

Predisposing factors and demographic analysis in inguinal hernia

Murat Kanlıoğlu¹, Ugur Ekici²

¹Lokman Hekim University Faculty of Medicine Department of General Surgery, Ankara, Turkey

²Istanbul Gelisim University, Faculty of Health Sciences, Department of Health Administration, Istanbul, Turkey

Copyright © 2019 by authors and Annals of Medical Research Publishing Inc.

Abstract

Aim: This study aims to identify the distribution of inguinal hernia by types, age and gender, and to find the correlation between inguinal hernia and chronic diseases, lifestyle and familial tendency.

Material and Methods: Of the patients admitted to our clinic, the following were recorded: age, gender, height, weight, body mass index (kg/m²), whether they do heavy labour or sports, chronic disease, direction of hernia, whether there is incarceration and strangulation and immediate family history of inguinal hernia. The data were analysed using the SPSS statistics software. $p < 0.05$ was considered significant.

Results: The study included 116 patients, of whom 12 (10.34%) were female and 104 (89.66%) were male. The mean age was 52.89 years, and the median age was 53.5 years. When the whole study group was evaluated, it was found that 5 (4.31%) of the patients had incarceration where 31 (26.72%) had family history, 36 (31.03%) had a history of chronic disease and 85 (73.27%) had a history of heavy labour/sports.

Conclusion: Whereas the rate of hernia history in the families of patients with inguinal hernia was 28.8% in males and 8.3% in females, the difference in-between was statistically significant ($p < 0.001$). Of the patients with inguinal hernia, the chronic disease rate was 31.7% in males and 25% in females, and the difference in-between was statistically significant ($p < 0.01$). Of the patients with inguinal hernia, the rate of doing heavy labour/sports was 78.6% in males and 41.6% in females, and the difference in-between was statistically significant ($p < 0.01$).

Keywords: Inguinal Hernia; Predisposing Factors; Demographic Data.

INTRODUCTION

Abdominal wall hernia is the subcutaneous repositioning of the abdominal organs along with peritoneum as a result of defects in the muscle and fascia layers that form the abdominal wall. Among those hernias, we examine inguinal and femoral hernias as inguinal hernias under the same heading. Inguinal hernias constitute 75% of the abdominal wall hernia. As age advances, the incidence of hernia in the community increases (1). Inguinal hernias are 9 times higher in males compared to females (2). However, femoral hernia was reported to be 3 times more common in females compared to males (3). In their study, Zimmerman et al. reported that, of all hernias in the USA, 83% are inguinal, 6% are femoral, 5% are incisional, 4% are umbilical, 1% are epigastric and 1% are other hernias (4).

The indirect hernia caused by non-closure of processus vaginalis usually appear in the newborn period. The indirect

inguinal hernia in adults, however, occur as a result of the expansion of the inner inguinal ring. These usually occur in middle-aged advanced age. The increased intra-abdominal pressure is the most important factor. Direct inguinal hernias are caused by the weakness of transversalis fascia. The factors that increase collagen synthesis defects and intra-abdominal pressure are important in the formation of direct inguinal hernia (5). In femoral hernias, however, the increased intra-abdominal pressure and the weakening of the femoral ring are the factors triggering hernia formation (1). In the diagnosis, swelling and pain are prominent in the history reported by the patient. Along with physical examination, radiological imaging techniques can also be used. When the treatment is basically gathered under three headings, we can summarize it as anterior and posterior conventional procedures and laparoscopic approaches. Today, laparoscopic approaches are prominent due to many advantages thereof.

Received: 27.12.2018 **Accepted:** 21.01.2019 **Available online:** 31.01.2019

Corresponding Author: Murat Kanlıoğlu, Lokman Hekim University Faculty of Medicine Department of General Surgery, Ankara, Turkey

E-mail: muratkanlioz@gmail.com

MATERIAL and METHODS

Along with their demographic data, such information of the patients admitted to our clinic (Malatya State Hospital, First General Surgery Clinic) with the diagnosis of inguinal hernia as the aspect of the disease, type of hernia, strangulation and incarceration status, family history, history of chronic disease and history of heavy labour/sports were recorded. The data were analysed by SPSS statistical software. The groups were compared by Chi-square test. $p < 0.05$ was considered significant.

