A Demographic analysis of Inguinal Hernia patients

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***Abstract*—Background: The most common anterior abdominal wall hernia, known as an inguinal hernia, affects people of all ages and is more common in men. Anterior abdominal wall hernias are a highly prevalent surgical condition that impact millions of individuals annually. Due to economic factors and their generally benign nature, they are not given priority treatment in underdeveloped nations. Despite the procedure's frequent use, surgeons still face challenges regarding optimal prevalence, associated etiological variables, outcomes, co-morbidities, and recurrence.**

Aim: The purpose of this study was to analyze the demographic characteristics of patients with inguinal hernias.

Material and Method:

This is a retrospective study conducted in the surgery department of the NIUM (National Institute of Unani Medicine) Hospital Bangalore from October 2018 to October 2023. A total of 160 cases were studied retrospectively. The medical records and proformas were used to collect the data, which was later analyzed using statistical package for social science (SPSS) software version 17 for Windows.

Results and Discussion: Highest number of patients belongs to 41-60 years age group (43.125%). 98.125% were male and 1.87% were female patients. Risk factors included heavy weight lifting (33.75%), benign prostate hypertrophy (28.75%), chronic constipation (16.25%), chronic cough (15%), abdominal wall muscle weakness due to older age (25.62%) & previous inguinal hernia repair (8.12%), appendicectomy (2.5%). Less common risk factors are smoking (32.5%), diabetes (11.87%), alcoholism (10%) and positive family history (4.37%). 69.8% patients presented as indirect, 28.2% as direct inguinal hernia and 1.2% as both varieties. The incidence of inguinal hernia was 67.6% on the right side, 29.2% on the left side, and 3.2% were bilateral. Elective operation (94.4%) is more common than emergency operation (5.6%). The most common procedure performed was open hernioplasty (96.6%). A small proportion of patients (2.7%) underwent open herniorrhaphy. For pediatric patients (0.7%), an open herniotomy was performed.

Conclusion: These findings could serve as a helpful reference for further studies on the demographic characteristics of inguinal hernias in general populations.

***Index Terms*—Demographic Study, Heavy weight lifting, Inguinal Hernia, Risk factors.**

I. INTRODUCTION

A protrusion of the abdominal cavity and its contents through the inguinal canal is called an inguinal hernia. The lifetime risk is 27% for men and 3% for women, making it a highly prevalent condition.[1] It is estimated that the prevalence of abdominal wall hernias is 1.7% in all age groups and 4% in individuals over 45. Of all the hernias, 75% are inguinal hernias.[2] Although inguinal hernias often afflict people of all ages, their frequency rises with advancing years.[3]

There are two main types of inguinal hernia: direct and indirect. In a direct inguinal hernia, intra-abdominal contents protrude directly into the inguinal canal through a weakened posterior abdominal wall (Hesselbach's triangle). This type is more common in elderly people due to the weakening and laxity of abdominal muscles. On the other hand, an indirect inguinal hernia is more frequent than the direct type. This form occurs when the deep inguinal ring allows the intra-abdominal contents to protrude into the inguinal canal or patent processus vaginalis. During surgery, the two types of hernia can be easily distinguished by the placement of the inferior epigastric artery. The direct hernia sac protrudes medially to this artery, while the indirect hernia protrudes laterally it may be Congenital or acquired. Increased abdominal pressure, previous abdominal muscular weakness, straining during defecation, heavy weight lifting, obesity, pregnancy, and other factors were among the well-known risk factors and causes for inguinal hernias. Although there have been a number of theories put forth on the genesis of inguinal hernias, extensive data on their incidence

could offer new insights into the pathophysiology of inguinal hernia development.[4]

The diagnosis of inguinal hernia is typically established by clinical examination in both standing and lying down positions, observing the occurrence of groin swelling and cough impulse, and further confirmed through ultrasonography.

Inguinal hernias can only be treated through surgery, as delaying treatment can increase the risk of complications.[5] In pediatric patients, surgical treatment for inguinal herniotomy involves a combination of open surgery and laparoscopic methods. For adults, surgical alternatives include laparoscopic hernia repairs, tension-free mesh hernioplasty, and herniorrhaphy.

