

## Research Article

# PREVALENCE AND RISK FACTORS OF INGUINAL HERNIA – A HOSPITAL BASED OBSERVATIONAL STUDY

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### Abstract :

**Background:** Inguinal hernia is the one of the most common presentation among adult population in a surgical OPD in a tertiary care setting. Many times the patient presents with groin swelling with or without pain and the risk factors associated were increased pressure on the abdomen caused by heavy lifting of weights. **Aims and Objectives:** The aims of this study were to estimate the prevalence of inguinal hernia, coexisting signs and symptoms among adults and its associated risk factors. **Material and Methods:** The study was done as a hospital based observational cross sectional study among the people attending OPD at Tagore Medical College and Hospital, Rathinamangalam. Adults presented with history of groin swelling were directed to the surgical OPD for clinical examination by a surgeon for confirmation of inguinal hernia. **Results:** The study population covered around 7000 persons including males and females, out of which 125 (1.79%) persons were found to be presenting with asymptomatic or minimally symptomatic inguinal hernia, 93.6% were males and the majority 60% belonged to 20 to 50 years. Approximately 11% had swelling for more than 2 years and 20% presented with bilateral inguinal hernia at the time of first presentation. The common risk factors found were constipation, heavy object lifting and chronic cough among 18% of the study population. **Conclusion:** The study had shown a moderately high prevalence of bilateral inguinal hernia with the commonest risk factors being chronic cough and constipation and affecting the productive age group population of males.

**Key words:** Inguinal hernia, Risk factors, Bilateral Inguinal hernia, Constipation, Co – morbidities

### INTRODUCTION

An Inguinal hernia is a protrusion of abdominal cavity and its contents through the inguinal canal. It is very common in men with lifetime risk of 27% and 3% for women<sup>1</sup>. Inguinal hernia repair is a commonly performed general surgery procedure in both adults and children with inguinal hernias constituting more than 95% of all groin hernia repairs.<sup>2</sup> Inguinal hernias can either be congenital or acquired. The proposed and well known risk

factors and causes for inguinal hernias were increased abdominal pressure, preexisting weakness of abdominal muscles, straining during defecation, heavy lifting of weights, obesity, pregnancy etc. Several hypotheses regarding the etiology of inguinal hernia have been proposed; however, large-scale data on the occurrence of inguinal hernia may provide further understanding to the pathophysiology of inguinal hernia development. This study was undertaken to estimate the prevalence, age and gender differences, risk factors associated with the inguinal hernia. In addition to that the signs and symptoms, nature of presentation were also studied. Predominantly in male populations, the risk factors that have been found to be associated with inguinal hernia were muscle weakness (previous appendectomy or other abdominal operations), physical stress, increased intra-abdominal pressure (chronic constipation and prostatism), smoking, aging, pelvic fractures and trauma, connective tissue disease, and systemic illnesses.<sup>3</sup> In females, obesity, pregnancy, and operative procedures have been shown to be risk factors that commonly contribute to the formation of inguinal hernia. However, to the best of our knowledge and extensive literature review, all of these risk factors have not been undertaken in a same study. Henceforth this study was done with the intention of exploring the various aspects of Inguinal hernia and its presentations among adult population.

**Aims and Objectives:**

1. To estimate the prevalence of inguinal hernia among different age groups and to compare the age-specific and gender specific prevalence rates of hernia
2. To assess the risk factors influencing the development of inguinal hernia and determine among which factors inguinal hernia prevalence is more common.
3. To elicit the nature of presentations, signs and symptoms and coexisting morbidities and recurrence rates of inguinal hernia.

