International Journal of Pharmacy and Pharmaceutical Research (IJPPR)
Volume 31, Issue 4, April 2025 **ijppr.humanjournals.com** ISSN: 2349-7203

Demographics, Clinical Profile and Risk Factors of Inguinal Hernia: A Prospective Observational Study

Ramya S [1*], Abinath M [2], Dr.Junior Sundresh N[3], Dr.Dhanapal C K [4]

1*Corresponding Author Pharm.D Intern, Annamalai University, Chidhambaram, Tamil Nadu. India.

2 Pharm.D Intern, Annamalai University, Chidhambaram, Tamil Nadu. India.

3 M.B.B.S., MS, FRCS, FACS, Ph.D, Professor, Government Cuddalore Medical College and Hospital, Chidambaram, Tamil Nadu. India.

4 M. Pharm., Ph.D, Professor, Department of Pharmacy, FEAT, Annamalai University, Chidambaram, Tamil Nadu. India.

Received: 2025-4-01 Revised: 2025-4-12 Accepted: 2025-4-20

ABSTRACT:

Background: The most prevalent elective surgery in India is the correction of inguinal hernias, which consumes a substantial amount of healthcare resources. This study was conducted to look into the demographics, clinical profile and risk factors of inguinal hernia. **Method**: This study was conducted as an observational study at the tertiary care centre of southern India, including 72 patients who had admitted to the surgical inpatient department for inguinal hernia treatment.All participants' informed consent was obtained before the clinical examination, history, and demographic information were documented. This study was observational, prospective, single-centre, and non-randomized.**Results and discussion**: In our study, 36 patients (50%) were between 41-60 years of age. Seventy patients (97.22%) were males, and two (2.78%) were females. Male: Female ratio was 35:1. Males were more prevalent because they engaged in more demanding activities, lifting heavy weights, and had different anatomy. In this study, lifting heavy weights was the primary risk factor (72.22%), followed by the respiratory problems (chronic obstructive lung disease)(38.88%).Diabetes, alcohol consumption, and smoking were also linked to an increased risk of hernias. According to this study, the right side hernia was the most common (41.67%), followed by the left (33.33%). The most prevalent kind was an indirect hernia(58.33%). **Conclusion**: An inguinal hernia is a surgical condition that frequently affects middle aged men. Inguinal hernias on the right side are prevalent, with the indirect type occurring more frequently. Intense weightlifting is often identified as risk factors.

Keywords: inguinal hernia, middle aged men, heavy weight, indirect, swelling, abdominal pain.

INTRODUCTION:

In India, the most common elective surgery is treatment of inguinal hernias.15% to 20% of the overall population suffers from a hernia. An estimated 1.5 to 2 million people in India are thought to have an inguinal hernia [1]. Men are more likely than women to suffer from inguinal hernias. Men undergo over 90% of inguinal hernia repair, while women undergo 70% of femoral hernia repair. Men are predicted to have a lifetime risk of 27% of inguinal hernias, whereas women's risk is 3% [2].Age-dependent inguinal hernia's prevalence in men is characterized by a bimodal distribution curve, with the first peak occurring in the first year of life and the second peak occurring after the fourth decade [3,4]. Inguinal hernias are five times more common in women than femoral hernias, despite the fact that femoral hernias are more common in women overall.

The indirect inguinal hernia is the most prevalent kind of groin hernia in both sexes. In men, there is a 2:1 ratio between indirect and direct hernias [4,5].

The traditional classification of hernias is indirect, direct, and femoral, depending on how the hernia and surrounding structures relate to each other. In Hesselbach's triangle, direct hernias protrude toward the midline, medial to the inferior epigastric vessels. Furthermore, indirect hernias are those that extend lateral to inferior epigastric veins via the deep ring. Femoral hernias appear as a

protrusion lateral to the pubic tubercle and protrude through the femoral ring. The most widely used hernia categories are the Nyhus classification of groin hernia, the European Hernia Society's groin hernia classification, and Zollinger's unified classification of groin hernias. Numerous additional classification schemes have also been developed. An inguinal hernia most commonly manifests as a bulge in the groin that gets bigger when standing and gets smaller or disappears when lying down. Relatively few patients have been linked [4,5].