II. METHODS

Place of study: Department of Surgery**,** National Institute of Unani Medicine (NIUM), Bangalore affiliated to Rajiv Gandhi University of Health Sciences Karnataka, Bangalore.

Type of study: Retrospective study

Sampling Method: Consecutive

Sample collection: Information was obtained from the General Surgery Operation Theatre Register and the Medical Record Department (MRD). Contextual data was collected, encompassing demographic details. The age, sex, risk factors, clinical presentation, kind of inguinal hernia, side, and surgical technique of each patient were recorded together with other pertinent demographic data. Based on a detailed history and clinical review of all patient records, an inguinal hernia was initially diagnosed, and all relevant data was compiled on a master chart.

Statistical Methods: The data was analyzed using a scientific calculator and standard statistical methods, and the results were presented in tables and figures.

III. RESULTS

Examining demographic and statistical data pertaining to patients with inguinal hernias was the aim of this study. The records of patients with inguinal hernias who were admitted to surgical wards and underwent surgery were made available by the medical record department. Data on observations and results were obtained after analysis.

Table-1: Age wise distribution.

Age group (years)	Total admission	Percentage (%)
0-20	13	8.125
20-40	37	23.125
41-60	69	43.125
>60	41	25.625
Total	160	100

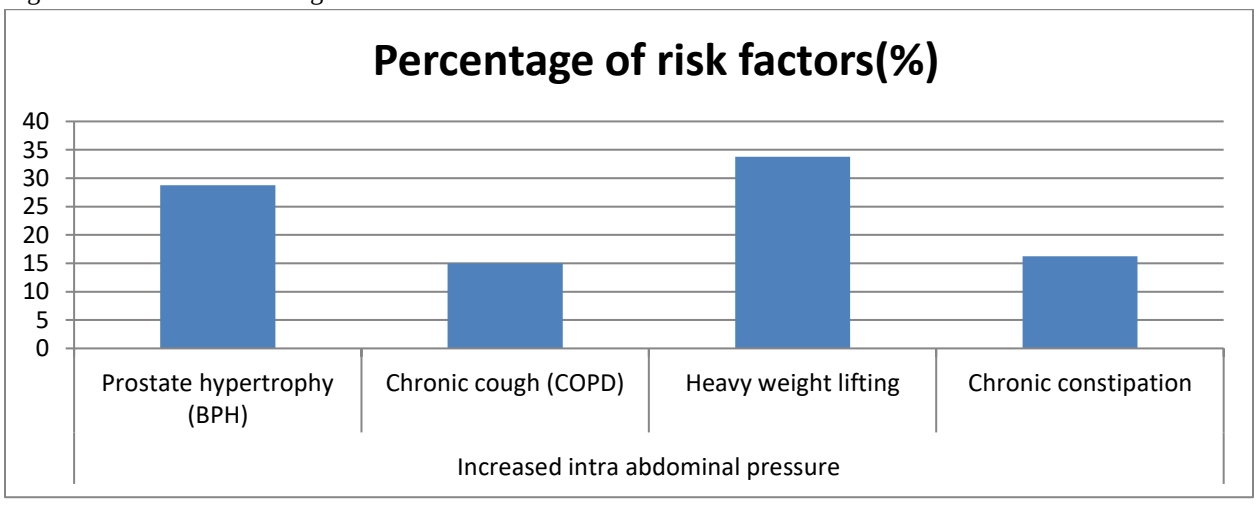
Age – Highest number of patients belongs to 41-60 years age group (43.125%). Only 8.125% patients were of pediatric and younger age group.

Table-2: Gender Wise Distribution.

	Total admission	Percentage (%)
Male	157	98.125
Female	03	1.87
Total	160	100

Gender–98.125% of the 160 patients were male, and 1.87% of the patients were female.

Figure-1: Risk Factors for inguinal hernia.



