Original Research Article

Demographic study in operated patients with inguinal hernia

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Abstract

Background: Inguinal hernia is most common anterior abdominal wall hernia and affects all ages with male predominance. The main cause of inguinal hernia is increased abdominal pressure and muscle weakness of abdominal wall. Diagnosis of inguinal hernia is mostly made by clinical examination. Herniotomy, herniorrhaphy, hernioplasty by open operation and laparoscopic procedures is the operative treatment. **Material and Method:** This retrospective study was conducted in the department of surgery in J.K. Hospital in 411 operated patients with diagnosis of inguinal hernia. **Results:** Highest number of patients belongs to 41-60 years age group (42.8%). 94.6% were male and 5.3% were female patients. Risk factors included benign prostate hypertrophy (37.9%), chronic cough (18.5%), heavy weight lifting (33.6%), chronic constipation (13.6%), abdominal wall muscle weakness due to older age (24.8%) & previous appendicectomy (0.7%). Less common risk factors are positive family history (15.6%), smoking (30.6%), obesity (21.2%) and pregnancy (0.4%). 69.8% patients presented as indirect, 28.2% as direct inguinal hernia and 1.2% as both variety. 67.6% patient presented as right inguinal hernia followed by left (29.2%) and bilateral (3.2%) respectively. Elective operation (94.4%) is more common than emergency operation (5.6%). Open hernioplasty (96.6%) was the most common procedure. Open herniorrhaphy was performed in few patient (2.7%). Open herniotomy was procedure of choice for paediatric patients (0.7%). **Conclusion**: This demographic study of inguinal hernia in this region can guide as to better understanding of the trends of this disease.This useful information may aid in the assessment and definitive care of these patients with inguinal hernia.

Keywords: Demographic Study, Inguinal Hernia, Risk factors

Introduction

A hernia is defined as the protrusion of part or whole of an organ or tissue through the wall of the cavity that normally contains it [1]. Inguinal hernia is the most common type of hernia and affects chiefly men [2]. This is a condition in which intra-abdominal content protrudes through inguinal canal. Inguinal hernia accounts for around 75% of all anterior abdominal wall hernias, with a prevalence of 4% in those over 45 years [3]. In general, inguinal hernia affects all ages, but the incidence increases with age [4].

An inguinal hernia can occur in paediatric age group as congenital inguinal hernia or in adult age group as acquired inguinal hernia.Lifetime risk of inguinal hernia repair is 27% for men and 3% for women, indicating an immense inguinal hernia disease burden [5]. There are two main subtypes of inguinal hernia. In direct inguinal hernia; intra-abdominal contents protrude within the inguinal canal directly through a weakness in the posterior wall of the inguinal canal. They occur more commonly in older patients due to abdominal wall muscle weakness and laxity.

Indirect inguinal hernias are more common than direct inguinal hernia. In this type, the intra-abdominal contents protrude through inguinal canal via the deep inguinal ring. At the time of surgery, these two types of hernia can be well differentiated on the basis of location of inferior epigastric artery. Direct inguinal hernia presents as protrusion of hernia sac medial to this artery and direct inguinal hernia lateral to this artery. Initially the inguinal hernia presents as swelling with mild discomfort and dragging pain in the inguinal region,

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which is reducible and disappear with manual reduction or after the patient lies down. These hernias may progress with time and present as inguino-scrotal swelling with increased pain and discomfort. Sometimes these hernias present as irreducible swelling in untreated cases and may be complicated by strangulation, incarceration and obstruction.

The main causes of inguinal hernia are increased abdominal pressure due tochronic cough, heavy weight lifting, chronic constipation and benign prostate hypertrophy. Other causes of inguinal hernia are muscle weakness of abdominal wall in older age or due to some pathology or previous operation, obesity, pregnancy etc.

Diagnosis of inguinal hernia is made by clinical examination in standing and lying down position with inspection of appearance of groin swelling and cough impulse. Ultrasonography is usually indicated in patients with a recurrent hernia or suspected hydrocele, when the diagnosis is uncertain, or if there are surgical complications. Otherinvestigations like MRI are rarely advised in inguinal hernia patients to differentiate the femoral hernia and inguinal hernia.