Adults typically consider inguinal hernias to be acquired, although they can also occur in children and are considered congenital. An important factor in the etiopathogenesis of congenital hernia is the persistence of the patent processus vaginalis (PPV). An inguinal hernia is not caused by the presence of PPV alone. In addition to PPV, other risk factors such as tissue weakness, strenuous activity, and family history increase the likelihood of inguinal hernias [5].

Hereditary, environmental and occupational factors are play a role in the multifactorial aetiology of adult inguinal hernias.In theory, a high-risk factor for an inguinal hernia should have been obesity. However, research has indicated that patients who are overweight or obese had a lower incidence of inguinal hernias. [6,7].

This observational study was conducted at a tertiary care centre in the southern India on inguinal hernia patients admitted to department of surgery.This article aims to explain the demographics, clinical profile and related risk factors of inguinal hernia.

MATERIALS AND METHODS:

The research was carried out as an observational study from September 2024 to February 2025 at a tertiary care centre in the southern India. All participants admitted to the hospital with reports of groin swelling, regardless of pain, were included, and following the acquisition of informed consent, demographic, medical history, and clinical examination information were collected. This was a prospective, single-centre, non-randomized, observational research study. The study received approval from the Institutional Human and Ethics Committee (IHEC) of the tertiary care centre.

Inclusion criteria

All patients diagnosed with an inguinal hernia and admitted to the surgical inpatient department.

Exclusion criteria

Patients with physical or mental conditions, patients with cognitive impairments, and patients who decline to give consent to participate in the study.

Patient information, including name, age, gender, address, socio-economic status, and profession were recorded. A comprehensive history was collected regarding the presenting issue and the background of the current illness. Comorbidities were documented. Patients experiencing groin pain prior to surgery were noted, and their pain was evaluated on a numerical rating scale from 1 to 10 using the visual analog score. Pain is classified into four categories based on the VAS scores as Nil = VAS score 0; Mild = VAS score 1-3; Moderate = VAS score 4-6; Severe = VAS score >6.

RESULTS:

Seventy two patients who admitted to the surgical inpatient department for inguinal hernia treatment were included in the study as per the inclusion and exclusion criteria.

Patient demographics

Age Distribution:

In our research, 36 (50%) patients were aged between 41 and 60, 18 (25%) patients were aged between 21 and 40 years, six (8. 33%) patients were aged between 0-5 years, 6 patients (8. 33%) fell within the 6-20 years range and 6 (8. 33%) patients were aged between 61 and 80 years. The average age was 42±15 years. The ages of the patients in the study group varied from 3/12 years to 74 years. Figure 1 presents a bar graph that depicts age distribution.

International Journal of Pharmacy and Pharmaceutical Research (IJPPR)
Volume 31, Issue 4, April 2025 ijppr.humanjournals.com ISSN: 2349-7203

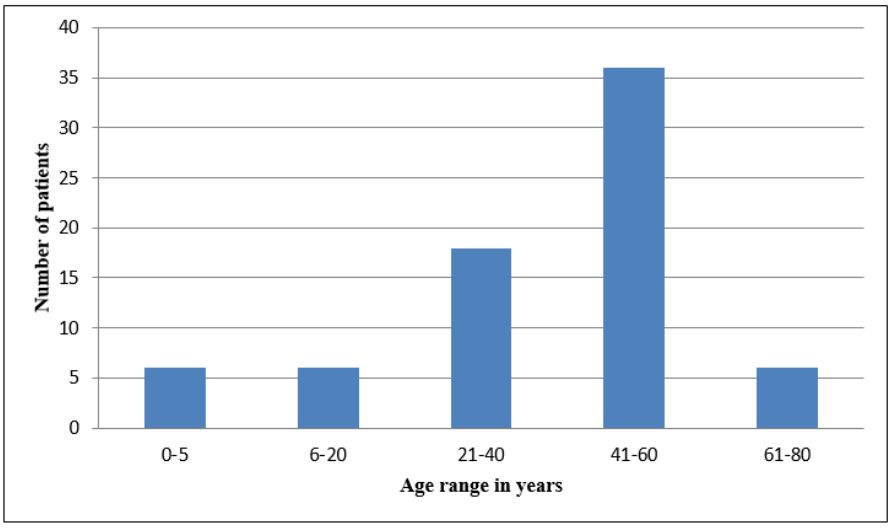

Figure 1

Gender Distribution:

In this present study, seventy (97.22%) patients were males and two (2.78%) patients were females. Male: Female ratio was 35:1.