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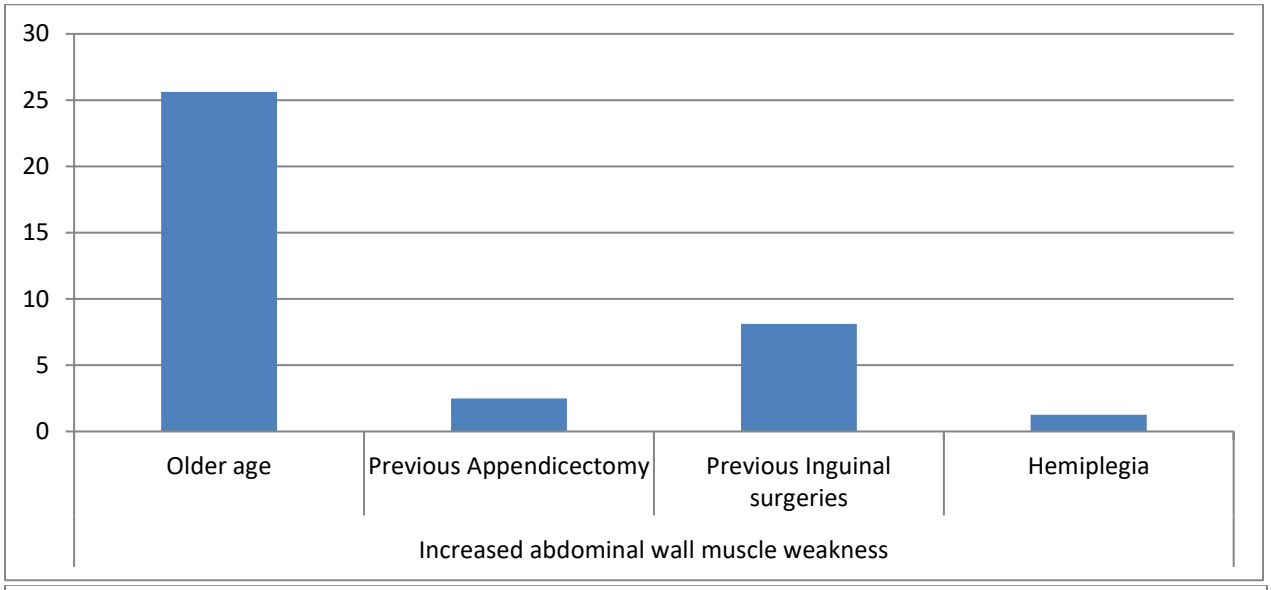