There is no place of any medical and conservative management in inguinal hernia patients. The treatment of inguinal hernia is only operative; as delay in treatment always invites the complications although watchful expectancy is advised in some patients with severe comorbidities and very elderly age group who are unfit for surgery. Early diagnosis and elective repair are a safe and effective strategy for patients of all ages that avoid incarceration, strangulation and their complications [6]. In pediatric age group, inguinalherniotomy by open surgery and laparoscopic procedure is the operative treatment. In adult group, herniorrhaphy, tension free mesh hernioplasty and laparoscopic hernia repairsare the surgical options.

Methods

Place of study: Department of Surgery, J.K. Hospital associated with L.N. Medical College Bhopal (M.P.).
Type of study: Retrospective study

Sampling Method: Consecutive

Sample collection: Data were collected from medical record department. 411 paediatric and adult patients with diagnosis of inguinal hernia, operated in department of surgery were included in this study. All the relevant details were obtained from medical record department with all demographic details.

Data were tabulated using detailed proforma. Details of patients like age, sex, risk factors, type of inguinal hernia, side of hernia, timing of operation, operative procedure and complications were recorded. In all case records of operated patients with inguinal hernia, initial diagnosis was made on the basis of detailed history and clinical examination. In all the cases, open herniotomy, herniorrhaphy and hernioplasty technique were performed. All the relevant collected data was compiled on master chart.

Inclusion criteria: Only operated patients with inguinal hernia of age group <80 years of either sex were included in the study. All the cases of elective and emergency hernia repair were included.

Exclusion Criteria: Patients who were >80 years or who refused surgery and kept on conservative management were excluded from the study.

Statistical Methods: Results were shown in tables, comparing their numbers and percentages by scientific calculator and standard appropriate statistical formula.

Ethical Permission: Yes

Results

The aim of this study was to analyze statistics and demographic details in operated patients with inguinal hernia. Records of patients with inguinal hernia, who were admitted and operated in surgical wards, were obtained from medical record department and after analysis the data following observations and results were obtained.

Table-1: Age wise distribution.

Age group (years)	Total admission	%
0- 20	3	0.7%
20-40	130	31.6%
41-60	176	42.8%
61-80	102	24.8%
	411	

Age – Highest number of patients belongs to 41-60 years age group (42.8%). Only 0.7% patients were of pediatric and young age group.

Table-2: Sex Wise Distribution.

	Total admission	%
Male	389	94.6%
Female	22	5.3%
	411	

Sex – Out of total admission of 411, 94.6% were male patients and 5.3% were female patients.

Table-3: Risk Factors for inguinal hernia.

Risk factors		Number of patients	%
Increased intra-abdominal pressure	Prostate hypertrophy (BPH)	156	37.9%
	Chronic cough (COPD)	76	18.5%
	Heavy weight lifting	138	33.6%
	Chronic constipation	56	13.6%
Increased abdominal wall muscle weakness	Older age	102	24.8%
	Previous Appendicectomy	3	0.7%
Other	Family history	64	15.6%
	Smoking	126	30.6%
	Obesity	87	21.2%
	Pregnancy	2	0.4%

Most risk factors associated with inguinal hernia in the present study include increased intra-abdominal pressure due to benign prostate hypertrophy (37.9%), chronic cough /COPD (18.5%), heavy weight lifting (33.6%) and chronic constipation (13.6%). Other common risk factors are increased abdominal wall muscle weakness due to older age (24.8%) and previous appendicectomy (0.7%). Less common risk factors are positive family history (15.6%), smoking (30.6%), obesity (21.2%) and pregnancy (0.4%).

Table-4: Types of inguinal hernia.

	Number of patients	%
Indirect inguinal hernia	287	69.8%
Direct inguinal hernia	116	28.2%
Direct and Indirect inguinal hernia	5	1.2%
Congenital hernia	3	0.7%

In the present study 69.8% patients were diagnosed clinically and intra-operatively as indirect inguinal hernia. Only 28.2% patients were diagnosed as direct inguinal hernia. In some cases both direct and indirect component of inguinal hernia found (1.2%). Only 0.7% patients of paediatric age group operated.

Table-5: Side of inguinal hernia.

	Number of patients	%
Right	278	67.6%
Left	120	29.2%
Bilateral	13	3.2%

In the present study, 67.6% patient were diagnosed as right inguinal hernia followed by left inguinal hernia (29.2%) and bilateral (3.2%).

