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Data analysis

Prevalence of hernia in relation to various risk factors in Narowal, Pakistan

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Abstract
Hernia is a common condition affecting both men and women since time immemorial. One hundred and ten cases of various types of hernia in hospitals of Narowal (Pakistan) had been analyzed to determine the relative occurrence and incidence of hernia, and effects of various risk factors. The analysis showed that inguinal hernias were more prevalent (70%, n=77/110), then Para umbilical hernia (14.54%, n=16/110), umbilical hernia (8.18%, n=9/110) and incisional hernia (7.27%, n=8/110). About 21.80% cases reports were belonging to the age class 51-60 years with a higher incidence of inguinal hernia. Hernia is more prevalent in males (67.27%) as compared to females (32.72%). In relation to various risk factors, inguinal hernia was the most prevalent. The prevalence of hernia is dependent on risk factors and independent in different age groups ($P<0.05$). The mortality rate in the current sample due to hernia is 1.81%. All these factors contribute to the development of hernia, but only one of them may be responsible for its cause.
Key words: Hernia, risk factors, human, prevalence.

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Introduction

Hernia is the protrusion of an organ through an abdominal opening in the muscle wall of the cavity that surrounds it [1]. It may be congenital or may result from the failure of certain structures to close after birth or may acquire later in life because of obesity, muscular weakness, surgery or illness [2]. The common sites of herniation are the groin, umbilicus, linea alba, semilunar line of spieghel, diaphragm and surgical incisions [3].

Hernia is of different types such as abdominal wall hernia, indirect inguinal hernia, direct inguinal hernia, femoral hernia, umbilical hernia, richter hernia, incisional hernia, spigelian hernia, obturator hernia, hiatal hernia, reducible hernia, incarcerated hernia and strangulated hernia [4]. Abdominal wall hernia is frequently encountered in surgical practices accounting for 15% - 18% of all surgical procedures [5]. Inguinal hernia occurs in the groin (the area between the abdomen and thigh). Umbilical hernia occurs through the umbilical fibro muscular ring [6]. The incisional hernia occurs in 2-10 percent of all abdominal operations, reducible hernia in which the contents of the hernia returns into the abdominal cavity, Irreducible hernia in which the contents of the hernia do not return into the abdominal cavity [7]. Strangulation is the most important and potentially threatening complication of hernia [8]. Hernias occur more often in children who have one or more of the following risk factors: a parent or sibling who had a hernia as an infant, cystic fibrosis, developmental dysphasia of the hip, undescended testes, abnormalities of the urethra, marked obesity, heavy lifting, coughing, straining with defecation or urination, ascites, peritoneal dialysis, ventriculoperitoneal shunt, chronic obstructive pulmonary disease (COPD) and family history of hernias [9].

To treat strangulated hernia, Cefoxitin (Mefoxin) antibiotic is often administered routinely if the ischemic bowel is suspected [10]. Surgery is the only way to repair hernia. First surgical repair of hernia was recommended in 1938 [11]. Surgery is done in many ways e.g. laparoscopic surgery, transabdominal peritoneal hernia surgery (TAPP) and totally extraperitonial surgery (TEP). In most instances, transabdominal surgery is indicated through upper midline, subcostal or paramedian incisions [12]. The technical name of operation that repairs hernia is called herniorrhaphy. Sometimes the weak area is reinforced with steel mesh or wire. This operation is called hernioplasty. Hernias do not correct themselves over time and can often deteriorate, with enlargement of the hernia and increasing discomfort [13].

The objective of the current study was to survey the hospitals of Narowal, Pakistan to determine the prevalence and incidence of hernia in relation to various risk factors such as age, sex, obesity etc.

Materials and methods

The prevalence of hernia was determined in 110 samples of patients. The data of patients suffering from hernia and operated for hernia was collected from the

surgical wards of hospitals of Narowal (Pakistan). For the purpose of collecting patient history a Performa was developed. The performa included information regarding age, sex, hereditary factors, repeated pregnancies, constipation, heavy lifting, absence or presence of obesity, cough, smoking, abdominal surgical history and related infections. Data obtained was tabulated using Microsoft Excel (MS Excel 2010, Microsoft Corporation). Statistical analyses were performed using SPSS version 16.0 statistical software (SPSS, Chicago, IL)

Results and discussion

The results of our study revealed that among 110 patients studied, a higher prevalence of inguinal hernia (70%) as compared to para umbilical (14.54%), umbilical (8.18%), incisional (7.27%) and femoral hernia (0%) was found (Fig. 1). Our results are in accordance with Sangwan et al. [14] who demonstrated 76.35% prevalence of inguinal hernia, 12.38% prevalence of para umbilical hernia, 3.95% prevalence of umbilical hernia and 2.7% prevalence of incisional hernia in Pakistan.