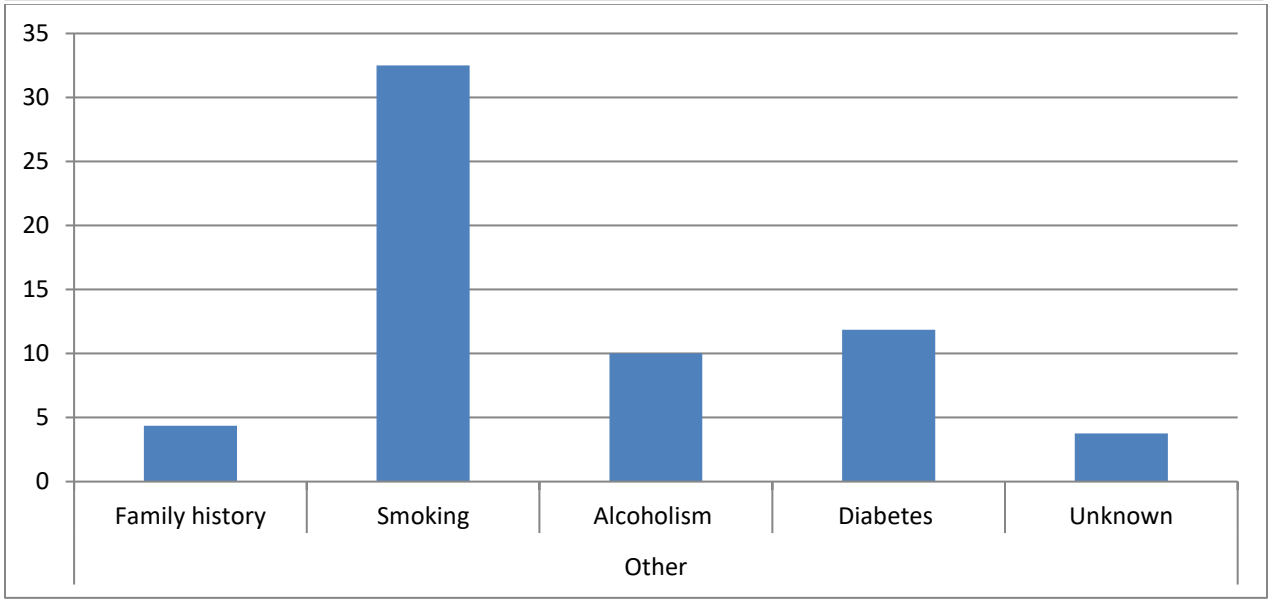

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Most risk factors associated with inguinal hernia in the present study include increased intra-abdominal pressure due to heavy weight lifting (33.75%). benign prostate hypertrophy (28.75%), chronic constipation (16.25%), and chronic cough /COPD (15%). Other common risk factors are increased abdominal wall muscle weakness due to older age (25.62%) and previous Inguinal hernioplasty (8.12%). Less common risk factors are smoking (32.5%), Diabetes (11.87%), positive family history (4.37%) and unknown (3.75%).

Table-3: Body mass index (BMI)-based distribution of inguinal hernias.

BMI	Number of patients	Percentage (%)
<18.5 (underweight)	11	6.875
18.5-24.9 (normal weight)	108	67.50
25.0-29.9 (overweight)	39	24.375
30.0-34.9 (obesity class I)	02	1.25

108 patients (67.50%) had a normal BMI, 39 patients (24.35%) were overweight, and 11 patients (6.875%)

had a low BMI. Merely 2 individuals, or 1.25 percent, had a BMI greater than 30.

Table-4: Clinical presentation of the inguinal hernia.

Symptoms	Number of patients	Percentage (%)
Swelling	160	100
Pain with swelling	35	21.87

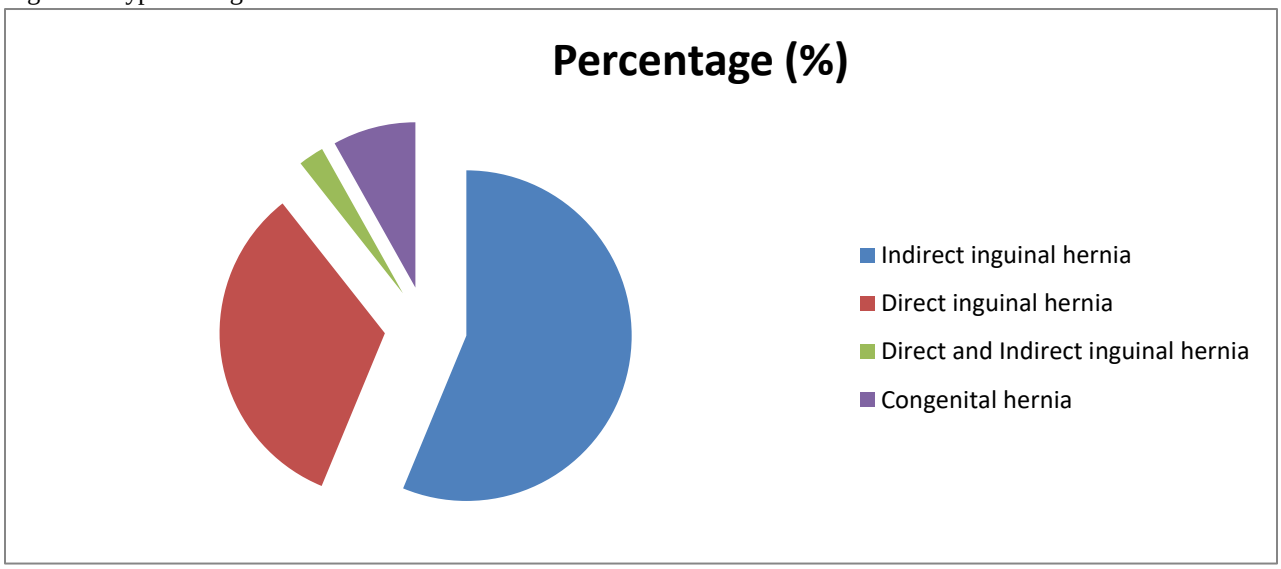
In this current study, swelling was the clinical presentation in all patients. Groin pain with swelling was seen in 21.87% of patients.