**MATERIALS AND METHODS:**

This study was conducted as a hospital based observational study in a tertiary care institute among adults attending surgery outpatient department from May to August 2013. The study participants were interviewed initially using a questionnaire which included the socio demographic details and symptoms of groin swelling. Study participants came to the hospital with complaints of groin swelling with or without pain were interviewed in depth regarding the duration of swelling, family history of inguinal hernia, lifestyle habits, and nature of job, chronic constipation and cough, co morbidities after getting the informed consent. Then the patients with the groin swelling complaints were directed to the surgical outpatient department where the patient was completely examined using standardized protocol by a surgeon and confirmed by another surgeon. During the clinical examination the patients were explained about the purpose of the examination and privacy and confidentiality were ensured. Most of the study participants presented with groin swelling at the initial interview were examined except few with the non response rate around 5% only.

**Examination Procedure:**

An inguinal hernia was diagnosed based on the criteria that clinically detectable swelling in the groin or a clearly palpable defect of the abdominal wall in the groin. For all cases, an operation report was obtained to confirm diagnosis to exclude uncertainty. The most important clinical signs used to detect hernia were reducibility and cough impulse. If there

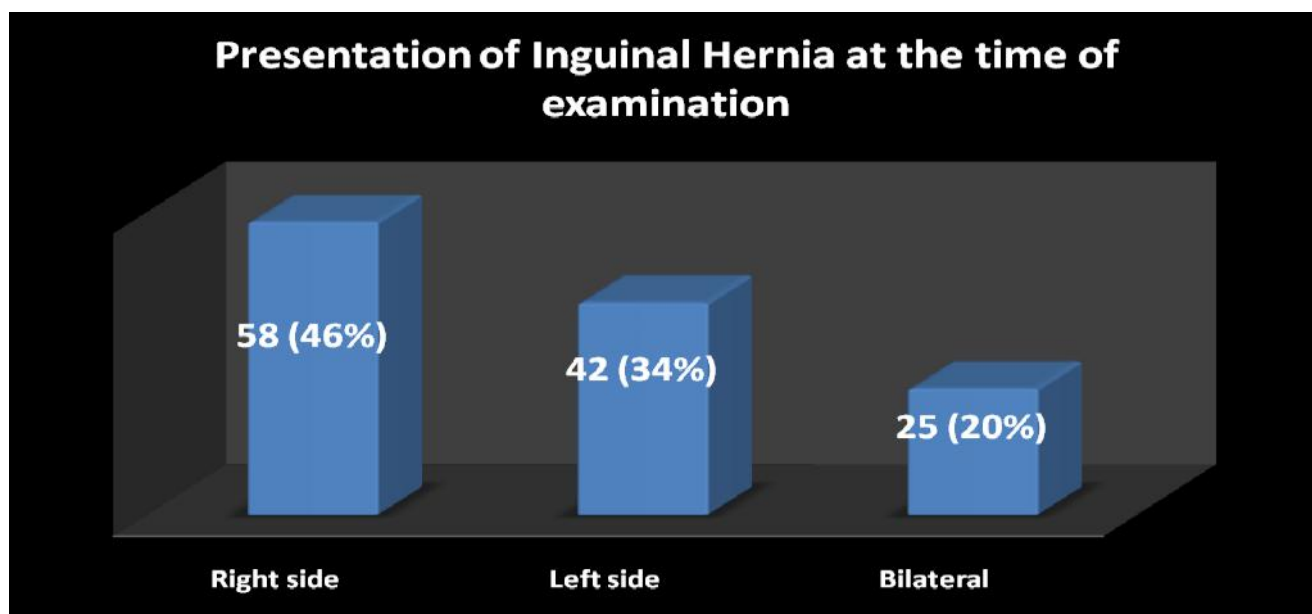
was no visible lump, the scrotum was invaginated by the little finger to reach the external ring, and the subject was asked to cough, in order to determine whether there was a palpable impulse. An impulse at the scar site on coughing was taken as evidence of recurrence. No attempt was made to distinguish between indirect and direct hernias. We studied associations between hernia and a number of other disorders and characteristics, using data from the questionnaire and examination. In all participants, we recorded age, smoking and alcohol history and bowel and bladder habits, history of operations (particularly abdominal operations) and medical history were recorded with a questionnaire. We specifically asked for chronic constipation, obstructive pulmonary and urinary tract disease, trauma of the inguinal region or lower abdomen, fractures of the pelvis, and family history for inguinal hernia, including gender and relation with the family member in order to determine a familial tendency. Furthermore, time of exposure of both present and past work activity was recorded.

