



CLINICOEPIDEMIOLOGICAL STUDY OF INGUINAL HERNIA IN A RURAL MEDICAL COLLEGE IN SOUTH INDIA

General Surgery

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ABSTRACT

Background: Inguinal hernia repair is the most commonly performed surgery by general surgeons across India. Despite early recognition, delayed treatment is prevalent in rural areas, leading to increased morbidity and mortality. This study aims to evaluate the clinical, demographic, and risk factors associated with inguinal hernia in a rural South Indian population. **Methodology:** A prospective, non-randomized, single-centre observational study was conducted at Swamy Vivekanandha Medical College Hospital and Research Institute, Tiruchengode, Tamil Nadu, from August 2023 to January 2025. All patients diagnosed with inguinal hernia and willing to undergo surgery were included. After informed consent, demographic data, clinical history, operative findings, and postoperative details were collected and analysed using SPSS version 15. **Results:** Of the 146 patients, 96.59% were male, with a mean age of 53.79 ± 15.30 years. The majority were married (91.79%) and farmers (28.77%). All presented with a lump above the inguinal crease, with 91.11% also reporting pain. Right-sided hernias were slightly more common (36.99%), and 54.12% were of the direct type. Delayed presentation was common due to poor disease awareness. Open mesh hernioplasty (Lichtenstein's procedure) was performed in 86.99% of cases, followed by laparoscopic repair (11.65%) and herniorrhaphy (1.37%). The most common risk factor was heavy lifting (67.13%), followed by occupational risk (25.35%), smoking/substance use (23.29%), altered bowel habits (15.76%), and chronic respiratory disease (14.34%). Bilateral hernias were found in 27.40% of patients. **Conclusion:** Inguinal hernias in rural areas often present late due to lack of awareness. Early detection through awareness programs could reduce disease burden. Males, particularly manual labourers, are at higher risk due to anatomical and occupational factors.

KEYWORDS

Demographic profile, clinical details, risk factors, inguinal hernia.

INTRODUCTION

Inguinal hernias affect 15–20% of the general population and account for 75% of all abdominal wall hernias globally¹. Annually, around 100,000 inguinal hernia repairs occur in the UK and about 750,000 in the USA. In India, the prevalence is estimated at 1.5–2 million with an annual incidence of approximately 1,957,850^{2,3,7}. Lifetime risk is significantly higher in men (27%) compared to women (3%)^{8,9}. Many risk factors contribute to the development of inguinal hernia¹⁰. While early diagnosis and treatment are common in developed countries, late presentations are frequent in developing nations, often leading to increased morbidity and mortality. This study investigates the clinical, demographic, and risk factors associated with inguinal hernias in a rural South Indian population.

METHODOLOGY

Study Design & Setting

This observational study was conducted at Swamy Vivekanandha Medical College Hospital and Research Institute, Tiruchengode, Namakkal district—a 1100-bedded rural tertiary care center. The study spanned 1.5 years (August 2023 to January 2025) and included 146 adults undergoing inguinal hernia repair.

Participants & Data Collection

All consenting adults diagnosed clinically with inguinal hernia were included. Exclusions were made for those unwilling to participate. Detailed demographic and clinical data were collected via a structured questionnaire. Clinical examination involved palpation and assessment for lump, cough impulse or scarring. Diagnosis was confirmed by a surgical consultant. Surgical procedures and outcomes were documented, including postoperative complications and duration of hospital stay.

Data Analysis

Data were entered in Microsoft Excel and analysed using SPSS version 15. Continuous variables were described using mean, median, mode, and standard deviation.

RESULTS

Out of 146 patients, 141 (96.59%) were males, and 5 (3.43%) were females. The mean age was 53.79 ± 15.30 years. Most patients (56.17%) were aged between 50–75 years, and 32.88% were between 25–50 years. Majority were married (91.79%) and engaged in farming (28.77%), weaving (17.81%), or manual labour (14.39%). Socio-economically, 50.01% were from middle-income and 48.64% from low-income groups. Regarding education, 29.46% had primary-level

education, 27.40% high school, and 26.72% were uneducated. Almost all patients presented electively, with only one emergency case. [Table 1]

