such as the usage of iodinated contrast and harsh and uncomfortable X-rays for the patients. Although laparoscopy with chromopertubation is generally chosen for the examination or treatment of other related pelvic diseases, it is widely acknowledged as the gold standard for diagnosing tubal occlusion.

Because it is an intrusive operation, there will be additional costs and side effects as anesthetic is required. Sonohysterography, or hysterosonography,

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is another name for saline infusion sonohysterography (SIS), which is becoming more and more used and approved as a screening method for determining tubal patency in infertile individuals visiting infertility clinics [5]. It has gained traction as a standard examination for assessing the uterine cavity in cases of infertility and irregular uterine bleeding [6-9]. Doppler and B mode ultrasonography (US) can be used for SIS. The term "SIS" describes a process whereby a catheter is used to introduce fluid transcervically into the uterus, improving endometrial visualisation during transvaginal US testing [10,11]. Numerous studies recommend using SIS to assess uterine abnormalities in individuals undergoing in vitro fertilisation (IVF) and those who have experienced repeated miscarriages. SIS can show a patent tube, but if the tube is obstructed, it is hard to elicit the block site. Improved sonographic detection of endometrial diseases, including polyps, hyperplasia, leiomyomas, and occasionally adhesions, is made possible with the help of SIS. Furthermore, it has the potential to mitigate the need for invasive diagnostic procedures in certain patients and enhance the preoperative evaluation process for women in need of therapeutic intervention. It is a well-tolerated procedure with a comparatively low risk of serious complications and side effects. It may be completed quickly and easily at a modest cost.

Materials and Methods:

This retrospective observational study was conducted at Shahabuddin Medical College Hospital over the period from July 2022 to June 2023. The study involved a sample size of 90 participants, and the sampling method employed was purposive sampling. A minimum sample size of 90 participants was determined after adjusting the test validity parameters of HSG about SIS from the literature at alpha=0.05 and a research power of 80%. Additionally, a 10% contingency was added for any dropout instances during the study. All patients underwent an initial workup that included a thorough clinical history to determine potential predisposing factors leading to infertility as well as the length of time that symptoms had existed. Every patient got a thorough pelvic and general examination by established treatment protocol. Following their diagnosis of tubal patency, the results of SIS and HSG, which were conducted by an impartial observer in the assessment of the uterine cavity and tubal patency, were compared.

Anonymized data were used in the investigation, which was conducted using SPSS version 22 (IBM Corp., Armonk, USA). Ordinal data were transformed into frequencies and percentages,

The chi-square test was used to look at the relationship variables. Significantly was defined as a 0.05 p-value.

Results:

Table-I highlights the demographic characteristics of patients, and there were more cases of primary infertility (74.3%) than secondary infertility (23.4%) Approximately 97% of the patients fall between the age group of 23 and 32 years.

Table-I: Demographic Characteristic

Type of Infertility	Frequency	Percentage (%)
Primary	66	74.3
Secondary	21	23.4
Age distribution of Participants		
18-22	8	8.6
23-27	43	47.6
28-32	37	41.53
33-38	9	9.6

Table-II demonstrates that SIS detected pelvic organ pathology more accurately than HSG and that it had the extra benefit of detecting adnexal pathology, which HSG was unable to detect. Patients exhibiting pathology or any other anomaly were all referred for diagnostic hysterolaproscopy.

Table-II: Pelvic Organ Abnormalities

Pathology	HSG (n=48), frequency (%)	SIS (n=42), frequency (%)
Normal pelvic organs	32(66.7))	31(74.4)
Endometrial hyperplasia	0	1(3.8)
Submucous fibroid	6(12.5)	0
Endometrial polyp	0	0
Ovarian cyst/to mass	0	3(7.8)
Hydrosalpinx	1(2.08)	0
Synechiae	3(6.25)	0
Congenital	4(8.33)	1(3.38)

According to Table-III, SIS is clearly more accurate than HSG at identifying pelvic organ pathology, which is corroborated by diagnostic hysterolaproscopy. This table shows that hysterosalpingography has the highest prevalence of hydrosalpinx and synechiae.

Table-III: Uterine and Adnexal Pathology

Pathology	HSG (n=23), frequency (%)	SIS (n=20), frequency (%)
Endometrial hyperplasia	0	1(5)
Submucous fibroid	0	1(5)
Endometrial polyp	0	3(15)
Ovarian cyst/to mass	0	5(25)
Hydrosalpinx	2(8.69)	1(5)
Synechiae	2(8.69)	1(5)
Congenital	1(4.35)	2(10)

HSG=Hysterosalpingography, SIS=Saline infusion Sonohysterography.