## RESULTS:

Our study reported that out of 7000 persons attending the surgical OPD hospital, 125 persons (1.79%) were found to be presenting with symptomatic or minimally symptomatic inguinal hernia. Among 125 persons, 117 were males and 8 were females. The age-distributed prevalence rates of inguinal hernia among the study population was 5.6%, 24.8%, 35.2%, 22.4%, 12% in less than 20 years, 20 to 34 years, 35 to 49 years, 50 to 64 years and 65 years and above respectively. Majority 85 (68%) of the study participants had history of groin swelling for the past less than one year followed by 40 (32%) had swelling for more than a year. (Table 1) As far as the presentation of inguinal hernia was concerned 58 (46%) had right sided hernia and 42 (34%) had left sided hernia. Bilateral inguinal hernia was present among 25 (20%) of the study population (Figure – 1). Moreover 4 (3.2%) of the patients had undergone a previous hernia repair in the past (i.e., had a recurrent hernia). Almost all cases were presented with complaints of swelling in the groin region and symptoms of pain and discomfort was present among 44% and 47% respectively. Out of 125 cases with obvious swellings, 102 (81.6%) cases were having reducible hernias and 19 (15.2%) cases were having irreducible hernias and remaining 4 (3.2%) cases were initially reducible and later became irreducible. (Table – 2). Around 110 (88%) cases were presented with soft palpable hernias and 7 (5.6%) cases had family history of hernias, 10 (8%) cases with bowel disturbances like chronic constipation, 12 (9.6%) cases had bladder disturbances like frequent micturition, 12 (9.6%) cases had history of chronic cough. While assessing their lifestyle habits 29 (23.2%) cases were chronic smokers and 16 (12.8%) cases were alcoholics. By assessing the occupational status of all patients, 61 (48.8%) cases were found to be having positive history of heavy object lifting. Among these 61 cases, 21 (16.8%) cases were heavy object lifters for <10 yrs, 29 (23.2%) & 11 (8.8%) cases were heavy object lifters for 10-30 yrs & >30 yrs respectively. (Table – 3) As mentioned above, few cases were presented with other co morbidities. 37 (30%) cases were having diabetes mellitus, 23 (18%) cases were having hypertension, and 6 (5%) cases were having chronic obstructive pulmonary disease. Moreover 10 (8%) cases with positive history of tuberculosis, 4 (3%) cases with anal fissures, and 4 (3%) cases with prostatic hypertrophy were also seen among the study participants.