Table-6: Timing of operation: Elective or Emergency hernia repair.

	Number of patients	%
Elective hernia repair	388	94.4%
Emergency hernia repair	23	5.6%

Elective inguinal hernia repair (94.4%) is more common than emergency operation (5.6%) in the present study.

Table-7: Operative treatment of inguinal hernia.

Procedures	Number of patients	%
Open Herniotomy	3	0.7%
Open Herniorrhaphy	11	2.7%
Open Hernioplasty	397	96.6%

In the present study, most of the inguinal hernias were repaired by tension free open mesh hernioplasty (96.6%). Open herniorrhaphy was performed in few patient (2.7%). Open herniotomy was procedure of choice for paediatric patients (0.7%) with congenital inguinal hernia.

Discussion

Age wise distribution analysis of the data reveals that most common age group affected with inguinal hernia in the present study was 41-60 years age group (42.8%) followed by 21-40 years age group (31.6%) and 61-80 years age group (24.8%). Only 0.7% patients were of paediatric and young age group (0-20 years). Patients with middle and older age group usually get an inguinal hernia due to multiple etiologies associated with increased intra-abdominal pressure with age related weakness of abdominal wall muscles.

According to a similar study of G. Balamaddaiah et al, out of the 212 patients, 35.8% of the patients were aged between 46-60 years, which was the commonest age group, followed by 31-45 years with 63 (29.7%) of the patients [7]. This was similar to other studies such as Sayanna et al and Basu et al [8, 9]. This finding about the age distribution was not supported by some studies. Burcharth J et al reported bimodal peaking in case of inguinal hernia [4]. According to him, patients between 0–5 years and 75–80 years constituted the two dominant groups for inguinal hernia repair.

Sex wise distribution analysis of the data suggest male to female ratio is 17.6: 1, with 94.6% male patients and 5.3% female patients. Male predominance in the present study may be due to strenuous exercise in male patients which leads to increased intra-abdominal pressure, a well-known risk factors for hernia. Gupta et al reported an incidence of 96% males compared to females while Charles et al reported 93.2% of all the cases to be males [10, 11]. McIntosh A et al reported a 9:1 male predominance [12].

Most risk factors associated with inguinal hernia in the present study include increased intra-abdominal pressure due to benign prostate hypertrophy (37.9%), chronic cough /COPD (18.5%), heavy weight lifting (33.6%) and chronic constipation (13.6%). Other common risk factors are increased abdominal wall muscle weakness due to older age (24.8%) and previous appendicectomy (0.7%). Similar findings regarding risk factors were studied by G. Balamaddaiah et al [7].

In his study, the main risk factor was lifting of heavy weights (52.4%) followed by bowel disturbance which accounted for 46.7% of the cases. Smoking and diabetes were other common reasons for hernia. Hernia due to heavy object lifting was common in a similar study by Kumar R et al, 48.8% had hernia due to lifting heavy objects, with smoking habits and chronic cough being the other common risk factors [13]. In a study of S.Vijayakumar et al, the main risk factor associated with inguinal hernias was found to be heavy object lifting especially in the industrial workers [14].

The other contributing factors were found to be straining during urination and defecation & chronic cough in case of TB. Chronic cough, chronic constipation and benign prostatic hypertrophy are other risk factors as suggested by other studies [15,16,17]. Medical comorbidities like chronic cough, chronic constipation and benign prostate hypertrophy increase intra-abdominal pressure leads to more chance of hernia development especially in the older patients with decrease muscle tone and increased abdominal wall muscle weakness. Less common risk factors in the

present study are positive family history (15.6%), smoking (30.6%), obesity (21.2%) and pregnancy (0.4%). Positive family history as a risk factor 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 [16,17].

Smoking may be associated with hernia in the present study but no evidence of association found by several studies, also this havebeen demonstrated that men who are overweight or obese have a lower risk of inguinal hernia than men of normal weight in several studies [18, 19].

In the present study 69.8% patients were diagnosed clinically and intra-operatively as indirect inguinal hernia. Only 28.2% patients were diagnosed as direct inguinal hernia. In some cases both direct and indirect component of inguinal hernia found (1.2%). Only 0.7% patients of paediatric age group operated. In a study of Ayesha Fatima et al out of the total 457 inguinal hernias, 379(82.93%) were of indirect variety and 78(17.07%) were direct variety [20].