Table-IV indicates that while HSG revealed only 12 tubes with bilateral occlusion SIS found 8 tubes with bilateral block. Three and four of the patients have unilateral black in SIS and HSG retrospectively.

Table-IV: Tubal Patency on Saline Infusion Sonohysterography Versus Hysterosalpingography

Pathology	HSG (n=23), frequency (%)	SIS (n=20), frequency (%)
Description	SIS	HSG
B/P (63)	31	32
B/B (20)	8	12
U/B (7)	3	4

B/P=Bilateral patency, B/B=Bilateral block, U/B=Unilateral block, HSG= Hysterosalpingography, SIS=Saline infusion sonohysterography

Table-V comparing pain scores between SIS (N=42) and HSG (N=48) procedures reveals a significant difference. For SIS, 66.67% reported low pain (1-3), 30% moderate pain (4-6), and 3.33% high pain (7-10). In HSG, 66.67% reported moderate pain, and 33.33% reported high pain, with none reporting low pain. The difference is statistically significant for moderate pain (P=0.002). This suggests that SIS is associated with lower moderate pain compared to HSG, emphasizing the importance of considering pain outcomes in procedure selection.

Table-V: Pain Score in 10 Point Scale

Pain Score	SIS N=42	HSG N=48
1-3 score	28(66.67)	0(0)
4-6 score	12(30)	32(66.67)
7-10 score	1(3.33)	15(33.33)

Table-VI: Advantages and Disadvantages of SIS and HSG

Procedure	Advantages	Disadvantages
SIS	(1) Relatively easy to perform (2) Cost effective (3) Does not cause patient discomfort (4) 3-D scan can be performed simultaneously to aid in the detection of uterine anomalies	(1) an inability to determine final endometrial disease (2) A slower learning curve compared with noncontrast TVUS. (3) Inability to provide histology
HSG	(1) It is capable of determining tubal patency (2) It delineates polyps and fibroids.	(1) HSG is expensive (2) Risk of iodinated contrast and radiation exposure (3) One is unable to comment on the ovaries or endometrial thickness.

Table-VI explains the advantages and disadvantages of Saline Infusion Sonohysterography (SIS) is praised for its ease, cost-effectiveness, and minimal patient discomfort. Simultaneous 3-D scanning aids in detecting uterine anomalies, but drawbacks include difficulty determining final endometrial disease and a steeper learning curve. Hysterosalpingography (HSG) determines tubal patency and identifies polyps and fibroids but comes with a higher cost, risk of contrast and radiation exposure, and an inability to assess ovaries or endometrial thickness.

Discussion:

In developing nations like Bangladesh, the rate of infertility is continually rising. Due to limited resources in Bangladesh, patients may not always be able to afford repeated visits. Therefore, it is important to establish a management strategy that enables the largest number of irregularities and diseases to be identified in a single visit. All infertile patients must undergo baseline sonography to assess tubal patency and to look for pathology in the uterus, adnexa, ovaries, and uterine cavity. The examination that can yield the most information in an average of minutes when conducted on days 8–9 is saline infusion sonography[10-15]. Baseline TVS would identify any uterine diseases, such as fibroid, ovarian mass, and polyp, as well as provide information on the size and growth of developing follicles as well as any fluid present in the Douglas pouch.

When it comes to examining several endometrial diseases, including septas, submucous myomas, endometrial polyps, and intrauterine adhesions, SIS is quite effective. Because there aren't many studies showing similar accuracy in identifying endometrial diseases, SIS should be performed on each patient suspected of having one before recommending hysteroscopy. In many centres across the world, SIS and hysterosalpingo-contrast sonography are taking the place of HSG for evaluating the uterine cavity and fallopian tubal patency due to advancements in US imaging[5-12].

In this study, we held HSG as the gold standard and evaluated how well SIS performed in tubal patency diagnosis. Furthermore, all patients in whom pelvic pathology was found or tubal block was suspected had chromopertubation and diagnostic hysteroscopy with laparoscopy. The test performance parameters of SIS were similar to those of HSG. Testing confirmed that there were only eight bilaterally blocked tubes that SIS had found. HSG revealed just ten bilaterally occluded tubes[13-17].

In this study, we held HSG as the gold standard and evaluated how well SIS performed in tubal patency diagnosis. Furthermore, all patients in whom pelvic pathology was found or tubal block was suspected had chromopertubation and diagnostic hysteroscopy with laparoscopy. The test performance parameters of SIS were similar to those of HSG, with an accuracy of 90% in detecting tubal patency. By observing the turbulence of fluid moving in the tubes and observing the collection of fluid in the Douglas pouch, we found that SIS was quite accurate in detecting tubal patency. However, we encountered difficulties in recognizing side-specific tubal patency, likely due to changing turbulence in the tubes with blockage.