Table 1

Symptoms	Number of patients	Percentage
Swelling	72	100
Pain with swelling	30	41.66

Occupation:

In this study, 45% were labourers, 17% were farmers by occupation, 14% were shopkeepers/vendors, 8% were students, 8% were homemakers and 8% were officers. Figure 2 is a pie chart showing the occupation-wise distribution of patients in percentage.

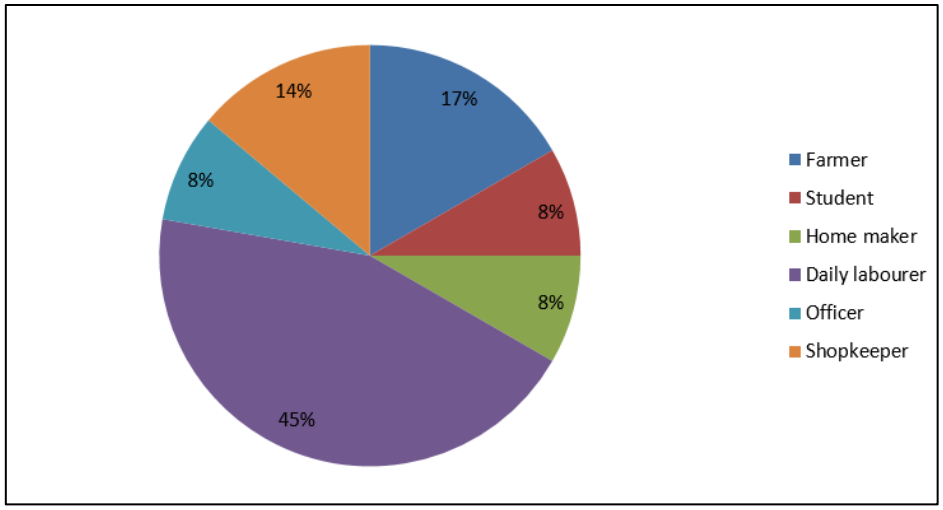

Figure 2

Clinical Profile:

In this study, swelling was the clinical manifestation in every patient. Groin pain accompanied by swelling was observed in 41. 66% of the patients. Table 1 illustrates the clinical presentation of the inguinal hernia.

Pre-Operative Pain VAS Score:

Pre-operative pain VAS (visual analog scale) score was mild in 60% of patients and moderate in 40% of patients with pain.Table 2 presents the number and percentage of individuals in every level of pre-operative pain score VAS.

Table 2

Pre-operative Pain Score VAS (Visual Analog Scale)	Number of patients	Percentage
Mild	18	60
Moderate	12	40
Total	30	100

Hernia Characteristics:

The most common side of hernia was on the right side in 30 patients (41.67%), on the left in 24 patients (33.33%) and bilateral in 18 (25%) patients. Table 3 shows the number of patients and their percentage for each side of inguinal hernia.

Table 3

Side of Hernia	Number of patients	Percentage
Right	30	41.67
Left	24	33.33
Bilateral	18	25

Type of Hernia:

The most common type of hernia was indirect hernia in 42 (58.33%) patients, followed by a direct hernia in 18 (25%) and combination of direct and indirect hernia in 12 (16.67%) patients. Table 4 shows the number of patients and their percentage for each type of hernia.

Table 4

Type of hernia	Number of patients	Percentage
Indirect	42	58.33
Direct	18	25
Both	12	16.67

Risk Factors:

The most common cause for the presence of hernia was lifting heavy weights in 52 (72.22%) patients and altered bowel movements; most of them had constipation, seen in 25(34.72%) patients. Twenty six (36.11%) had diabetes, and 28 (38.88%) had respiratory problems, mainly chronic obstructive pulmonary disease. Thirty nine (54.16%) patients were alcoholics, and 46(63.88%) of them were smokers.

Discussion:

The study was observational and conducted at a tertiary care centre in Southern India.72patients were included in the study as per inclusion and exclusion criteria. After acquiring informed consent from all the participants, their clinical and demographic information and history were collected.