Table 1: Demographic Details

Variables	n=146	%
Age (in Years) Mean $\pm$ SD	53.79 $\pm$ 15.30	
13 to 25 years	7	4.78
25 to 50 years	48	32.88
50 to 75 years	82	56.17
>75 years	9	6.17
Sex :		
Males	141	96.59
Females	5	3.43
Occupation:		
Farmer	42	28.77
Manual worker	21	14.39
Vendor	8	5.48
Teacher	5	3.43
Student	2	1.37
Coolie	7	4.795
Weaver	26	17.81
Electrician	2	1.37
Mechanic	2	1.37
Plumber	1	0.685
Financier	2	1.37
Driver	9	6.17
Tailor	7	4.795
Carpenter	2	1.37
Office clerk	3	2.055
Mason	5	3.43
Conductor	1	0.685
Others	1	0.685
Marital status:		
Married	134	91.79
unmarried	12	8.22
SES:		
Low Income	71	48.64
Middle Income	73	50.01
Rich	2	1.37
Education:		
Uneducated	39	26.72

Primary	43	29.46
Secondary	40	27.4
HSS	3	2.055
Graduate/PG	21	14.39
House:		
Own house	56	38.36
Rented	90	61.65
Type of Admission:		
Surgery OPD (Elective)	145	100
Emergency OPD	1	0.685

All had a visible lump above the inguinal crease; 91.11% also reported pain. Right-sided hernias were most common (36.99%), followed by bilateral (27.40%) and left-sided (35.62%) hernias. Direct hernias accounted for 54.12% of cases. Only 2 (1.37%) were recurrent. [Table 2]

Table 2: Clinical Features		
Variables	n= 146	%
Duration of Hernia (in days)		
Mean $\pm$ SD	403.38 $\pm$ 532.16	
Median (range)	183	
Pain		
Present	133	91.11
Absent	13	8.91
Duration of Pain (in days)		
Mean $\pm$ SD	346.70 $\pm$ 484.57	
Median (range)	183	
Lump		
present	146	100
Site of Lump		
Above groin crease	145	99.33
Above & below groin crease	1	0.685
Duration of Lump (in days)		
Mean $\pm$ SD	403.38 $\pm$ 532.16	
Median (range)	183	
Changes in Lump with coughing or straining		
Present	145	99.33
Absent	1	0.685
Reducibility		
Reducible	141	96.59
irreducible	5	3.43
Consistency		
Empty & Cystic (Peritoneal fluid)	96	65.76
Doughy & Granular (omentocoele)	14	9.59
Elastic & Gurgling sound (enterocoele)	6	4.11
combined (omentum+ bowel)	3	2.055
Others (bladder, appendix, MD etc.)	27	18.495
Signs of Obstruction/ Incarceration/ Strangulation	5	3.43
increase in pain	3	2.055
Vomiting	1	0.685
Abdominal Distension	1	0.685
Obstipation		
Type of hernia		
Congenital		
Acquired		
Complete (Inguino-scrotal)		
Incomplete		
Direct	79	54.12
Indirect	56	38.36
Combined (Pantaloons' type)	11	7.54
Occurrence		
Primary	144	98.64
Recurrence	2	1.37
Side of Hernia		
Unilateral	108	73.98
Right	54	36.99
Left	52	35.62
Bilateral	40	27.4

The commonest risk factor was heavy lifting (67.13%), followed by occupational exposure (25.35%), smoking/substance abuse (23.29%), altered bowel habits (15.76%), and chronic respiratory disease

(14.34%). [Table 3]

Table 3: Risk Factors			
Sl.no.	Variables	n=146	%
1	COPD / Chronic Bronchitis	21	14.34
2	BHP/urinary tract infections	19	13.02
3	Constipation	23	15.76
4	Lifting heavy weight	98	67.13
5	Farmers / porters /occupational	37	25.35
6	Smoking / tobacco/ substance abuse	34	23.29
7	Obesity	4	2.74
8	PHT/ ascites	1	0.685
9	Previous inguinal incisions	2	1.37
10	Hypertension	16	10.96
11	Diabetes Mellitus	12	8.22
12	Cardiovascular disease	2	1.37
13	Musculoskeletal disorders	2	1.37
14	Marfan's syndrome	2	1.37
15	Patent processus vaginalis	8	5.48
16	Pregnancy	1	0.685
17	Drugs/Hormones	1	0.685