The present study and other studies have demonstrated that SIS is more accurate than transvaginal sonography and HS in diagnosing endometrial abnormalities and submucous/intramural myomas in women with abnormal uterine haemorrhage. SIS uses saline for both its negative contrast agent qualities during transvaginal ultrasonography and its ability to cause uterine distention in order to visualise structural endometrial abnormalities. Recent reports have detailed the use of SIS in the infertile population, where it may reduce pain and expense while increasing accuracy compared to HS and HSG[18-19].

Our investigation clearly showed that in the diagnosis of uterine cavity pathology, SIS was more sensitive but less painful than hysteroscopy or HSG. When compared to SIS, hysteroscopy unquestionably yields more tolerant results in the diagnosis of endometrial pathology; nonetheless, SIS is a valuable screening procedure that can be used to screen all infertile patients, with more benefits than drawbacks.

Conclusion:

SIS can be a helpful tool in the first workup of infertile patients with improved compliance, cheap cost, and better results in a single visit in low-resource countries where patients are also less educated.

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Original Article

Cervical Carcinoma in Urban Bangladesh: Unveiling Risk Factors, Health-Seeking Behavior, Attitudes and Knowledge among Nursing Students in Rajshahi, Bangladesh

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Abstract:

Background: *Cervical carcinoma remains a significant health issue, particularly in low- and middle-income countries. Understanding the knowledge, attitudes, and health-seeking behaviors of at-risk populations, such as nursing students, is crucial for developing effective prevention strategies.*

Objective: *This study aims to evaluate the risk factors, health-seeking behaviors, attitudes, and knowledge related to cervical carcinoma among nursing students in Rajshahi, Bangladesh.*

Materials and Methods: *This cross-sectional study was conducted from January to June 2024, involving 150 female nursing students aged 18-25 years from three randomly selected nursing institutions in Rajshahi. Data were collected through a structured questionnaire covering socio-demographic characteristics, knowledge about cervical carcinoma, attitudes towards screening and vaccination, and health-seeking behavior.*

Results: *Among the participants, 90(60%) had good knowledge about cervical carcinoma, while 60(40%) had poor knowledge. A total of 110(73.3%) displayed a positive attitude towards screening, and 90(60%) were willing to receive the HPV vaccine. Factors significantly associated with better knowledge and more positive attitudes included exposure to health education (Odds Ratio=4.0, 95% CI: 2.3-6.8, p<0.001), having a bachelor's degree (Odds Ratio=2.5, 95% CI: 1.5-4.2, p=0.002), and having a family history of cancer (Odds Ratio=3.1, 95% CI: 1.8-5.4, p<0.001).*

Conclusion: *The study highlights that a substantial proportion of nursing students in Rajshahi possess good knowledge and positive attitudes towards cervical cancer prevention. Factors such as higher educational level, family history of cancer, and exposure to health education significantly contribute to better knowledge and more favorable attitudes. These findings underscore the importance of enhancing educational programs and increasing exposure to health education to improve preventive practices.*

Key words: *Cervical carcinoma, Attitudes, and Knowledge, Nursing students*

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Introduction:

Cervical cancer is the second most prevalent cancer among women worldwide, following breast cancer. Evidence indicates that human papillomavirus (HPV) infection is a primary cause of cervical neoplasia, with malignant transformation becoming more probable when high-risk HPV genital subtypes are present[1]. Early screening is crucial for detecting cervical cancer; however, awareness and uptake of early screening methods are notably low in developing countries[2]. Conversely, in affluent nations, the widespread use of the Papanicolaou (Pap) smear has significantly reduced the incidence of cervical cancer. Early detection of abnormal cytologic changes can prevent progression from preinvasive to invasive disease[3].

In the 21st century, cervical cancer remains a significant risk for women worldwide. It ranks as the

third most prevalent cancer among Asian women and is the leading cause of cancer-related death in women from low- and middle-income countries[4,7]. In Bangladesh, over 50 million women are at high risk of developing cervical cancer, with 17,686 new cases and 10,362 deaths reported annually[5-8]. Many women in developing countries like Bangladesh are unaware of cervical cancer, and those who have heard about it often lack adequate knowledge, exacerbating the problem. Raising awareness and improving knowledge among women are crucial steps in reducing cervical cancer mortality[9].