Table-5: Period of swelling.

Period of swelling	Number of patients	Percentage (%)
< 1 years	93	58.125
1-2 years	45	28.125
>2 years	22	13.75

Period of swelling was less than one year for majority of the patients, while the least of them had swelling for more than 2 years.

Figure 2: Types of inguinal hernia.



In the present study 56.25% patients were diagnosed as indirect inguinal hernia. Only 33.125% patients were diagnosed as direct inguinal hernia. In certain instances, an inguinal hernia's direct and indirect components were discovered (2.5%). In the paediatric age range, congenital hernias affected 13% of individuals.

Table-6: Side of inguinal hernia.

	Number of patients	Percentage (%)
Right	78	48.75
Left	46	28.75
Bilateral	36	22.50

Right inguinal hernias accounted for 48.75% of the cases in the current study, with left hernias coming in second at 28.75% and bilateral hernias at 22.50%.

Table-7: Content of inguinal hernia

Content	Number of patients	Percentage (%)
Omentum	110	68.75
Bowel loops	50	31.25

On the basis of ultrasound reports, the contents of the sac were the omentum in 110 (68.75%) patients and the small bowel in 50 (31.25%) other patients.

Table-8: Operative treatment of inguinal hernia.

Procedures	Number of patients	Percentage (%)
Open Herniotomy	9	5.625
Open Herniorrhaphy	14	8.75
Open Hernioplasty	137	85.625

The majority of inguinal hernias in the current study (85.6%) were treated with tension-free open mesh hernioplasty. Only 8.75 percent of the patients underwent open herniorrhaphy. For paediatric patients (5.6%) with congenital inguinal hernias, open herniotomy was the preferred technique.

IV. DISCUSSION

Over the last five years, from September 2018 to October 2023, a retrospective study was conducted at NIUM to examine statistical and demographic data related to patients with inguinal hernias. The study was conducted at the Surgery Department of the Medical Institute. During this period, the department received more than 3000 patients, out of which 160 (5.33%) were diagnosed with inguinal hernias.

An analysis of the data's age distribution shows that, in the current study, the age group 41–60 years old (43.125%) had the highest frequency of inguinal hernias, followed by the age group > 60 years old (25.625%) and the age group 21–40 years old (23.125%). This was consistent with a study conducted by Balram et al., which found that the age group of 42 to 50 was the most common.[6] This was in line with previous research by Sayanna et al. and Basu et al.[7,8] However, compared to patients between the ages of 21 and 40 (23.125%), patients over 60 had a slightly higher incidence (25.625%). Just 8.125% of the patients were in the 0–20-year-old paediatric and young age category. Patients who are middle-aged and older are at a higher risk of developing an inguinal hernia because of a variety of factors, including increasing intra-abdominal pressure and age-related weakening in the muscles of the abdominal wall.

According to the results (Table 2), out of a total of 160 cases, 157 were male and only 3 were female. This resulted in a male-to-female ratio of 9.81:0.18. The findings of this study are in line with previous research that also indicates a higher number of males than females affected. For instance, in Burcharth J.'s research, it was found that 90.2% of patients with inguinal hernias were male, while only 9.8% were female.[9] Similarly, Ruhl et al. also reported comparable results.[10] The reason for this could be that males and females have anatomical differences. Another reason is that women's workload was comparatively lower than men's, which meant that they were not exposed to greater physical activity as much as men. Due to various physical and vocational differences between men and women, inguinal hernias were less common in women. Men had a 15–27% lifetime risk of inguinal hernias, whereas women had only a 3% chance.[11]

According to the current study, the majority of risk factors for inguinal hernias include elevated intra-abdominal pressure from high weight lifting (33.75%), benign prostate hypertrophy (28.75%), persistent constipation (16.25%), and chronic cough/COPD (15%). Moreover, older age (25.62%) and prior inguinal operations (8.12%) are associated with greater weakening of the abdominal wall muscles. Two other risk factors linked to the hernia were diabetes and smoking. Sharma also found that 52.4% of participants in their study suffered hernias as a result of lifting heavy objects.[12] Studies have indicated that other risk factors include benign prostatic hypertrophy, persistent cough, and chronic constipation.[13,14,15] Medical comorbidities that increase intra-abdominal pressure, such as benign prostate hypertrophy, persistent cough, and persistent constipation, increase the risk of developing a hernia, particularly in elderly individuals who have decreased muscular tone and increased abdominal wall muscle weakness.