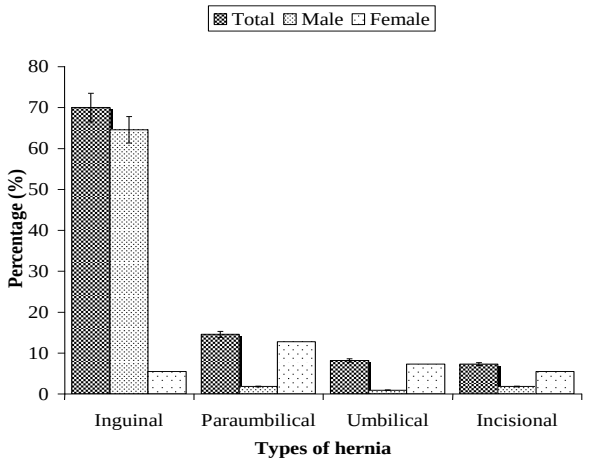

Fig. 1: Percentage of types of hernia in patients of Narowal, Pakistan

Among 70% cases of inguinal hernia, 92.20% were males and 7.79% were females. About 64.93% of the inguinal hernias occurred on the right side while 25.97% occurred on the left side and 9.09% cases had bilateral inguinal hernia. Russel et al. [15] found a 57% incidence of inguinal hernia. Para umbilical hernia had an incidence of 14.54%. Females had a higher incidence of 87.50%, whereas males had an incidence of 12.5%. Umbilical hernia had an incidence of 8.18%. Females had a higher incidence of 88.88%, whereas males had an incidence of 11.22%. Ginsberg and Sharma [9] reported a 15% incidence of umbilical hernia. The incidence of incisional hernia (7.27%) was quite low compared to inguinal and Para umbilical hernia. Females had a higher incidence of 75%, whereas males had an incidence of 25%. Solandi et al. [16] found the male to female ratio of incisional hernia 1:3. Out of 110 patients, there was no case of femoral hernia. Thus, these results showed that the incidence rate of femoral hernia was very low and it was not that common as compared to the other types of hernia.

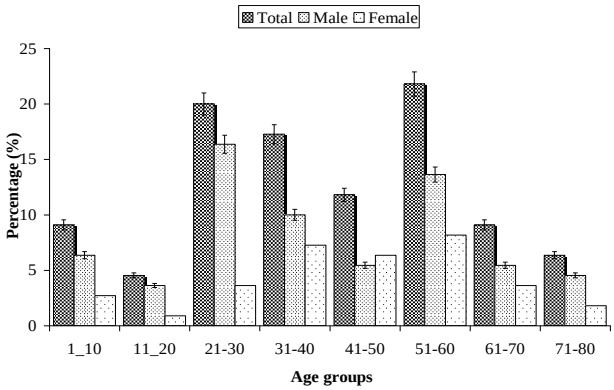

Fig. 2: Age and sex specific prevalence of hernia in patients of Narowal, Pakistan

The prevalence of hernia is dependent on risk factors. These include sex, age, cough, constipation, repeated pregnancies, obesity, smoking, heavy lifting, prior operations and hereditary factors. There was a higher incidence of hernia in males (67.27%) than females (32.72%). Similarly, it was found out in other studies that girls have a much lower rate of hernia than boys [17]. In patients of the inguinal hernia Khattak and Ali [18] found that 97.56% were males and 2.44% were females whereas Velanovich et al. [19] reported an incidence of 85% in males and 15% in females.

The incidence of hernia was the highest (21.80%) among the age group of 51-60 years out of which males (62.50%) had a higher incidence than females (37.50%) as shown in the Fig. 2. In this age group, the incidence of inguinal hernia was higher (66.66%) as compared to umbilical (22.22%), para umbilical (5.55%) and incisional hernia (0%). The prevalence of hernia is independent of different age groups.

The incidence of hernia was highest (18.18%) among females who had repeated pregnancies among which 50% had para umbilical hernia, 20% had umbilical, 15% had inguinal and 15% had incisional hernia. Lubin et al. [20] also reported that repeated pregnancies are common precursor or risk factor of umbilical hernia in adults (Table 1).

