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Epidemiological and Clinical Characteristics of Inguinal Hernia Patients at a Tertiary Care Hospital

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Abstract

Background: Inguinal hernias, the most common abdominal wall hernias, occur when abdominal contents protrude through the inguinal canal due to abdominal wall weakness. They account for 75% of all abdominal wall hernias, with indirect inguinal hernias being more common than direct ones. Risk factors include congenital conditions, increased intra-abdominal pressure, age, and smoking. **Aim:** This study aims to assess the different clinical characteristics and patterns of presentation of inguinal hernia in the adult population. **Methods:** This prospective study included 85 patients with primary inguinal hernia admitted at the Department of Surgery, Khulna Medical College Hospital, Khulna, Bangladesh, between January 2020 to December 2023. Patients were selected using purposive sampling and were assessed for fitness for surgery through routine tests. Exclusion criteria included infants, recurrent hernias, laparoscopic treatments, and certain medical conditions. Surgery was performed under spinal anesthesia using 3 ml of bupivacaine 2%. Ethical approval was obtained, and informed consent was taken. Data were collected on demographics, clinical details, and risk factors, and analyzed using SPSS to summarize categorical variables with frequencies and percentages. **Results:** A total of 89.41% were male, with 40% above 50 years old. Most patients were engaged in business (52.94%), and 61.18% were from lower socioeconomic backgrounds. All patients had groin swelling, with common symptoms including groin pain (63.53%) and heaviness (61.18%). Hernia types were predominantly right-direct (32.94%) and left-direct (27.06%). Risk factors included smoking (25.88%), weight lifting (21.18%), and prostatism (18.82%). The majority of hernias were reducible (81.18%) and incomplete (77.65%).
Conclusion: Inguinal hernias primarily affect males over 50, with direct hernias being more prevalent. Delayed symptom presentation, influenced by socio-economic and healthcare access issues, highlights the need for public awareness and early intervention. Key risk factors include smoking, heavy lifting, and ageing, consistent with global trends.

Keywords: Inguinal hernia, Clinical characteristics, Risk factors.

Introduction

A hernia is defined as the protrusion of an organ or tissue through an opening in the muscle or tissue that ordinarily contains it. Inguinal hernias, a subtype of abdominal wall hernias, occur when abdominal contents protrude through the inguinal canal due to weakness or defects in the abdominal wall. This condition is one of the most commonly encountered surgical challenges, accounting for approximately 75% of all abdominal wall hernias globally. Among groin hernias, 95% are inguinal hernias, with the remainder being femoral hernias.[1]

Inguinal hernias can be categorized as direct or indirect based on their anatomical relation to the inferior epigastric vessels. Indirect hernias, the more prevalent type, pass lateral to the vessels and through the inguinal canal. Direct hernias, in contrast, protrude medially through a weakened posterior wall of the inguinal canal, often developing over time and typically occurring in patients over 40 years old.[2,3] Internationally, inguinal hernia repair is one of the most frequently performed elective surgeries, with over 20 million procedures conducted annually.

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Lifetime prevalence rates for groin hernias range from 27% to 43% in men and 3% to 6% in women.[4,5] Patients often present with larger hernias, longer symptom durations, and more frequent emergencies compared to their counterparts in developed nations.[6] The clinical presentation of inguinal hernias varies, with symptoms typically including a groin bulge that becomes more pronounced with standing, coughing, or straining. Patients may also report discomfort, pain, or a sensation of heaviness in the groin.[7] Complications such as irreducibility, intestinal obstruction, and strangulation may require urgent surgical intervention.[8,9] Risk factors for inguinal hernias are multifactorial and include both predisposing and precipitating factors. Predisposing factors involve congenital conditions such as a patent processus vaginalis, while precipitating factors include increased intra-abdominal pressure from chronic cough, constipation, pregnancy, and heavy lifting.[10,11] Additionally, smoking, advancing age, pelvic fractures and trauma, connective tissue disease, and systemic illnesses have been identified as significant contributors to hernia development.[7] Interestingly, studies have found a paradoxical decrease in inguinal hernia incidence among overweight and obese patients, contrary to expectations.[12,13]

