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ORIGINAL ARTICLE

Inguinal hernia: A hereditary disorder.

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ABSTRACT… Objective: To determine that inguinal hernia is an inherited disease running in families. **Study Design:** Prospective Observational. **Setting:** Surgical Unit I & III of Ghulam Mohammad Mahar Medical College Hospital, Sukkur. **Period:** June 2017 to May 2022. **Methods:** A total of 1590 patients of inguinal hernia who presented to surgical OPD or emergency of GMMM College were included in the study. A detailed history was taken and examination done. Important parameters noted were age, gender, occupation, family history of inguinal hernia, degree of relative with inguinal hernia, type of inguinal hernia, primary or recurrent Hernia. **Results:** Out of total 1590 patients, 1499 (94%) were males and 91 (5.75%) females with male to female ratio of M: F=16.47:1 (Figure-1). Age ranged from 6 to 81 years with mean age of 52.32±15.25 years (Table-I). Out of 1590 patients, 1558 (97%) patients had primary while 32 (3%) had recurrent hernia. Out of 1590 patients, 1081 (68%) patients had direct hernia whereas 509 (32%) had indirect hernia; 843 (53%) were right sided, 722 (45.4%) left sided and 25 (1.6%) were bilateral hernia. Out of 1590 patients, 1312 (82.52%) had positive family history of inguinal hernia whereas 278 (17.48%) had negative family history for inguinal hernia. Out of 1312 with positive family history 971 (74%) patients had first degree relative with hernia, while 341 (26%) had 2nd degree relative with hernia (Table-II). Out of 32 cases of recurrent inguinal hernia, 22 (68.8%) had positive history of 1st degree relative with hernia, 9 (28.1%) had second degree relative with hernia whereas only 1 (3.1%) had negative family history for hernia. **Conclusion:** Our study concludes that family history of inguinal hernia poses a significant risk for developing hernia.

Key words: Direct Inguinal Hernia, Hereditary, Inguinal Hernia, Indirect Inguinal Hernia, Recurrent Hernia.

INTRODUCTION

Word "hernia" is of Latin origin meaning rupture. Hernia can be defined as, "An unnatural protrusion of a tissue or an organ through a flaw in the walls surrounding it". It can occur at different body sites but abdominal wall is the most common site for these defects especially the inguinal and umbilical regions.[1-2] Among other varieties, inguinal hernia accounts for 75% of all abdominal wall hernia.[3] Lifetime risk for acquiring the inguinal hernia is about 27% for male gender and 3% for females.[4] Like other hernias, inguinal hernia has a complex multifactorial etiology with both congenital and acquired factors playing part in causation.[5] Reported causes include basic weakness in the design, weakness caused by structures going in and out of the abdomen, failure of development, and weaknesses caused by genetic disorders of collagen and those caused by aging and pregnancy.[6] Inguinal hernia is considered to have hereditary causes; however a well-defined hereditary pattern is not demonstrated yet.[7] Family history of inguinal hernia is thought to increase not only the risk of developing this disorder but also increase tendency of recurrence and early recurrence.[8-9] Patients with family history of inguinal hernia have four times more risk of developing hernia as compared to those with negative family history of this disorder.[6] Generally when an inguinal hernia is developed, surgery is the main stay treatment and it can be done by open or laparoscopic approaches.[10] Inguinal hernia surgery is an extremely common operation performed by surgeons. Around twenty million inguinal hernia repair surgeries are performed per year worldwide.[6]

Since the inguinal hernia is a common condition

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which leads to decrease quality of life and increased economic burden on the individual and increased workload on the healthcare system; understanding the etiology of the condition would enable us to identify the at risk population and the measure to prevent this disease. This study was designed to determine that inguinal hernia is an inherited disease running in the families.

METHODS

This prospective observational study was conducted at Surgical unit I & III of Ghulam Mohammad Mahar Medical College Hospital Sukkur after approval from ethical committee (GMMMC/Suk/Esst: Branch/221) on 1590 patients of inguinal hernia. The duration of study was 5 years from June 2017 to May 2022.

Inclusion Criteria

- All the patients of inguinal hernia presenting to surgical OPD or emergency.
- Patients between 10 to 70 years.
- Patients of both the genders.
- Patients with primary and recurrent inguinal hernia.

Exclusion Criteria

- Patients under 10 years and above 70 years of age.
- All the patients with right inguinal hernia that developed after appendicectomy, orchidectomy and varicocele operations through inguinal approach.

Data Collection Procedure

All the patients of inguinal hernia who presented to surgical OPD or emergency of GMM Medical College Hospital Sukkur were included in the study. Informed and written consent was obtained to participate as study subjects. Permission was taken from hospital ethical review committee. A detailed history was taken and examination done. Important parameters noted were age, gender, occupation, family history of inguinal hernia, degree of relative with inguinal hernia, type of inguinal hernia, primary or recurrent hernia.

Data Analysis

Data was analyzed on SPSS V.24. Mean and standard deviation (Mean±SD) presented for continuous variables like age. Variables like gender, occupation, family history of inguinal hernia, degree of relative with hernia, type of inguinal hernia and primary or recurrent hernia were presented as percentage. P-value of < 0.05 was considered significant.