In our study, 36 (50%) were between 41 and 60, 18(25%) patients were between 21 and 40 years of age, six (8.33%) patients were between 0-5 years of age, 6 patients (8.33%) were between 6-20 years and 6 (8.33%) patients were between 61 and 80 years of age. The mean age was 42±15 years.

This aligned with a study by de Goede B, in which individuals aged around and above 50 were the most impacted age group [6]. Comparable findings were also reached by the research done by Ruhl CE, indicating that the hernia was more prevalent in middle aged men 40-59 years [7]. Additionally, similar outcomes were demonstrated by Sayanna and Basu [8,9], where the hernia was more frequent in individuals over the age of 50.

In the current research, 70 patients (97. 22%) were male, while two patients (2. 78%) were female. The Male to Female ratio was 35:1. The dominance of males over females was noted in other research as well, such as Burcharth J, whose study found that the gender distribution of inguinal hernias were 90. 2% male and 9. 8% female, aligning with the findings of the current study [10]. Ruhl et al. also documented comparable results [7]. Lau H et al. similarly indicated that males have a higher likelihood of developing hernias [11].

The pathophysiology of a hernia is founded on the idea of elevated abdominal pressure (mechanical effect) impacting a vulnerable abdominal wall [12]. In the current study, the primary risk factor identified was heavy weight lifting and strenuous labor in 72. 22%, followed by changes in bowel habits in 34.72%. Smoking, alcohol consumption, respiratory issues, and diabetes were also associated risk factors linked to the hernia. Likewise, in their research, Sharma found that 52. 4% of patients developed hernias from lifting heavy objects [12]. Additionally, in studies carried out by Constance Erin and Kumar, a similar correlation of risk factors was noted [7,13,14].

The type of hernia most frequently observed in this study was indirect, affecting 58. 33% of patients, followed by direct hernia in 25%, and 16. 67% of patients had both types. Furthermore, in this study, the predominant side for hernias was the right side, which accounted for 41.67%; on the left side, it was 33. 33%, and bilateral cases were present in 25% of patients. This pattern was also noted in a study by Nordback, where among 469 patients, 207 had right-sided hernias, 146 had left-sided, and 116 had bilateral type[15]. A similar observation was reported in a study by Gulzar et al. , where 64 out of 100 patients had right-sided inguinal hernia [16]. Garba ES from Nigeria carried out a survey and concluded that right inguinal hernias were more prevalent than left, with a ratio of 1.7:1.

In the current study, the most frequent clinical manifestation was swelling. Among 72 patients, who were admitted to the surgical department due to groin swelling. This aligns with research conducted by Jenkins JT, which found that groin swelling was the most prevalent clinical presentation [17].

Groin pain accompanied by swelling was observed in 41.66% of the patients. Of all patients experiencing pain with swelling, 60% reported mild pain, while 40% reported moderate pain. Comparable findings were noted by Page B et al. and others who detected mild to moderate pain in patients with inguinal hernia [18-20].

In our research, the most frequently affected individuals were daily laborers, constituting 45%; followed by farmers at 17%; followed by shopkeepers at 14%; the remaining 18% included officers, students, and homemakers. It was noted that the predominance of males was attributed to their engagement in more physically demanding activities, weight lifting, and physical differences between the genders. Furthermore, similar findings were reported by Rao G in 2015, where heavy weight lifting emerged as the most prevalent risk factor among male fishermen [20,21].

Limitations of the study can be attributed to the small sample size, which is inadequate to represent an accurate depiction of the disease. Therefore, additional multicentric studies with larger sample sizes linking aetiological or risk factors are suggested. Furthermore, these types of studies should be carried out in various geographical locations to facilitate future research in predicting the prevalence of inguinal hernias.

Conclusions:

When it comes to middle aged male patients, inguinal hernias are among the most prevalent disorders seen. Given that heavy weight lifting and vigorous activity are two of the most common risk factors for inguinal hernias, employees in the labor or farming industries were more likely to be impacted. As risk factors, altered bowel movement (constipation), smoking, alcohol consumption, and respiratory conditions (chronic obstructive airway disease) were also listed. The most typical way for a clinical presentation is inguinal swelling. A few of the individuals experienced groin pain along with swelling. On the VAS, the pain was classified as mild

to moderate, and relatively few patients need painkillers. Hernias that were indirect were more prevalent than those that were direct. In comparison to the left side, right-sided hernias were more prevalent.