The Government of Bangladesh has implemented the visual inspection with acetic acid (VIA) method for cervical cancer screening, which is cost-effective and allows for immediate treatment in low-resource settings[5,6]. The program also provides rapid training for providers. Colposcopy is recommended for screen-positive cases, and patients with precancerous or cancerous conditions are referred for local ablative procedures or to government oncology departments for advanced treatments such as loop electrosurgical excision procedures and thermal ablation[10].

Cervical cancer represents 6%–29% of all malignancies among women in India[11]. In neighboring Pakistan, where 68.6 million women over 15 years old are at risk, approximately 5,008 new cases are diagnosed annually, with 3,197 deaths from the disease[12]. These statistics highlight a significant healthcare concern for Bangladeshi physicians. According to the International Agency for Research on Cancer, over 50 million Bangladeshi women are at risk of cervical cancer, with 17,686 new cases and 10,362 deaths occurring each year[13]. Effective treatment is possible if cervical cancer is detected early, particularly since HPV genotypes 16 and 18 are responsible for about 70% of cases. Consequently, screening programs are essential for early detection before the disease advances to a more aggressive stage[14].

Cervical carcinoma is a major public health concern globally, especially in low- and middle-income countries where access to screening and vaccination may be limited. In Bangladesh, the prevalence of cervical cancer remains high, and preventive measures such as vaccination and regular screening are crucial to reduce morbidity and mortality associated with the disease. As future healthcare providers, nursing students play a critical role in promoting cancer awareness and preventive practices. Understanding the level of knowledge, attitudes towards screening and vaccination, and health-seeking behaviors among nursing students is essential for identifying gaps and designing effective educational interventions. Nursing students are at a unique juncture in their careers where their awareness and attitudes toward cervical cancer can significantly impact their future practice and the health of their patients.

This study aimed to explore these dimensions among nursing students in Rajshahi, Bangladesh, to better understand the factors influencing their knowledge and attitudes towards cervical cancer. The findings are expected to inform strategies for improving cancer prevention and educational programs within the nursing community.

Materials and Methods:

This cross-sectional study was conducted from January to June 2024 in Rajshahi City, targeting female nursing students aged 18–25 years. Using a multistage random sampling technique, 150 students were selected from three randomly chosen nursing institutions. Within each institution, stratified sampling ensured a proportional representation of students from both diploma and bachelor's degree programs, selecting 50 students per institution.Data were gathered using a structured, pre-tested questionnaire administered in person by trained data collectors. The questionnaire covered socio-demographic characteristics, knowledge about cervical carcinoma, attitudes toward screening and vaccination, health-seeking behavior, and perceived risk factors.Statistical analysis was performed using SPSS version 26.0. Descriptive statistics summarized the data on socio-demographic characteristics, knowledge, attitudes, and health-seeking behaviors. Chi-square tests were used to evaluate associations between categorical variables. Logistic regression analysis was conducted to identify factors significantly associated with higher knowledge levels and positive attitudes toward cervical cancer prevention, with a significance level set at $p < 0.05$.

Results:

Table-I provides an overview of the socio-demographic characteristics of the study participants. The majority were aged 21-23 years and enrolled in diploma programs. Most participants were unmarried, and a small proportion reported a family history of cancer.

Table-I: Socio-Demographic Characteristics of Participants (n=150)

Variable	n (%)
Age (years)	
18-20	60(40%)
21-23	70(46.7%)
24-25	20(13.3%)
Educational Level	
Diploma	90(60%)
Bachelor's	60(40%)
Marital Status	
Unmarried	125(83.3%)
Married	25(16.7%)
Family History of Cancer	
Yes	20(13.3%)
No	130(86.7%)

Table-II shows the participants' knowledge of cervical carcinoma. A majority 60% had good knowledge and were aware of the HPV vaccine. Knowledge about specific risk factors, such as early sexual activity 53.3% and family history 33.3% of cancer, was present among more than half of the participants.

Table-II: Knowledge about Cervical Carcinoma (n=150)

Variable	n (%)
Knowledge Level	
Good Knowledge	90(60%)
Poor Knowledge	60(40%)
Awareness of the HPV Vaccine	
Yes	100(66.7%)
No	50(33.3%)
Knowledge of Risk Factors	
Early Sexual Activity	80(53.3%)
Family History of Cancer	50(33.3%)

Table-III presents the attitudes of nursing students toward cervical cancer prevention. Most participants, 73.3%, exhibited a positive attitude toward screening, and 60 % expressed willingness to receive the HPV vaccine, though a notable percentage remained hesitant.