RESULTS

Out of total 1590 patients, 1499 (94%) were males and 91 (5.75%) females with male to female ratio of M: F=16.47:1 (Figure-1). Age ranged from 6 to 81 years with mean age of 52.32±15.25 years (Table-I). Out of 1590 patients, 1558 (97%) patients had primary while 32 (3%) had recurrent hernia. Out of 1590 patients, 1081 (68%) patients had direct hernia whereas 509 (32%) had indirect hernia; 843 (53%) were right sided, 722 (45.4%) left sided and 25 (1.6%) were bilateral hernia. Out of 1590 patients, 1312 (82.52%) had positive family history of inguinal hernia whereas 278 (17.48%) had negative family history for inguinal hernia. Out of 1312 with positive family history 971 (74%) patients had first degree relative with hernia, while 341 (26%) had 2nd degree relative with hernia (Table-II). Out of 32 cases of recurrent inguinal hernia, 22 (68.8%) had positive history of 1st degree relative with hernia, 9 (28.1%) had second degree relative with hernia whereas only 1 (3.1%) had negative family history for hernia.

Age Range	Mean±SD
6 – 81 Years	52.32±15.25 years

Table-I. Age of the patients

Type of Hernia	Positive Family History n (%)		Negative Family History n (%)	Total
	1st Degree Relative	2nd Degree Relative		
Primary Hernia	949 (60.9%)	332 (21.3%)	277 (17.8%)	1558
Recurrent Hernia	22 (68.8%)	9 (28.1%)	1 (3.1%)	32
Total	971	341	278	1590

Table-II. Association of hernia with positive family history

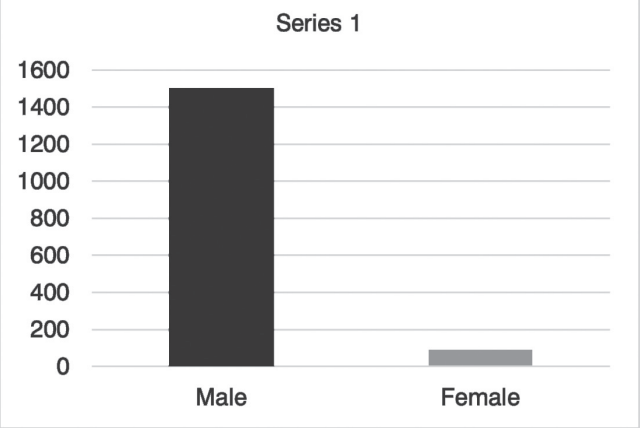

Figure-1. Gender distribution

DISCUSSION

Inguinal hernia has multifactorial etiology, it has long been considered as hereditary disorder however clear hereditary pattern has not been established yet.[7,11] Over a period of 5 years we collected 1590 patients of inguinal hernia and evaluated them for inheritance of disease from their families.

In our study age ranged from 6 to 81 years with mean age of 52.32 years. Most common age group was 45 to 55 years. In a study done at Al-Basra teaching hospital age ranged from 16 to 82 years with 31 years of mean age; most patients were above 40 years.[12] In another study most inguinal hernias belonged to 30 to 59 years age group.[13] In a study done on Nigerian population mean age was 47.3 years.[14] In present study most of the patients were male n=1499 (94%) with M:F=16.47:1. This is consistent with a study done by 12. Peng X et al. with M:F=7.1:1.[12]

In our study 97% patients had primary inguinal hernia (n=1558) while 3% (n=32) were recurrent, this is quite comparable to a study where 91.2% were primary hernia and 9.2% were recurrent.[12]

A Nigerian study showed that majority were indirect inguinal hernia (65.3%) as compared to direct hernia (34.7%) which is quite different to our results with 68% (n=1081) direct hernia and 32% (n=509) indirect hernia.[14]

Inguinal hernia runs in families; this is proved by our and many other studies. In our study, 53% patients had right sided hernias and similarly in a study done in Sahiwal 50% cases were of right sided inguinal hernia.[15] In present study 82.52% (n=1312) patients had positive family history of inguinal hernia, 74% (n=971) had first degree relatives while 26% (n=341) had 2nd degree relatives with inguinal hernia. Majority (96.9%) of patients with recurrent hernia had positive family history (31/32 patients).

In a Nigerian study, 43% patients had family history of hernia either in father, mother or first degree relative.[8] Ahmed Alenazi A et al. found positive family history of inguinal hernia in 20.8% population and similar observations found by Junge et al.[16-18] Christopher Barnett in his research found that increased risk of inguinal hernia was possibly due to disorders of collagen, elastin, microfibril and the glycosaminoglycan components of extracellular matrix.[11]

Burcharth J. also noticed that a positive family history for inguinal hernia poses an increased risk for not only the development of primary hernia but also hernia recurrence and significantly earlier recurrence.[19] Oberg S. also supported this view by his research that an inguinal hernia is linked with female-female inheritance pattern and plays a vital role in development of inguinal hernia in children3. S Sezer further went into the genetics and suggested that polymorphism of collagen type one alpha one gene is associated with a higher risk for developing inguinal hernia.[20] In a study done on Taiwan population concluded that development of inguinal hernia in adults is associated with EFEMP1 rs 2009262 TC/CC genotype in female gender and WT1 rs3809060 GT/TT genotype in male gender.[21]

CONCLUSION

- Inguinal hernia has multi factorial etiology both congenital and acquired factors are involved in causation.
- Our study concludes that family history of inguinal hernia poses a significant risk for developing hernia.
- Elective and emergency inguinal hernia repair is a common operation in general surgical

practice. Emergency surgery is associated with increased morbidity therefore identifying at risk population and diagnosing the disease early and operating on elective basis would reduce this morbidity and will improve the outcome.

- Therefore, we recommend further detailed insight in genetics of inguinal hernia in order to understand the actual underlying pathology.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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