Acknowledgments:

I would like to express my sincere gratitude to my supervisors, Professor Junior Sundresh and Professor Dhanapal for their invaluable guidance, feedback and support throughout my study.

REFERENCES:

1. Lomanto D, Cheah WK, Faylona JM, et al. Inguinal hernia repair: toward Asian guidelines. Asian J Endosc Surg. 2015;8:16–23.
2. Kingsnorth A, LeBlanc K. Hernias: inguinal and incisional. Lancet. 2003;362:1561–71.
3. Abramson JH, Gofin J, Hopp C, Makler A, Epstein LM. The epidemiology of inguinal hernia. A survey in western Jerusalem. J Epidemiol Community Health. 1978;32:59–67.
4. Agarwal PK, Sutrave T, Kaushal D, Vidua R, Malik R, Maurya AP. Comparison of postoperative chronic groin pain after repair of inguinal hernia using nonabsorbable versus absorbable sutures for mesh fixation. Cureus. 2023;15:0.
5. Brunicardi FC, Andersen DK, Billiar TR, Dunn DL, Hunter JG. Schwartz's principles of surgery. 10th ed. New York: McGraw-Hill Education; 2014.
6. de Goede B, Timmermans L, van Kempen BJH. Risk factors for inguinal hernia in middle-aged and elderly men: results from the Rotterdam Study. Surgery. 2015;157:540–6.
7. Ruhl CE, Everhart JE. Risk factors for inguinal hernia among adults in the US population. Am J Epidemiol. 2007;165:1154–61.
8. Sayanna S. Prevalence of inguinal hernia in Indian population: a retrospective study. Med Pulse Int Med J. 2015;2:75.
9. Basu I, Bhoj SS, Mukhopathyay AK. Retrospective study on prevalence of primary and recurrent inguinal hernia and its repairs in patients admitted to a tertiary care hospital. Indian Med Gaz. 2013;203:13.
10. Burcharth J, Pedersen M, Bisgaard T, Pedersen C, Rosenberg J. Nationwide prevalence of groin hernia repair. PLoS One. 2013;8:0.
11. Lau H, Fang C, Yuen WK, Patil NG. Risk factors for inguinal hernia in adult males: a case-control study. Surgery. 2007;141:262–6.
12. Sharma SB, Gupta R. Prevalence and risk factors of inguinal hernia: a study in a semiurban area. J Adv Med Dent Scie Res. 2020;8:83–6.
13. Öberg S, Andresen K, Rosenberg J. Etiology of inguinal hernias: a comprehensive review. Front Surg. 2017;4:52.
14. Kumar BRK, Madhusoodhanan N, Balaji A, Poornima MA. Prevalence and risk factors of inguinal hernia - a hospital based observational study. Int J Med Appl Sc. 2014;3:191–8.
15. Nordback I. Side incidence of inguinal hernias. Ann Chir Gynaecol. 1984;73:87–90.
16. Gulzar G, MR M, Iqbal J, Ulhaq MI, Afzal M. Darning vs bassini repair for inguinal hernia: a prospective comparative study. Prof Med J. 2007;14:128–33.
17. Jenkins JT, O'Dwyer PJ. Inguinal hernias. BMJ. 2008;336:269–72.
18. Page B, Paterson C, Young D, O'Dwyer PJ. Pain from primary inguinal hernia and the effect of repair on pain. Br J Surg. 2002;89:1315–8.
19. Dabbas N, Adams K, Pearson K, Royle G. Frequency of abdominal wall hernias: is classical teaching out of date? JRSM Short Rep. 2011;2:5.
20. Rao G, Rao A, Pujara N, Pujara P, Patel S. Prevalence of hernia among fishermen population in Kutch district, India. Natl J Integr Res Med. 2015;6:44–51.
21. Garba ES. The pattern of adult external abdominal hernias in Zaria. Niger J Surg Res. 2000;2:12–5.

How to cite this article:
Ramya S et al. Ijppr.Human, 2025; Vol. 31 (4): 231-236.

Conflict of Interest Statement: All authors have nothing else to disclose.