But S.Vijayakumar et alreported contradictory findings; direct inguinal hernia 61.55% as most common inguinal hernia followed by indirect inguinal hernia 28.46%, pantaloon inguinal hernia 3.84%, and congenital inguinal hernia 6.15% [14]. Direct inguinal hernia is most commonly found in the older age group. In the present study due to a smaller number of older age group patient, we found indirect inguinal hernia as a more common variant.

In the present study, 67.6% patient were diagnosed as right inguinal hernia followed by left inguinal hernia (29.2%) and bilateral (3.2%). Saeed et alfound 70% to be right sided while 30% were left sided [21]. Balram et al reported a total of 62.3% of the inguinal hernias to be on the right hand side compared to left or bilateral [22]. Right side predominance of the inguinal hernia is due to the late descent of the right testis and more frequent failure of closure of right processus vaginalis.

Elective inguinal hernia repair (94.4%) is more common than emergency operation (5.6%) in the present study. According to Primatesta P et al, 9% of patients underwent operation in an emergency admission in his study [5]. A study by Abi-Haidar et al, within a Veterans Affairs healthcare system population during an 8-year period demonstrated that the frequency of emergent inguinal hernia repair among all inguinal hernia repairs was 6.1% [23]. Increased incidence of elective inguinal hernia repair suggests the more awareness about the risk of complication associated with untreated inguinal hernia in normal population. There are various operative methods of inguinal hernia repair, have been introduced since last century.

All the hernia repair surgery can be categorized as tension repair and tension free mesh repair or open and laparoscopic approach. The goal of hernia repair is to provide the tension free strongest repair with least chance of complications and recurrence with quickest recovery. In the present study, most of the inguinal hernias were repaired by tension free open mesh hernioplasty (96.6%).

The use of synthetic mesh reduces the risk of hernia recurrence and appears to reduce the chance of persisting pain [24]. Open herniorrhaphy was performed in few patient (2.7%) due to unavailability of mesh. Open herniotomy was procedure of choice for paediatric patients (0.7%) with congenital inguinal hernia. No laparoscopic hernia repair (TEP or TAPP method) performed in our study. Comparison of open vs. laparoscopic approach is a matter of debate among the surgeons since the introduction of laparoscopic treatment of inguinal hernia.

Neumayer et al reported on the results of a large randomized study comparing open-mesh versus laparoscopic treatment of inguinal hernia and showed that the risk for recurrence is less than half after open-mesh procedures when compared to laparoscopic procedures [25]. According to recent meta-analyses laparoscopic hernia repair is associated with an increased risk for serious complications [26,27]. But some studies advocates laparoscopic repair better than open inguinal hernia repair. The use of mesh during laparoscopic hernia repair is associated with a relative reduction in the risk of hernia recurrence of around 30-50%. However, there is no apparent difference in recurrence between laparoscopic and open mesh methods of hernia repair.

The data suggests less persisting pain and numbness following laparoscopic repair. Return to usual activities is faster. However, operation times are longer and there appears to be a higher risk of serious complication rate in respect of visceral (especially bladder) and vascular injuries [28]. Lien hart et al suggested that there was a higher frequency of laparoscopy is being performed in middle aged patients, without important co morbidity, in private hospitals in France [29].

Conclusion

Inguinal hernia is one of the common benign diseases frequently encountered in surgery outdoor and usually found in patients with risk factors like increased intra-abdominal pressure due to benign prostate hypertrophy, chronic cough, heavy weight lifting, chronic constipation, increased abdominal wall muscle weakness due to older age and previous appendicectomy etc.

Symptomatic hernia always warrants surgery as delay in treatment leads to complication. Patients should be educated for early operative treatment to prevent the complications.

Contribution from authors

- Dr. Vikas Kumar Malviya formulated the aims & objectives with study design.
- Dr. Tarun kumar Sainia contributed to the preparation of the manuscript and Data analysis.
- Dr. Kamal Kishor Parmar helped in data collection from medical record department.
- Dr. Shrikant Sharma supervised and guided for study

What this study adds to existing knowledge: In literature, few epidemiologic studies of inguinal hernia have been carried out.

Inguinal hernia epidemiology in this region can guide us to better understanding of the trends of this disease, which is most commonly encountered in our society.This useful information may aid in the assessment and definitive care of these patients with inguinal hernia.

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