Most surgeries (86.99%) were open mesh hernioplasties (Lichtenstein's repair), followed by laparoscopic repairs (11.65%) and herniorrhaphy (1.37%). Spinal anaesthesia was used in 86.31% of cases, general anaesthesia in 12.33%, and local in 1.37%. [Table 4]

Table 4: Operative Details		
Variables	n=146	%
Type of surgery		
Emergency	1	0.685
Elective	145	99.33
Type of anaesthesia		
GA	18	12.33
RA/SA	126	86.31
LA	2	1.37
Duration of surgery		
< 1 hour	88	60.28
1 to 2 Hours	38	26.03
> 2 Hours	20	13.7
Type of procedure		
Open	129	88.37
Laparoscopic	17	11.65
Intraoperative findings		
Type of hernia		
- same as preop (D vs. I)	143	97.95
- different (D vs. I)	3	2.055
Contents		
- same as preop	144	98.64
-different	2	1.37
Type of hernia repair		
Herniotomy	0	0
Herniorrhaphy (mod. Bassini's)	2	1.37
Hernioplasty (Open)	127	86.995
- Lichtenstein's (OMH)	126	86.31
- Shouldice' Repair	1	0.685
- others	0	0
Hernioplasty (Lap)	17	11.65
- TEP	5	3.43
- TAPP	11	7.54
- IPOM	1	0.685
Combined procedures (other associated conditions)	5	3.43

Intraoperatively, direct hernial sacs were most frequently seen. Bladder involvement was noted in many direct hernias. 85% had no complications. Nine patients (6.17%) had adherent omentum, and one patient (0.685%) required bowel resection for ischemic bowel.

Postoperative complications were minimal—wound infection (2.74%) and seroma (2.06%) were the most common. The average hospital stay was 3.05 $\pm$ 0.79 days. [Table 5]

Table 5: Postoperative complications		
Variables	n=146	%
Wound site haematoma	1	0.685
Seroma	3	2.055

Wound Infection	4	2.74
wound gapping	1	0.685
Prolonged paralytic ileus	1	0.685
Peritonitis	0	0
Bowel obstruction	0	0
Enterocutaneous fistula	0	0
Postoperative Sepsis	0	0
Reoperation	2	1.37
Recurrence	0	0
Prolonged hospital stay	3	2.055
Death	0	0

DISCUSSION

The development of inguinal hernias is primarily due to increased intra-abdominal pressure on a weakened abdominal wall. In this study, the highest incidence was seen in the 50–75 age group, consistent with other Indian studies, including Balram et al and Sayanna et al^{11,1}.

Males were more frequently affected, aligning with previous literature attributing this to anatomical factors and occupational exposures. Most patients delayed seeking care, often presenting within a year of noticing symptoms—an observation consistent with studies by Kumar et al¹².

Right-sided hernias were more common, possibly due to delayed testicular descent and incomplete closure of the right processus vaginalis. Similar laterality patterns were reported by Balram et al and others^{10,11,14}.

Heavy lifting was the most significant risk factor, echoing findings by Kumar R et al. Other risks included smoking, chronic cough, and poor bowel habits—factors contributing to increased abdominal pressure^{4,5,6,12}. Many patients were engaged in physically demanding occupations like farming and weaving¹⁵.

Lichtenstein's open mesh repair was the predominant surgical technique, in line with standard global practices due to its lower recurrence rates. Minimal postoperative complications and short hospital stays reflected the elective nature and effectiveness of early surgical intervention¹³.

Strengths And Limitations

This study adds valuable regional data on inguinal hernia demographics, clinical patterns, and outcomes in rural India. However, limitations include a relatively small sample size and lack of long-term follow-up. Larger, multi-center studies with extended observation are recommended for deeper insights.

CONCLUSION

Inguinal hernias in rural South India predominantly affect middle-aged males, with right-sided and direct hernias being most common. Heavy lifting, occupational strain, and smoking are major risk factors. Increasing awareness and early intervention can reduce complications. Such region-specific studies are essential to inform public health strategies and clinical guidelines for hernia management.

Ethics Clearance

Institutional Ethics Committee approval was obtained (Ref No: SVMCHRI/IEC/OCT/2023/001 dated 16.11.2023).

Conflict Of Interest: None declared.

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