**TABLE – 1 FREQUENCY DISTRIBUTION OF INGUINAL HERNIA AMONG STUDY PARTICIPANTS**

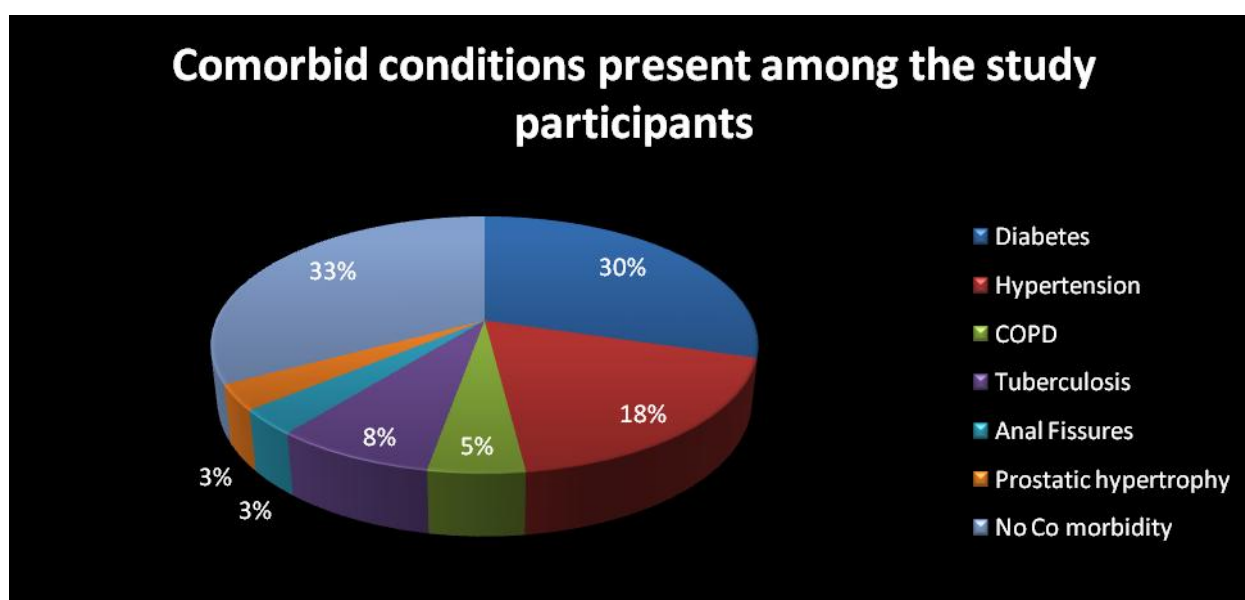
Variables	Inguinal hernia (N = 125)
Gender	
Males	117 (93.6%)
Females	08 (6.4%)
Age group	
Less than 20 years	07 (5.6%)
20 to 34 years	31 (24.8%)
35 to 49 years	44 (35.2%)
50 to 64 years	28 (22.4%)
65 years and above	15 (12%)
Period of swelling	
Less than 1 year	85 (68%)
1 to 2 years	26 (20.8%)
More than 2 years	14 (11.2%)

**FIGURE – 1****TABLE – 2 SIGNS AND SYMPTOMS OF INGUINAL HERNIA AT THE TIME OF PRESENTATION**

Variable	Frequency (%)
Pain	55 (44%)
Discomfort	59 (47.2%)
Swelling	125 (100%)
Reducible	102 (81.6%)
Non reducible	19 (15.2%)
Reducible to non reducible	4 (3.2%)

**TABLE – 3 RISK FACTORS FOR INGUINAL HERNIA AMONG THE STUDY PARTICIPANTS**

Variable (Risk factor)	Number (%)
Family history	07 (5.6%)
Bowel disturbances	10 (8%)
Bladder disturbances	12 (9.6%)
Chronic cough	12 (9.6%)
Smoking habits	29 (23.2%)
Alcohol drinkers	16 (12.8%)
Heavy object lifting	61 (48.8%)
Coexisting co-morbidities	84 (67.2%)

**FIGURE – 2****DISCUSSION:****Age and Gender distribution of Inguinal hernia:**

Our study had explored the evidence for age- and gender distribution of inguinal hernias. The age- distributed prevalence rates shows that inguinal hernia prevalence was peaking at adult age group of 20 – 49 which constituted almost 60% of inguinal hernias in this study whereas Indrani Basu et al study showed that the peak incidence of inguinal hernia was 42 to 57 years<sup>4</sup>. It is relatively less common in adolescent age groups. This evidence was not supported by many studies like But in some studies it is shown that age distribution is bimodal peaking at early childhood and old age<sup>5</sup>. As shown in the results that out of 125 cases, 117 were males and 8 were females which showed the male to female ratio of 14:1. This might be due to anatomical difference between males and females. Moreover females