RESULTS

The study included 116 patients, of whom 12 (10.34%) were females and 104 (89.66%) were males. The age range was 17 - 102 years in males and 20 - 80 years in females. The mean age was 52.89 years (standard deviation: 16.856) in the whole group, 48.67 years in females (standard deviation: 19.265), and 53.38 years in males (standard deviation: 16.856). The median age was 53.5 years in the whole group, 42.5 years in females and 56.5 years in males (Table 1).

Table 1. Distribution of inguinal hernia by age and sex					
Distribution of age statistics of patients by gender					
Gender	Average age (Year)	Standard Deviation (Year)	Youngest Age (Year)	Oldest Age (Year)	Median Age (Year)
Female	48.67	19.265	20	80	42.50
Male	53.38	16.651	17	102	56.50
Total	52.89	16.856	17	102	53.50

Of the patients, 59 had direct hernia which had a rate of 50.86% among all hernias. The number of indirect hernias was 40, including the scrotal hernia, and its rate was 34.48%. However, 13 patients had direct and indirect hernia with a rate of 11.2%. In patients, a total of four were found

to have femoral hernias, of which three were females, one was male, and the female-to-male ratio was three. Femoral hernias represent 3.44% of the hernia hernias. Of the 40 patients with indirect hernias in total, one was female and 39 were male. The female-to-male ratio was 1/9 in inguinal hernias and 1/40 in indirect hernias. Of the direct hernias, 10.16% were in female patients.

A total of 5 (4.3%) patients had incarceration. Of these, four were indirect, and one was femoral hernia. Of the patients with incarcerated hernias, one was female and four were male.

A total of 31 (26.72%) patients had an immediate family history of hernia. This rate was 22% in direct hernia, 38.88% in indirect hernia and 30.76% in direct (+) indirect hernias. There was no family history in scrotal and femoral hernias. Of 12 female patients, one had a family history of hernia, of which the rate was 8.3%, whereas 104 of the male patients had a family history of hernia and the rate was 28.8%. The difference in family history between males and females was statistically significant ($p < 0.001$).

A total of 36 patients (31.03%) had a history of chronic disease. This rate was 25% in females and 31.7% in males. The difference in-between was statistically significant ($p < 0.01$). This rate was 42.37% in direct hernia, 13.88% in indirect hernia, 23.07% in direct (+) indirect hernia, 50% in scrotal hernia and 25% in femoral hernia.

A total of 85 patients (73.27%) had a history of doing heavy labour in agriculture and animal husbandry and in various industries and of heavy sports. This rate was 41.6% in females and 76.9% in males. The difference in-between was statistically significant ($p < 0.01$). This rate was 76.27% in direct hernia, 72% in indirect hernia, 61.5% in direct (+) indirect hernia, 75% in scrotal hernia and 75% in femoral hernia. (Table 2).

Table 2. Factors affecting inguinal hernia types (n: number of patients)

		Type of Hernia					Total (n)
		Direct (n)	Indirect (n)	Direct(+) Indirect (n)	Scrotal (n)	Femoral (n)	
Gender	Female(n)	6	1	2	0	3	12
	Male(n)	53	35	11	4	1	104
	Total(n)	59	36	13	4	4	116
Incarceration	Yes(n)	0	2	1	1	1	5
	No(n)	59	34	12	3	3	111
	Total(n)	59	36	13	4	4	116
Family History	Yes(n)	13	14	4	0	0	31
	No(n)	46	22	9	4	4	85
	Total(n)	59	36	13	4	4	116
Chronic Illness History	Yes(n)	25	5	3	2	1	36
	No(n)	34	31	10	2	3	80
	Total(n)	59	36	13	4	4	116
Heavy Sports/Labour History	Yes(n)	45	26	8	3	3	85
	No(n)	14	10	5	1	1	31
	Total(n)	59	36	13	4	4	116

According to the patients' body mass index (kg/m²), the rates of those who are thin, normal, overweight and obese were found to be '1.7', '52.5', '42.2', '3.4%', respectively.