In the present study, 108 patients (67.50%) had normal BMI, 39 (24.35%) were overweight, 11 (6.875%) had low BMI, and only 2 (1.25%) had BMI over 30**.** By increasing abdominal pressure, obesity is theoretically hypothesized to be the cause of the increased incidence of inguinal hernias. However, most studies show that those who are overweight or obese have a lower chance of experiencing an inguinal hernia. Rosemar et al. found that for male patients with inguinal hernias between the ages of 47 and 55, a one-kg increase in BMI (from three to four kg) decreased the incidence of hernia by 4%.[16] In obese patients, the chance of inguinal hernia development is lowered to 43% as compared to those of normal weight. We found that inguinal hernia was significantly associated with normal BMI. Based on our study results, we recommend more large-scale studies to explore the association of BMI with inguinal hernia.

Swelling was the most common clinical symptom observed in the current study. All 160 patients who visited the surgery clinic had groin swelling. This is

consistent with the findings of Jenkins JT's research, which also identified groin swelling as the most frequent clinical manifestation.[17] In addition to swelling, 21.87% of the patients reported experiencing discomfort in the groin area.

Most of the patients (58.125%) had swelling for less than a year before they came to the hospital. According to research by Kumar et al., 68% of the patients experienced swelling that persisted for less than a year.[6] The reason for this is that a majority of individuals wait to seek medical assistance until their discomfort or pain interferes with their regular activities.

In this study, the majority of patients (56.25%) had an indirect hernia, while 33.125% had a direct hernia. Only a small percentage of patients (2%) had both types of hernias. Furthermore, 48.75% of the patients in this study had a right hernia, compared to 28.75% on the left and 22.50% on both sides. Similar observations were made in other studies, such as Nordback's research, which included 469 patients, of whom 207 had right-sided hernias, 146 had left-sided, and 116 had bilateral hernias.[18] In Gulzar et al.'s research, 64 out of 100 patients had right-sided inguinal hernias, which is consistent with the results of this study.[19] The right side predominance is due to the delayed descent of the testis and frequent failure of closure of the right processus vaginalis.[20,21] Based on reports from ultrasound scans, 110 patients (68.75%) had the omentum inside the sac, while 50 other patients (31.25%) had the small bowel inside.

In this study, tension-free open mesh hernioplasty was used to treat 85.625% of the inguinal hernias. Synthetic mesh has been shown to reduce the incidence of chronic discomfort and hernia recurrence significantly.[22] Only a small percentage of patients (2.7%) underwent open herniorrhaphy.

For pediatric patients (0.7%) with congenital inguinal hernia, an open herniotomy was the preferred technique. Our study did not involve any laparoscopic hernia repairs using the TEP or TAPP technique. Since laparoscopic inguinal hernia therapy became available, surgical professionals have been debating the merits of the open versus laparoscopic technique.

CONCLUSION

One of the most prevalent disorders observed in general surgery clinics among senior male patients is inguinal hernia. Heavy weight lifting and intense activity are two of the most common risk factors for inguinal hernias. Additionally, noted as risk factors were BPH, smokig, chronic obstructive pulmonary disease, abnormal bowel movements, or constipation. The majority of patients' BMIs were normal. The most typical clinical presenting style is inguinal swelling. Some of the patients had groin pain and swelling. There were more indirect hernias than direct ones. Bilateral inguinal hernias were the least prevalent, but right-sided hernias were more common than left-sided ones. Bowel loops were seen in the hernial sac after omentum in the majority of patients. Symptomatic hernia always warrants surgery as delay in treatment leads to complications. Patients should be educated for early operative treatment to prevent complications.

