RISK FACTORS OF HERNIA IN HADRAMOUT-YEMEN - A CASE CONTROL STUDY

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Introduction

A hernia is a protrusion of viscous or part of viscous through an abnormal opening in the wall of its containing cavity. (1)

According to the site, hernias are classified into: inguinal hernia which is the commonest type that occurs at all ages, femoral, umbilical and incisionl hernias . (2) Also, there are an unusual hernias like epigastric, Richter's, Littre's spigelian, obturator, Lumbar, sciatic and Perineal hernias. (3)

Cough ,constipation ,pregnancy ,obesity and unusual exertion especially heavy lifting weight and heavy exercise are listed as causes of increased intra-abdominal pressure and therefore, they are considered as risk factors of hernia(4). However, recent work suggests that these conditions do not cause hernia on there own but may be additional facilitating factors acting on the basic etiology to bring on a hernia such as family history and smoking (5).

Chronic cough is defined as cough that persists for more than three weeks.Chronic bronchitis secondary to cigarette smoking is probably the most common cause of chronic cough (6).

Constipation has different meaning for different people and is often arbitrarily

defined depending largely on patient precipitation of alteration in his or her bowel function. Among patients who report having constipation, common bowel movement pattern include straining at stool 52%, passage of hard stool 44%, inability to defecate when desired 34% and infrequent defecation33% (7).

Obesity is a heavy accumulation of fat in the body's fat cells to such a serious degree that is rapidly increases the risk of obesity-associated disease and mortality. An excellent method to measure

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obesity and overweight is the body mass index (BMI).People of average weight are considered to have a BMI between 18.5 and 25 kg/m2 and people with a BMI of 25 to 30 kg/m2 are considered overweight , while people with a BMI of over 30 kg/m2 are considered obese [8].

The smokers were equally divided among heavy smokers 20 to 40 cigarettes per day and chippers who smoked 5 or fewer cigarettes per day. Compared with heavy smokers, chippers have less intense craving for their first cigarette of the day and can more comfortably avoid smoking in situations where it is not permitted [9].

The picture about hernia in Yemen is unclear , yet there is a study in United States about hernia shows that hernia repair is one of the most commonly performed surgical procedures in the United States. Each year more than 750.000 hernias are treated, while and even greater number go unrepaired. It has been reported that 2% of the American population have hernia. This means there are 5 million people with hernia in the country [10].

Methodology

A prospective hospital-based case-control study was conducted among patients admitted in Al-Mukalla public and private hospitals in the period from November 2006 to May 2007 .

The sample size of this study was calculated by using the epi-info program based on the following indications, alpha level (0.05), power (80%), controls with exposure 40%, controls: cases (1:1), cases with exposure 60%, OR (3).So the total sample size is 124 patients, selected as 62 patients with hernia as a case group and other 62 patients with no hernia as a control group. The sample selected randomly, males and females of more than 15 years.

The cases defined as patients who admitted in the hospitals and polyclinics with symptoms and signs of hernia such as: swelling in certain sites (hernia orifices), cough impulse and reducibility, they were diagnosed by surgeons. While the controls defined as patients who admitted in the hospitals and polyclinics and never have had these criteria.

The data collected from the three main hospitals in Al-Mukalla city (one public and two private hospitals) and from three private polyclinics

The patients were interviewed by using a questionnaire prepared for this purpose.

The data summarized and analyzed manually and by using Excel program. Special statistical elements are used as odd ratio (OR), confidence interval $_{95\%}$ ($CI_{95\%}$), and alpha level 0.05 (P value 0.05).

Results

Heavy work has a significant association with the development of hernia OR = 3.73, the (CI) 95% = 1.64-8.58, and the P value= 0.001. **Table No.(1)**

Positive family history of hernia has no significant association with the occurrence of the hernia OR = 2.1, the (CI) 95% = 0.70-6.35 and the P value 0.0**7. fig. No. (1)**

Obesity is twice more among cases with hernia than those who have no hernia OR=2 while C I 95% =0.81-4.92 and P value 0.06, yet there is no statistically significant relation with hernia.

Chronic cough is four times more common among cases with hernia than those who have no hernia OR=3.8, CI 95%=1028-11.85 and P.value=0,012, it is considered as a significant risk factor of hernia.

And according to this study chronic constipation is a significant risk factor, since OR=4, CI 95% =1.24-13.5 and P value=0.01, see **table No.(2).**

The behavioral risk factors that have been studied in this research have no significant association with development of hernia **table No.(3),** and this described as following: _

Lifting heavy weight is 1.4 times more among cases of hernia than those who have no hernia, OR=1.4, but CI =0.64-3.22 and P value 0.07.

Heavy exercise is 1.9 times more among cases with hernia than those who have no hernia, OR=1.9, CI=0.55-7.17 and P value 0.07.

Smoking as a habitual factor is 1.7 times more among cases with hernia than those who have no hernia, OR=1.7, CI=0.63-4.45 and

P value 0.06.yet it has no statistically significant relationship with the development of hernia. **Table no (3)**

Discussion

There are several studies that give some clues about the association between hernia and certain risk factors.