The incidence of hernia among males and females who had previous operations was 16.36%, among which 66.66% were males and 33.34% were females. About 66.66% had inguinal hernia, 16.66% had

Table 1: Prevalence of different types of hernia (%) in relation to various risk factors

Risk factors	Types of hernia				
	Total	Inguinal	Para umbilical	Umbilical	Incisional
Repeated pregnancies	18.18	2.72	9.09	3.63	2.72
Prior operation	16.36	10.9	1.81	0.9	2.72
Smoking	13.63	13.63	0	0	0
Constipation	12.72	7.27	2.72	1.81	0.9
Heavy lifting	6.36	5.45	0	0	0.9
Cough	5.45	4.54	0.9	0	0
Hereditary factors	24.54	24.54	0	0	0
Obesity	2.72	0.9	0	0	1.81

incisional, 11.11% had Para umbilical and 5.55% had an umbilical hernia.

The incidence of hernia was higher among males who were addicted to smoking (13.63%). The risk factor of smoking was not found in females. All of these males had an inguinal hernia. Smokers have a fourfold risk of hernia [21]. Studies of connective tissue from patients with inguinal hernia have shown that smoking may be associated with hernia formation due to a defective connective tissue metabolism [22].

The incidence of hernia among patients who had constipation problems was 12.72% out of which 57.14% were males and 42.86% were females. Among patients having a history of constipation, the incidence of inguinal hernia, (para umbilical 21.42% and umbilical 57.14%), and incisional hernia was 14.28% and 7.14%, respectively. In the evaluation of risk factors of incisional hernia, Solandi et al. [16] reported that 11.54% cases had a history of raising intra-abdominal pressure.

The incidence of hernia in patients doing heavy work was 6.36%, among which 85.71% were males and 14.28% were females. Among these patients, 85.71% had inguinal hernia whereas 14.28% have incisional hernia. The incidence of hernia in patients having problems of coughing was 5.45%, among which 66.66% were males and 33.34% were females.

Among these patients, 83.33% had inguinal hernia and 16.66% had Para umbilical hernia. The incidence of hernia in patients having family histories was 24.54% and they were all males and had inguinal
hernia. A positive family history points towards a relatively weak anatomy [23].

The incidence of hernia in obese patients was 2.72% and they were all females. Among these females,
66.66% had incisional hernia and 33.33% had inguinal hernia. In a similar study in Jerusalem, the prevalence of hernia was low in the presence of overweight or adiposity suggesting that obesity is a protective factor [24]. Similarly, no relationship was found between obesity and umbilical hernia [25]. In his study on incisional hernia, Solandi et al. [26] found 17.31% obese cases [16]. Obesity is statistically an insignificant risk factor.

The chief complaints reported by the patients were swelling (92.72%), pain (49.09%), vomiting (10.90%) and fever (8.18%). About 30.90% patients had an increase in the size of their hernia. Among the patients, 76.36% hernias were reducible, 23.63% were irreducible, while 66.36% were direct and 33.63% were indirect.

Table 2: Recurrence rate of hernia and mortality rate due to hernia.

Parameters	Total %	Male %	Female %
Recurrence rate	9.09	8.18	0.9
Mortality rate	1.81	0.9	0.9

Among the 110 cases, 9.09% experienced recurrent hernia out of which 90% were males and 10% were females (Table 2). All the patients with recurrent hernia experienced inguinal hernia. In a study, the overall recurrence rate was 30.30% [27] and smoking and age were the major risk factors for recurrence [28]. According to a study, women had a significantly higher recurrence rate than men [29].

In the present study all the patients went through surgery and 98.18% were improved and able to return to their normal life routines. The mortality rate in the present study was 1.81%. Two patients died out of which 1 patient was a female (70 years) and 1 was a male (22 years). In a study, the overall mortality of patients with strangulated hernia was 14% [30].

Conclusions and suggestions

Among various types of hernia, prevalence of inguinal hernia is more and incisional hernia is less in the representative population of Narowal (Pakistan). Hernia is more prevalent in males as compared to females of all races. Disease occurs more frequently in 51-60 years of age group. Early diagnosis of the disease and proper provision of medication is the need of the hour.

Epidemiological studies should be planed occasionally to check the occurrence rate of such chronic and disabling diseases. Such studies in developing countries like Pakistan have two purposes. One is to determine and then to promote the extent of the problem in order to stimulate the provision of appropriate service. The other is to compare the results with similarly acquired information from the developed world in search of extrinsic causative factors.

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