are not highly exposed to increased physical activity so that their work burden is relatively lesser when compared with males. Therefore, owing to various anatomical and occupational disparities between males and females, inguinal hernias were less common among females. The lifetime risk of developing inguinal hernia was 15 to 27% in men and 3% in women whereas in American population the male to female ratio is 5:1<sup>6, 7, 8</sup>. Right inguinal hernias were more common than left inguinal hernias. Nearly 20% cases were found to be bilateral inguinal hernias. The ratio of right versus left inguinal hernia was 1.3 : 1 in this study which is similar to a study conducted in Khanpur by Mukesh sangwan et al showed 1.45 : 1<sup>9</sup>. Almost all cases were presented with complaints of swelling in the groin region. In that, 85 cases were presented with swellings for <1 yr. This is because some patients are not eligible for hernia repair or do not seek medical attention for their hernia immediately. Most patients see a physician only after pain and discomfort that limits their activity. It is also shown that majority of patients were found to be presenting with reducible hernias i.e., swellings can be pushed back into the abdomen by lying down or putting manual pressure to it. Few cases (18.4%) were irreducible hernias which indicated complications like obstruction, incarceration and strangulation.

### **Risk factors for Inguinal hernia**

Our study has studied all potential risk factors as reported in the literature. The main risk factor associated with inguinal hernias was found to be heavy object lifting. The results showed that those who had previous history of heavy object lifting for 10 yrs were more prone for developing inguinal hernias. In these 125 cases, about half of the men were found to be doing strenuous jobs. This is because majority of patients attending the hospital were low socio-economic status people from surrounding villages. Their main occupation is farming, construction works etc., which involves increased physical activity which in turn accounts for increased abdominal pressure resulting in developing inguinal hernias. For these men, a durable repair is relatively important to prevent recurrence. The other contributing factors were found to be straining during micturition and defecation & chronic cough in case of TB (8%). These factors increase abdominal pressure resulting in developing inguinal hernias. In chronic smokers (23.2%), muscles get weakened which may further increase risk for developing inguinal hernias. The risk factors found out in this study were similar to the study done in USA which showed that the inguinal hernia was associated with older age, obesity, greater height, chronic cough, rural residence<sup>10</sup>. This was supported by many other studies like Lau H et al and Junge K et al, which showed that family history is an important predictor for development of inguinal hernias and as well as recurrent hernia. The other risk factors suggested were chronic cough, chronic constipation, Chronic Diabetes and Prostatic hypertrophy<sup>11, 12</sup>. Symptoms of prostatism were present in approximately 16% cases while hypertension and diabetes were present in approximately 11% and 5% cases respectively<sup>9</sup>. (Khanpur study). Similarly the common co morbid conditions presented in our study were diabetes (30%) and hypertension (18%) but only 3% showed prostatic symptoms. Any activity or medical problem that increases pressure on the tissue in the belly wall and muscles may lead to a hernia. These include prostatic hypertrophy and anal fissures which causes straining during urination and defecation respectively. Some other studies reported that prostatic hypertrophy and varicosities were associated with hernia. But only few cases were found to be having enlarged prostate (3.2%) and anal fissures (3.2%). No results were shown for varicosities.



**LIMITATIONS:**

- These results don't give overall prevalence rates because some people do not seek medical help for their hernias because they do not consider it as a "disease"; and some people do not seek medical help because they simply do not have symptoms.
- The other limitation is we failed to measure weight of all patients. Only few patients' weight was measured. So we failed to explain or establish the relation between Obesity and Inguinal hernias.

**CONCLUSION:**

This prevalence study showed that the age distribution of inguinal hernia repair was peaking at adult age with male preponderance of 14: 1 male to female ratio. Our study elicited that heavy object lifting and chronic constipation were major risk factors for inguinal hernia in males. Henceforth, in patients with unexplained lower abdominal pain, the presence of these factors should prompt the physician to consider the diagnosis of inguinal hernia. This information can potentially create a basis for formulating new hypotheses regarding disease etiology. It is concluded that these results may be a useful guide for future studies about the prevalence of inguinal hernias in the populations as a whole.

**Conflict of interest: NIL**

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