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Conflict of interest: None declared

V. REFRENCES

[1] John T Jenkins, Patrick J O'Dwyer. Inguinal hernias. British Medical Journal. BMJ 336 (7638): 269–272.

[2] Kingsnorth A, Leblanc K. Hernias: inguinal and incisional. Lancet. 2003; 362:1561-71.

[3] Burcharth J, Pedersen M, Bisgaard T, et al. Nationwide prevalence of groin hernia repair. PLoS One. 2013; 8(1): e54367. doi: 10.1371/journal.pone. 0054367. Epub 2013 Jan 14.

[4] 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(4):191-8.

[5] Oishi SN, Page CP, Schwesinger WH. Complicated presentations of groin hernias. Am J Surg. 1991 Dec;162(6):568-70; discussion 571.

[6] Balram. Prevalence of inguinal hernia in Bundelkhand region of India. Ann Int Med Den Res. 2016;2(3):137-8.

[7] Sayanna S. Prevalence of inguinal hernia in Indian population: a retrospective study. Med Pulse Int Med Journal. 2015;2(2):75-8.

[8] 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 Medical Gazette.2013:203-13.

[9] Burcharth J, Pedersen M, Bisgaard T, Pedersen C, Rosenberg J: Nationwide prevalence of groin hernia repair. PLoS One. 2013, 8: e54367. 10.1371/journal.pone.0054367

[10] Ruhl CE, Everhart JE: Risk factors for inguinal hernia among adults in the US population. Am J Epidemiol. 2007, 165:1154-61. 10.1093/aje/kwm011

[11] Gulzar, M.R., Iqbal, J., Ulhaq, M.I. and Afzal, M. (2007) Darning vs Bassini repair for inguinal hernia: A prospective comparative study. Professional Medical Journal. 2007; 14:128-133.

[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. 10.18203/2349-2902.isj20162208.

[13] Ruhl CE, Everhart JE. Risk factors for inguinal hernia among adults in the US population. Am J Epidemiol. 2007 May 15;165(10):1154-61. Epub 2007 Mar 20. DOI:10.1093/aje/kwm011.

[14] Lau H, Fang C, Yuen WK, et al. Risk factors for inguinal hernia in adult males: a case-control study. Surgery. 2007 Feb;141(2):262-6. Epub 2006 Jul 31. DOI: 10.1016/j.surg.2006.04.014.

[15] Junge K, Rosch R, Klinge U, et al. Risk factors related to recurrence in inguinal hernia repair: a retrospective analysis. Hernia. 2006 Aug;10(4):309-15. Epub 2006 May 23. DOI: 10. 1007/s 10029-006-0096-0.

[16] 16 Rosemar, A., Angerås, U. & Rosengren, A. (2008) Body mass index and groin hernia: A 34-year follow-up study in Swedish men. *Annals of Surgery*, 247, 1064–1068 [DOI: 10.1097/SLA.0b013e31816b4399] [PubMed: 18520236] [Google Scholar].

[17] Jenkins JT, O'Dwyer PJ: Inguinal hernias. BMJ. 2008, 336:269-72. 10.1136/bmj.39450.428275.AD.

[18] Nordback I: Side incidence of inguinal hernias. Ann Chir Gynaecol. 1984, 73:87-90.

[19] Gulzar, MR, Iqbal J, Ulhaq MI, Afzal M: Darning vs bassini repair for inguinal hernia: a prospective comparative study. Professional Med J. 2007, 14:128-33. 10.29309/TPMJ/2007.14.01.3639.

[20] Garba ES. The pattern of adult external abdominal hernias in Zaria. Nigerian J Sur Res. 2000; 2:12-5.

[21] Mbah N. Morbidity and mortality associated with inguinal hernia in northwestern Nigeria. West African J Medicine. 2007; 26:288-92.

[22] Scott NW, McCormack K, Graham P, et al. Open mesh versus non-mesh for repair of femoral and inguinal hernia. Cochrane Database Syst Rev. 2002;(4): CD002197. DOI:10.1002/14651858.CD002197.