Heavy work is a significant risk factor according to this study and this coincides with the result of Hong Kong study done between January 2002 and January 2004 about risk factor of inguinal hernia (P =0.03) [(11).]

Positive family history is not a significant risk factor according to our study, this correlated well with study in Netherlands about inguinal hernia (OR=4.3, 95% CI 1.9-9.7) [(12)], but it appears as a risk factor of hernia in Hong Kong study where a male subject who has a positive family history of hernia is 8 times more likely to develop a primary inguinal hernia (P=0.01, OR=8.73) [(11).] It could be related to unreliable history given by the patients who, sometimes, are not remembering the exact history of hernia in his or her family.

32% of cases are obese according to this study and they were estimated by observation and by patient and relatives assessment because we have no weight and height measurement in surgical unit on admission, so BMI could not be obtained. Yet obesity is not a significant risk factor, while Netherlands study showed that the obesity is protective for inguinal hernia (OR=0.2, 95% CI 0.04-1.0) [(12).]

Chronic cough is a risk factor according to present study, the same result was obtained by study done in India about transdiaphramatic intercostals hernia [(13)] and other in Spain said that this symptom is a significant factor (P=0.001) [(14)] ,while a North American study does not agree with them [(15)] . Other significant risk factor was chronic constipation, also study done in Khartoum between 2001-2003 about evaluation of potential causes of hernia consider it as a risk factor associated with hernia [(16)].

Smoking is not a significant risk factor of hernia according to our study , while there is a higher percentage of smokers than nonsmokers develop groin hernias and recurrence after repair according to the study which had been done in Khartoum. [(16)] Read

has shown that smokers have higher circulating serum elastolytic activity than controls in addition to systemic protease/antiprotease imbalance in cigarette smokers leads to fascial degeneration, interference with normal wound healing , and an increased rate of recurrence of repaired hernias. [17]

Heavy exercise is not found to be a significant risk factor, this correlated well with study in Netherlands which said that they are not associated with inguinal hernia(OR=0.2, 95% CI 0.1-0.7) [12] .

According to this study lifting heavy things is not significant risk factor, while Spain study consider lifting heavy objectives repeatedly over long period time was the only significant risk factor (OR = 2.92, 95% CI 2.11 to 4.04.) [14].It could be related to the minimum weight which can be considered as heavy weight and the time duration of lifting that weight .

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Table No. (1): Association of occupation with hernia among patients admitted in Mukalla hospitals and privates in 2006-2007.

Occupation	Case	Control	OR	C.I 95%	P.value
Heavy work	46	27	3.73	1.64-8.58	0.001
Light work	16	35			

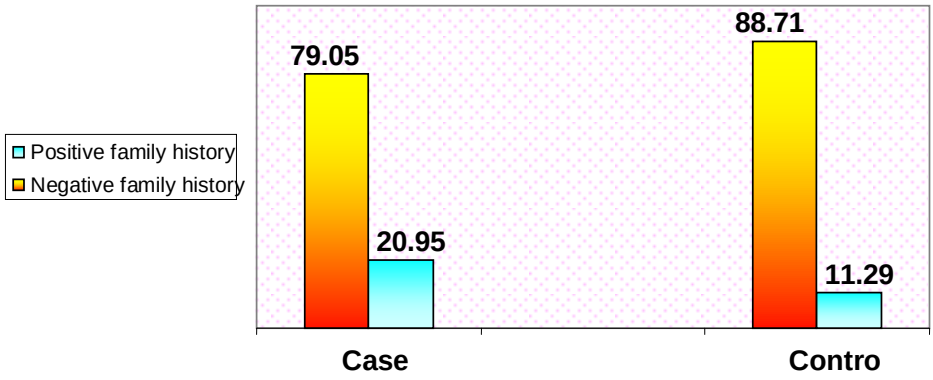
Table No. (2): Association of health risk factors with hernia among patients admitted in Al-Mukulla public and private hospitals and polyclinics at Nov. 2006 – May 2007.

Risk factors	Case	Control	OR	CI95%	P.value
Obesity					
Yes	20	12	2	0.81 – 4.92	0.06
No	42	50			
Chronic cough					
Yes	18	6	3.82	1.28 – 11.85	0.012
No	44	56			
Chronic constipation					
Yes	16	5	4	1.24 – 13.5	0.01
No	46	57			

Table No. (3): Association of behavioral and habitual factors with hernia among patients admitted in Al-Mukulla public and private hospitals and polyclinics at Nov. 2006 – May 2007.

Risk factors	Case	Control	OR	$CI_{95\%}$	P.value
Smoking **Yes** **No**	15 47	10 52	1.66	0.63 – 4.45	0.06
Lifting heavy things **Yes** **No**	43 19	38 24	1.4	0.64 – 3.22	0.07
Heavy exercises **Yes** **No**	9 53	5 57	1.94	0.55 – 7.17	0.07

Figure No. (1): Association of family history with hernia among patients admitted in Mukalla hospitals and privacies in 2006-2007.


Association of family history with hernia
Positive family history
Negative family history
79.05
20.95
88.71
11.29
Case
Contro