Table-III: Attitudes towards Screening and Vaccination (n=150)

Variable	n (%)
Attitude towards Screening	
Positive Attitude	110(73.3%)
Hesitant towards Screening	40(26.7%)
Willingness to Receive HPV Vaccine	
Yes	90(60%)
No	60(40%)

Table-IV highlights the participants' health-seeking behaviors. About one-third, 33.3%, had undergone a Pap smear, and nearly half had visited a healthcare provider for reproductive health issues in the past year. A smaller proportion, 26.7%, reported self-medication for symptoms.

Table-IV: Health-Seeking Behavior (n=150)

Variable	n (%)
Underwent Pap Smear	50(33.3%)
Visited Healthcare Provider (last year)	70(46.7%)
Self-Medication for Symptoms	40(26.7%)

Table-V presents the results of the logistic regression analysis examining factors associated with higher levels of knowledge and positive attitudes toward cervical cancer prevention. Students pursuing a bachelor's degree had significantly higher odds (2.5 times) of better knowledge and more favorable attitudes compared to those in diploma programs, with a 95% confidence interval (CI) of 1.5 to 4.2 and a p-value of 0.002. Those with a family history of cancer had 3.1 times higher odds of demonstrating better knowledge and attitudes, with a 95% CI of 1.8 to 5.4 and a p-value of less than 0.001. Exposure to health education about cervical cancer was associated with even greater odds (4.0 times) of improved knowledge and positive attitudes, with a 95% CI of 2.3 to 6.8 and a p-value of less than 0.001.

Table-V: Factors Associated with Knowledge and Attitudes

Variable	Odds Ratio	95% CI	p-value
Educational Level (Bachelor's)	2.5	1.5-4.2	0.002
Family History of Cancer	3.1	1.8-5.4	<0.001
Exposure to Health Education	4.0	2.3-6.8	<0.001

These results underscore the significant impact of educational level, family history of cancer, and health education exposure on enhancing awareness and attitudes toward cervical cancer prevention.

Discussion:

This study explored the knowledge, attitudes, and health-seeking behaviors related to cervical cancer among nursing students in Rajshahi, Bangladesh. The findings revealed several key insights into the understanding and preventive practices concerning cervical cancer in this population.The results showed that 60% of the participants had good knowledge about cervical cancer, and 73.3% demonstrated a positive attitude towards screening. These findings align with previous studies indicating that health education can significantly improve knowledge and attitudes. For instance, a study conducted in Dhaka reported that exposure to health education was positively associated with better knowledge and attitudes toward cervical cancer prevention[15]. Similarly, another study found that increased awareness and education about cervical cancer were crucial for improving screening rates in Bangladesh[16].

The logistic regression analysis identified several significant predictors of better knowledge and more positive attitudes toward cervical cancer. Exposure to health education was associated with an odds ratio of 4.0(95% CI: 2.3-6.8, $p < 0.001$), indicating that students who received health education were four times more likely to have better knowledge and attitudes. This finding is consistent with research that targeted educational programs could effectively enhance cervical cancer knowledge and screening behaviors[17].

The educational level also played a significant role, with bachelor's degree students having 2.5 times higher odds (95% CI: 1.5-4.2, $p = 0.002$) of possessing better knowledge and positive attitudes compared to those in diploma programs. This suggests that higher educational attainment is linked to improved understanding and perceptions of cervical cancer. The importance of education in shaping health behaviors has been previously reported by Zhang et al. (2022), who found that higher education levels were associated with increased health literacy and preventive practices[17].

Furthermore, having a family history of cancer was associated with 3.1 times higher odds (95% CI: 1.8-5.4, $p < 0.001$) of better knowledge and attitudes. This finding highlights the influence of personal and familial health history on health awareness, supporting the results of a study by Bellinger et al. (2013), which emphasized the role of family history in motivating individuals to engage in preventive health behaviors[18].

The prevalence of good knowledge (60%) in this study is similar to the 62% reported by Saei et al. (2018) in a study of women in rural Bangladesh, suggesting a relatively consistent level of awareness across different regions[6]. However, the higher percentage of positive attitudes towards screening in our study (73.3%) compared to the 55% reported by Hoque et al. (2021) may reflect the effectiveness of recent educational interventions or differences in study populations[8].

Conclusion:

This study highlights the critical role of health education, educational level, and family history in shaping knowledge and attitudes toward cervical cancer among nursing students in Rajshahi. The results underscore the need for continued and enhanced educational programs to improve awareness and preventive practices. By addressing gaps in knowledge and attitudes, particularly through targeted health education, it is possible to increase the uptake of cervical cancer screening and vaccination, thereby reducing the incidence and mortality associated with this preventable disease. Future research should focus on evaluating the impact of specific educational interventions and exploring barriers to screening uptake in different populations to further refine.