Inguinal hernia repair techniques have evolved significantly, with tension-free mesh repairs being the gold standard due to reduced recurrence rates and faster recovery times. Both open and laparoscopic approaches are employed, with the choice depending on patient factors and surgical expertise.[14] Postoperative care, including adequate pain management, is integral to optimizing outcomes and minimizing complications.[15]

Despite the high prevalence and significant morbidity associated with inguinal hernias, there still needs to be large-scale epidemiological studies in many low and middle-income countries. This study aims to assess the different clinical characteristics and patterns of presentation of inguinal hernia in the adult population.

Materials and methods

The present study was a prospective study of 85 cases of inguinal hernia selected on the basis of the non-probability (purposive) sampling method conducted from the patients admitted with the diagnosis of inguinal hernia at the Department of Surgery, Khulna Medical College Hospital, Khulna, Bangladesh. From January 2020 to December 2024, this prospective study was conducted. The diagnosis of primary inguinal hernia was made based on the history of reducible groin swelling and essentially on clinical examination. Selected participants were needed to meet all the inclusion and exclusion criteria, which are given below:

Inclusion Criteria

- Patients aged 20 to 65 years with direct and indirect inguinal hernias
- Uncomplicated hernias
- Patients who gave consent for the procedure

Exclusion Criteria

- Infants with inguinal hernias
- Recurrent hernias
- Hernias treated with the laparoscopic method
- Presence of bowel obstruction, strangulation, peritonitis, or perforation
- Associated femoral hernia
- Patients who are undergoing orchidectomy in the same procedure

Only those investigations were done that were relevant to obtaining fitness for surgery. This included random blood sugar, blood urea, serum creatinine, ECG, haemoglobin percentage, and routine urine analysis for sugar, albumin, microscopy, chest X-ray, and abdominal ultrasound. If any patient was found to have any medical contraindication for surgery, he was first treated for these medical problems and then reevaluated for surgery. All cases were done under Spinal anesthesia using 3 ml of bupivacaine 2%.

Data Collection

The Institutional Review Board obtained ethical approval, and written informed consent was obtained from all participants. Necessary particulars regarding relevant history, demographic facts, risk factors, clinical data, and examination findings were recorded in a questionnaire and tabulated. The outcome of surgery was not a parameter of assessment.

Statistical Analysis

The data collected during the study were systematically organized and displayed using appropriately selected tables and graphs. A detailed description accompanied each table and graph to ensure clarity and facilitate comprehension of the results. Statistical analyses were carried out using the Statistical Package for the Social Sciences (SPSS) software on a Windows operating system. Categorical variables were summarized using frequencies and percentages to highlight their distribution within the dataset.

Results

The study analyzed the clinical characteristics of 85 inguinal hernia patients. The majority of patients (40%) were above 50 years old, with the 21–30 and 41–50 age groups each comprising 20%. Most patients were male (89.41%), with

only 10.59% being female. Regarding occupation, over half were engaged in business (52.94%), followed by those in services (25.88%). 61.18% belonged to the lower class, 23.53% to the middle class, and 15.29% to the higher class in terms of economic status (Table 01). All (100%) had groin swelling, with groin pain (63.53%) and heaviness (61.18%) being common. Burning sensation (56.47%), scrotal swelling (29.41%), obstruction (7.06%), and strangulation (3.53%) were less frequent (Table 02). 41.18% experienced symptoms for over 12 months, while 28.24% reported 1–3 months. Symptoms lasting 6–12 months were noted in 17.65% of cases, and 12.94% had symptoms for 3–6 months (Table 03).