The number and rates of hernias according to their aspects are as follows: 65 (56.03%) right-sided, 43 (37.06%) left-sided, 8 (6.89%) bilateral.

DISCUSSION

The female-to-male ratio in our study was approximately 1/9 and it was consistent with the literature average (2).

In our study, direct hernia ratio was 50.86%. The rate of indirect hernia was, however, 34.48% including the scrotal hernia. The direct and indirect hernia rates were close to those in other studies (6). However, femoral hernia rate was 3.44%. In their study, Kurzer et al. reported the femoral hernia rate as 10%, whereas it was reported to be 6% in the study of Zimmerman et al. (7,4). In our study, we found the familial susceptibility to inguinal hernias more prominent in males. In their study, Ashinditiant et al. found that the males who had a family history of hernia were more likely to have inguinal hernia (8).

The rate of chronic disease history in male patients with inguinal hernia in our study was higher than that of the female hernia patients. We attributed this finding to the intensification of the male labour force in the industrial field. Likewise, Lau et al. found in their study that inguinal hernia formation was more common in patients with chronic obstructive pulmonary disease, high activity and family history of hernia (9).

We found in our study that the history of heavy labour and heavy sports were important factors in inguinal hernia. In their study, Kang et al. also found that the incidence of hernia was higher in those doing heavy labour (10). It can also be seen in the study of Sanjay et al. that doing heavy labour increases the likelihood of developing inguinal hernia (11). We believe that this has an effect on the increased intra-abdominal pressure with the performed

effort due to the high proportion of men in heavy labour sectors.

CONCLUSION

In those who do heavy labour, the risk of developing inguinal hernia is increased in males with a family history of hernia and chronic disease.

This study complies with the Declaration of Helsinki Criteria.

Competing interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports

Ethical approval: This work has been approved by the Institutional Review Board.

Murat Kanlioz ORCID: 0000-0003-4271-184X

Ugur Ekici ORCID: 0000-0002-2660-3120

REFERENCES

1. John T Jenkins. Inguinal hernias, clinical review. BMJ 2008;336.
2. Kingsnorth A, LeBlanc K. Hernias: inguinal and incisional. Lancet 2003;362:1561-71.
3. Cameron AM, Cameron JL. Inguinal hernia. In Current surgical heraphy. 7.edition. Mosby; 2001. p. 789-97.
4. Zimmerman LM. Recurrent inguinal hernias. Surg Clin North Am 1971;51:1317-24.
5. Brandt ML. Pediatric hernias. Surg Clin North Am 2008;88:27-43
6. Rutkow IM. Demographic and socioeconomic aspects of hernia repair in the United States in 2003. Surg Clin North Am 2003;83:1045-51.
7. Kurzer M, Kark A, Hussain T. Inguinal hernia repair. J Perioper Pract 2007;17:318-30
8. Ashinditiant JA, Ibrahim NA, Akinlolu OO. Risk factors for inguinal hernia in adult male Nigerians: a case control study. Int J Surg 2012;10:364-7.
9. Lau H, Fang C, Yuen WK, et al. Risk factors for inguinal hernia in adult males: a case-control study. Surgery 2007;141:262-6.
10. Kang SK, Burnett CA, Freund E, et al. Hernia: is it a work-related condition? Am J Ind Med 1999;36:638-44.
11. Sanjay P, Woodward A. Single strenuous event: does it predispose to inguinal herniation? Hernia 2007;11:493-6.