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Original Article

Approach of Conservative Expectant Management in Patient with Intestinal Obstruction

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Abstract

Background: *Intestinal obstruction continues to be a common surgical emergency throughout the world and its management protocol has evolved over years. In this study we aimed to provide a complete epidemiological description of intestinal obstruction in adult age group patients in a tertiary care hospital in North Bengal.*

Materials and Methods: *This is a prospective study of patients belonging to age group more than 12 years admitted in our unit with clinical features suggestive of intestinal obstruction from September 2023 to September 2024 at Rangpur Community Medical College Hospital (RCMCH), Rangpur. The study comprised of 134 patients.*

Results: *Intestinal obstruction contributed to 6.5% of all surgical admissions. It was nearly twice more common in males. 43% patients presented with features of acute intestinal obstruction in comparison to 57% who presented with features of sub-acute intestinal obstruction. Most common cause observed was obstruction due to intra-abdominal adhesions followed by abdominal tuberculosis 48 and 29 percent respectively. Features of intestinal obstruction resolved in 60% patients with conservative management. Adhesions, abdominal tuberculosis and malignancy counted for majority of patients with sub-acute obstruction. Emergency surgery was done in 32% of patients and 36.5 % of patients were discharged non-operatively. Planned Surgery after successful expectant management was done in 24% patients. Most frequently seen complication was wound site collection (72.5%) followed by respiratory tract infections (49%). Total mortality in our study was 12.6% of which 41% was post-operative mortality and 59% mortality seen in patients who expired during conservative management.*

Conclusions: *This study demonstrates that intra-abdominal adhesions and abdominal tuberculosis account for most cases of intestinal obstruction in countries like Bangladesh. A watchful expectant management can be tried in patients with prior operative history and those with history of tuberculosis.*

Keywords: *Acute obstruction, sub-acute obstruction, Conservative management of obstruction, surgical management of intestinal obstruction.*

Introduction:

Intestinal obstruction occurs when there is an interruption in the forward flow of intestinal contents which can either occur in presence or absence of mechanical obstruction[1]. This interruption can occur at any point along the length of the gastrointestinal tract with peristalsis being either present or absent and even so inadequate.These interruptions can occur as result of variety causes. Broadly dynamic causes include fecal impaction, foreign bodies, bezoars, gallstones, strictures, malignancy, intussusception, volvulus, bands and hernia[2]. Whereas the adynamic causes includes paralytic ileus and pseudo-obstruction which occurs when there is failure in the motility of the intestines without any structural obstruction. All these conditions disrupt the passage of digested food and leads to clinical symptoms which often vary based on the location and duration of obstruction along with the underlying pathology[3]. The incidence of small bowel obstruction (SBO) varies between 0.1% and 5% in patients who have not undergone previous surgery, yet may rise to over 60% in patients who have undergone previous surgery. Intestinal obstruction is most commonly caused by intra-abdominal adhesions, followed by intestinal herniation and malignancy[4]. The clinical presentation generally includes nausea and emesis, colicky abdominal pain, and a failure to pass flatus or bowel movements[5]. The classic physical examination findings of abdominal distension, tympany to percussion, andhigh-pitched bowel sounds suggest

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the diagnosis[6]. The nature of the presentation will also be influenced by whether the obstruction is complete or incomplete. A complete small bowel obstruction has all the cardinal features[7]. Some late manifestations of intestinal obstruction include dehydration, oliguria, hypovolemic shock, pyrexia, septicemia and peritonism[8]. In some instances of complete large bowel obstruction there may be lack of preceding symptoms[9]. In case of high small bowel obstruction, vomiting occurs early which is profuse and leads to rapid dehydration with a minimal distention on abdominal radiography[10]. In case of, low small bowel obstruction, pain the predominant feature with central distention where vomiting occurs late and on radiography multiple dilated bowel loops are seen[11]. In case of large bowel obstruction, there's a prominent distention which occurs early on whereas vomiting and dehydration are seen late[12]. Radiologic imaging can confirm the diagnosis and can also serve as useful adjunctive investigation when the diagnosis is less certain[13]. Incomplete obstruction is also referred to as partial or sub-acuteobstruction[14]. Although radiography is often the initial study, non-contrast computed tomography is recommended if the index of suspicion is high or if suspicion persists despite negativeradiography[15]. Management of uncomplicated obstructions includes fluid resuscitation with correction of metabolic derangements, intestinal decompression, and bowel rest[16]. Evidence of vascular compromise or perforation, or failure to resolve with adequate bowel decompression is an indicationfor surgical intervention[17].