Figure 01 shows that over half (54.12%) of the patients had a mild pre-operative pain score VAS. In the clinical examination, the most common types of hernia were right direct (32.94%) and left direct (27.06%), followed by left indirect (21.18%) and right indirect (11.76%). Pantaloon hernias were less frequent. Most hernias were reducible (81.18%). Regarding completeness, 77.65% were incomplete (Table 04). Several associated factors influenced the disease. 45.88% of patients were aged over 50 years. Smoking was reported by 25.88% of patients, while 21.18% had a history of weight lifting. Prostatism and constipation were observed in 18.82% and 16.47% of patients, respectively. Other associated factors included family history (4.71%), obesity (7.06%), chronic cough (7.06%), and other factors (5.88%) (Table 05).

Table 01: Socio-demographic characteristics of the study population (n=85)

Parameters	Frequency (n)	Percentage (%)
Age (years)		
20	6	7.06
21-30	17	20.00
31-40	11	12.94
41-50	17	20.00
above 50	34	40.00
Gender		
Male	76	89.41
Female	9	10.59
Occupation		
Services	22	25.88
Business	45	52.94
Students	6	7.06
Others	12	14.12
Economic Status		
Lower-class	52	61.18
Middle-class	20	23.53
Higher-class	13	15.29

Table 02: Presented symptoms among patients (n=85)

Symptoms	Frequency (n)	Percentage (%)
Groin pain	54	63.53
Swelling in the groin	85	100.00
Swelling in the scrotum	25	29.41
Sensation of heaviness in the groin	52	61.18
Burning sensation in the groin	48	56.47
Features of obstruction	6	7.06
Features of strangulation	3	3.53

Table 03: Duration of the symptoms among patients (n=85)

Duration of symptoms	Frequency (n)	Percentage (%)
1-3 months	24	28.24
3-6 months	11	12.94
6-12 months	15	17.65
>12 months	35	41.18

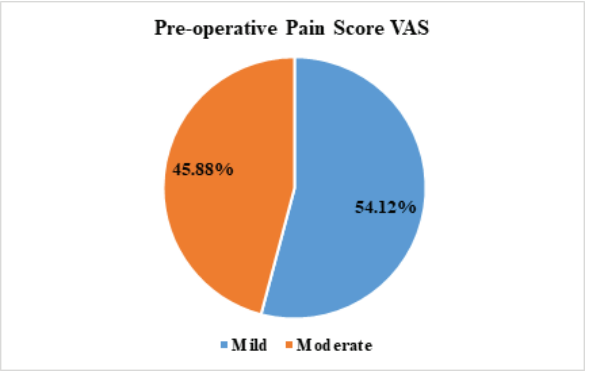

Figure 01: Pre-operative Pain Score VAS (Visual Analog Scale) of the patients

Table 04: Clinical examination in our study population (n=85)

Parameters	Frequency (n)	Percentage (%)
Type of Hernia		
Right direct	28	32.94
Right indirect	10	11.76
Right pantaloon	4	4.71
Left direct	23	27.06
Left indirect	18	21.18
Left Pantaloon	2	2.35
Reducibility		
Reducible	69	81.18
Irreducible	16	18.82
Complete or incomplete		
Complete	19	22.35
Incomplete	66	77.65

Table 05: Associated factors in the present study (n=85)

Associated factors	Frequency (n)	Percentage (%)
Age >50 years	39	45.88
Smoking	22	25.88
Family History	4	4.71
H/O weight lifting	18	21.18
Prostatism	16	18.82
Constipation	14	16.47
Obesity	6	7.06
Chronic cough	6	7.06
Others	5	5.88

Discussion

This study provides a comprehensive overview of the clinical characteristics, symptomatology, and associated factors of inguinal hernia patients treated at a tertiary care hospital in Bangladesh. The findings highlight critical demographic and clinical patterns, offering insights into the burden and presentation of inguinal hernias in a low-resource setting. One of the important factors responsible for the undesirable outcomes of patients with incarcerated groin hernia is advanced age. In this study, most patients (40%) were above 50 years, a known risk factor due to weakened abdominal musculature with ageing. According to a study by Basu et al., the greatest incidence of inguinal hernia occurred between the ages of 42 and 57 years.[16] Our results coincide with other studies.[1,17] The study population was predominantly male (89.41%), consistent with global trends, as men are biologically predisposed to hernias due to the anatomy of the inguinal canal. Sirigireddy et al. and Kabir et al. also exhibited similar findings.[7,18]