Materials and Methods:

We did a prospective study on 134 patients presenting with clinical features of intestinal obstruction in our unit at RCMCH, Rangpur during the period of September 2023 to September 2024.All patients including those subjected to non-operative intervention were closely reviewed in a place of close observation, proper monitoring was done including recording of vitals at regular intervals, serial laboratory investigations and imaging studies as required and/or indicated.Precise history was recorded with a thorough clinical examination particularly abdominal examination to look for abdominal tenderness, signs reflecting peritonism, serial abdominal girth measurement, per rectal examination and auscultation which was supplemented with plain abdominal radiograph to look for multiple air fluid levels and distended bowel loops. All patients had routine blood investigations and further imaging studies were done in selected patients. Patients who left against medical advice before completion of treatment were excluded from study. Operative findings and procedure notes were recorded in detail. Every note on post-operative complications and mortality were made.

Results:

Incidence of 1200 patients admitted in single surgical unit from September 2023 to September 2024, intestinal obstruction was diagnosed in 134 patients (6.5%).

Age and gender distribution

Intestinal obstruction was seen in 89 (66.4%) males in comparison to 45 (33.6%) female patients. Most common age group involved was 31 to 50 years (42%) with mean age of 44±17 years was observed. Age wise distribution is shown in Table-I.

Table-I: Age wise distribution of patients with intestinal obstruction

Age range in years	Age wise distribution	Percentage
12 to 20	12	9.0
21 to 30	24	17.9
31 to 40	28	20.9
41 to 50	28	20.9
51 to 60	18	13.4
61 to 70	16	11.9
71 to 80	5	3.7
81 to 90	3	2.2

The causes of intestinal obstruction observed in our study are depicted in table II. Adhesions were seen as the most common cause (48 patients: 35.8%) followed by abdominal tuberculosis (29 patients: 21.6%). Aetiology observed is shown in Table-II.

Table-II: Aetiology of intestinal obstruction observed

Aetiology	Number of patients	Percentage
Adhesion	48	35.8
Tuberculosis	29	21.6
Hernia	10	7.5
Malignancy	13	9.7
Volvulus	5	3.7
Meckel's Diverticulum	5	3.7
Appendicitis	5	3.7
Jejunal Stricture	3	2.2
Adynamic Obstruction	3	2.2
Pancreatitis	1	0.7
Intussusception	1	0.7
Mesenteric Ischemia	1	0.7
Undiagnosed	10	7.5

Patients were either subjected directly to emergency surgery (24 patients; 17.9%) or a trial of expectant management was given criteria for subjecting patients to emergency surgery included pain and distension with obvious cause of intestinal obstruction, features of peritonism, tachycardia and other features of toxicity like fever and leukocytosis and failure of non-operative treatment. Patients in whom expectant management succeeded (81 patients; 60%) were either discharged after non-operative management (49 patients; 36.5%) or operated in elective setting (32 patients; 24%). Among those in whom expectant management failed delayed emergency surgery was done (19 patients; 14%).

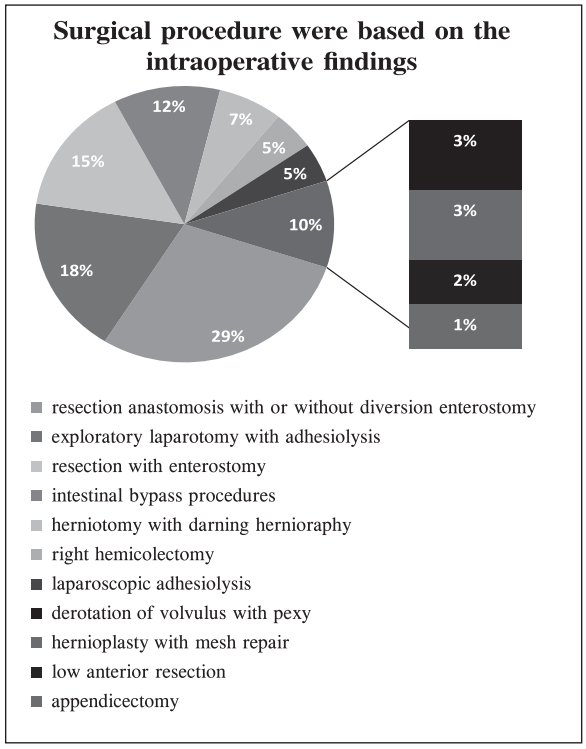

Figure-1: Surgical procedure were based on the intraoperative findings

Complication of expectant management were seen in patients in whom expectantmanagement failed and delayed emergency surgery was advocated. Expectant management failed in 29 cases out of which 10 patients died without operative intervention. Delayed emergency surgery was done in 19 cases. In such patient's intestinal gangrene was present in 7 (37%). Bowel perforation was present in 5 cases (26%) and 3 patients expired (16%).