Symptomatically, all patients reported groin swelling, which remains the hallmark of inguinal hernias. Pain and a sensation of heaviness, present in over 60% of patients, align with typical clinical presentations, while less common symptoms like burning sensations (56.47%) and scrotal swelling (29.41%) reflect the variability in disease expression. Severe complications such as obstruction (7.06%) and strangulation (3.53%) highlight the importance of timely diagnosis and intervention to prevent life-threatening outcomes. The presenting symptoms among patients in this study are comparable with the study of Sirigireddy et al., Rahman et al., and Pradhan et al.[7,19,20] The duration of symptoms revealed that 41.18% of patients experienced symptoms for over 12 months, suggesting delayed healthcare-seeking behaviour, which is often influenced by socioeconomic barriers and limited access to specialized care. In our study, most of the patients with inguinal hernia presented late to healthcare providers, which is similar to the scenario in other developing countries.[21-23]

There was little difference between the mild and moderate pre-operative pain score VAS, which is similar to another study.[20] Our study found that left-side involvement (50.59% total) was slightly more dominant than the right side (49.41% total). Clinical examination findings revealed that direct hernias were more prevalent, with right and left direct hernias accounting for 32.94% and 27.06% of cases, respectively. The present study correlated well with Burcharth et al.[24] This differs from global data, where indirect hernias typically dominate, potentially reflecting environmental or genetic factors specific to the studied population.[7,25,26] The high proportion of reducible (81.18%) and incomplete (77.65%) hernias suggests that many cases are presented at a stage amenable to elective repair, emphasizing the need for awareness campaigns to encourage early intervention and reduce the risk of complications.

The study also identified significant associated factors contributing to inguinal hernia development. Age over 50 years (45.88%), smoking (25.88%), and heavy lifting (21.18%) were the most notable, consistent with established risk factors that increase intra-abdominal pressure or weaken abdominal wall structures. A study in the USA conducted by Constance et al. found that the inguinal hernia was associated with older age, chronic cough, obesity, greater height, and rural residence.[13] Smoking was established as an independent risk factor for hernia development, with Malviya et al. reporting 30.6% in their study.[22] The prevalence of prostatism (18.82%) and constipation (16.47%) highlights their role in creating chronic straining conditions, a key precipitating factor for hernia formation. Our findings correlate with the study of Kour et al.[27] and some other studies.[23,28] Interestingly, obesity and chronic cough, though well-documented contributors in the literature, were less prevalent (7.06% each) in this study. The low prevalence of family history (4.71%) suggests a lesser role for congenital factors in this cohort compared to other populations. Family history, however, appears to be an independent risk factor in etiopathogenesis.[29] The other risk factors suggested were chronic cough, Prostatic hypertrophy, chronic constipation, and diabetes [17,30,31]

Limitations of the study:

• Exclusion of certain patient groups, such as recurrent hernias or those treated laparoscopically, restricts the scope of findings.

• Lack of follow-up data on postoperative outcomes and complications.
• Potential recall bias in self-reported risk factors and symptom durations.

Conclusion

This study highlights the clinical characteristics of inguinal hernia patients treated at a tertiary care hospital in Bangladesh. The findings reveal that inguinal hernias are predominantly seen in males over 50 years old, with direct hernias being more common in this population. The delayed presentation of symptoms, influenced by socio-economic and healthcare access barriers, underscores the need for public awareness and early intervention to prevent complications. Significant risk factors include smoking, heavy lifting, and advancing age, which align with global trends. This study emphasizes the importance of timely diagnosis and elective surgical repair to optimize outcomes and minimize morbidity.

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