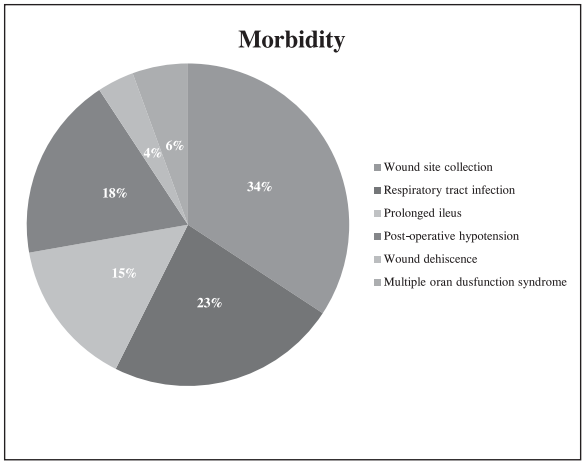

Figure-2: Morbidity pattern

Major post-surgical complications included wound site collection (72.5%), respiratory tract infections (49%), prolonged ileus (31.4%), post-operative hypotension (39.2%), Wound dehiscence (7.8%) and multipleorgandysfunction syndrome (MODS) (11.8%). Post-operative complications were found more in patients who presented with acute obstruction (52%) than sub-acute obstruction (28%). This can be attributed to the fact that more patients with acute obstruction underwent emergency surgeries. Respiratory tract infections were more in the elderly. Post operative shock and MODS were present in patients with overt sepsis and poor general condition at the time of presentation.

There were 17 mortalities during this study. There were 7 deaths after surgery and 10 patients expired during expectant management. Nine Patients were of acute obstruction i.e., (53%) and 8 (47%) were of sub-acute obstruction. 16 out of these 17 patients were hemodynamically unstable at the time of presentation (99%). Six patients had history of pulmonary tuberculosis and 2 had chest x-ray features suggestive of active tuberculosis. Age wise incidence depicts two peaks one in age group of 31 to 40 years and another in 51 to 60 years. All operative mortalities occurred after emergency surgeries and no mortality was in patients with planned surgery. Intestinal gangrene was present in 4 out of 7 operated patients (57%). Increasing trend in mortality was seen with increasing duration of illness and delay in presentation. Minimum mortality, i.e., 5.8% was seen in patient with less than 2 days of onset of disease, whereas 47% of total mortality corresponded to patients with history of more than 7 days.

Discussion:

Intestinal obstruction is one of the most common causes for surgical admission since centuries however the etiology has changed over period of time. Obstructed hernia used to be the commonest cause in 90's which has now decreased owing elective hernia repair surgeries. In the present study intra-abdominal adhesions were attributed to the commonest cause which is comparable to studies done in recent years. Gender wise distribution has also changed over years.[10,11] Present study shows ratio of male: female as 2:1 which is not comparable to previous studies.[12,13] This can be attributed to changing trends and more female attending hospital services. A critical factor in managing these patients is to determine whether patients can be subjected to expectant treatment or to emergency surgery.[14]
Expectant conservative approach was successful in 81 patients (60%), which is nearly comparable to previous studies.[15,16] Expectant management was more successful in patients with sub-acute obstruction (58 versus 23 patients; 52% versus 28%). Moreover, patients with suspected adhesions and abdominal tuberculosis responded successfully to expectant management (76% and 65% respectively). All patients with diagnosed acute appendicitis as cause of intestinal obstruction responded positively to expectant management. Upon analysis of expectant management out of 110 patients, 49 patients (44.5%) were discharged non-operatively, 19 required emergency surgery (17.3%) from which 3 patients expired post operatively (2.7%), 32 patients were taken up for planned surgery (29%) and 10 patients (9%) expired without surgery.

Conclusion:

In this study states that adhesions are now major cause for intestinal obstruction than obstructed hernia. Intestinal tuberculosis still presents as a big problem to the community. Lastly, conservative expectant management can be tried in patients with previous history abdominal operation, previous history of tuberculosis and in those in whom no signs of high-grade intestinal obstruction is present.

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