International Journal of Research in Medical Sciences
Bharata B et al. Int J Res Med Sci. 2020 Dec;8(12):4247-4250
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20205298

Original Research Article

The relationship between obesity and obstruction risk of lateral inguinal hernia at Negara general hospital in 2019-2020

Bagus S. Bharata*, Gita B. Triarta

Department of surgery, Negara General Hospital, Negara, Bali, Indonesia

Received: 07 October 2020
Revised: 10 November 2020
Accepted: 11 November 2020

***Correspondence:**
Dr. Bagus S. Bharata,
E-mail: sastra402@gmail.com

ABSTRACT

Background: A hernia is the protrusion of the abdominal contents from the normal cavity through a defect in the fascia and aponeurotic muscle of the abdominal wall, either congenital or acquired. The hole can arise because the embryonic opening does not close or widen, due to high intra-abdominal pressure caused by chronic coughing, heavy lifting, overweight, obesity, and weakness of the abdominal wall muscles. The incidence of inguinal hernias is higher in patients with body mass index (BMI) who are overweight and obese than those with normal body weight. A study that conducted by Sneiders et al stated that each increase of 1 kg/m^2 BMI would increase the risk of hernia complications by 1.03 times (p=0.03).
Methods: This study used a cross-sectional analytic study. The samples were determined by consecutive sampling. In this study, the sample used was patients with a diagnosis of inguinal hernia who were divided based on the presence or absence of complications and divided according to BMI, then saw whether there was a relationship between BMI in the obesity category and the incidence of complication inguinal hernia. This study uses data from medical records at the Negara General Hospital from 2019-2020.
Results: This study used 79 respondents of hernia patients at the Negara General Hospital who met the inclusion criteria and did not meet the exclusion criteria. There were 77 people (97.5%) male respondents and 2 (2.5%) female respondents with a mean age of 53.05 years (SD±19.7 years). As for the underweight body mass index there were 6 people (7.6%), normal as many as 41 people (51.9%), overweight as many as 4 people (5.1%), and obese as many as 28 people (35.4%). The diagnosis of reducible hernia was 52 people (65.8%), 21 people (26.6%) incarcerated hernia, 5 non-reducible hernias (6.3%) and 1 strangulated hernia (1.3%).
Conclusions: The conclusion of this study indicates a significant relationship between BMI and the incidence of complicated hernias. Obese hernia patients were 7.2 times more likely to develop hernia complications than non-obese patients.

Keywords: Hernia, Inguinal hernia, Obesity

INTRODUCTION

A hernia is the contents protrusion of the stomach from the normal cavity through a defect in the fascia and aponeurotic muscle of the abdominal wall, either congenital or acquired, which allows passage of any organ other than the usual through the wall. The hole can arise because the embryonic hole does not close or expand, due to the increased intra-abdominal pressure. The things could increase the intra-abdominal pressure such as chronic cough, constipation, strenuous exercise, heavy work, overweight, and obesity as well as weakness of the abdominal wall muscles such as gender, genetics,

and old age. The incidence of inguinal hernias is higher in patients with body mass index who are overweight and obese than those with normal body weight. Data from the Indonesian Ministry of Health states that based on the distribution of gastrointestinal system disease inpatients according to the cause of illness in Indonesia in 2004, hernias rank 8th with a total of 18,145 cases, and 273 of them died. Of these, 15,051 cases occurred in men and 3094 cases occurred in women.[1,2] Lateral inguinal hernia often becomes a complication in people who have a BMI exceeding normal limits. In the study of Sneiders et al a prospective study with 4,472 subjects, obtained conclusions similar to this study. The study showed that each increase of 1 kg/m^2 BMI, would increase the risk of hernia complications by 1.03 times (p=0.03).[3]

The pathogenesis of a hernia is due to the incompleteness of the inguinal canal and can be cause by various factors.[4-6] If the canal opening is partially open, a hydrocele will arise. If the canal continues to open, because the processus does not obliterate, a congenital lateral inguinal hernia will develop. Hernias in adults occur usually because of old age, caused the muscles of the abdominal cavity wall weaken. As we get older, our organs and tissues undergo a degeneration process. In elderly, the canal has closed. However, because this area is a locus minoris resistance, in conditions that cause increased intra-abdominal pressure, such as chronic cough (COPD), prostate enlargement, obesity and lifting heavy objects and straining. Canals that have been closed can open again and a lateral inguinal hernia arises.[4-6]

The purpose of this study is to determine, how much obesity can affect the incidence of complications in lateral inguinal hernia.

METHODS

The research design that will be used in this research is an analytical study. The research design used was a cross sectional study. The variables in this study design were only conducted once at one point in time. The samples were determined by consecutive sampling.

This research took place at the Negara General Hospital, Bali. In January 2020-September 2020.

The population in this study were hernia patients at the State General Hospital in 2019. The sample size used in this study was 79 respondents. In sampling, the inclusion criteria used were: all patients with a diagnosis of lateral inguinal hernia at the Negara General Hospital, whose data from their medical records were complete. The exclusion criteria were: patients whose medical records were incomplete.

The procedure that was carried out before taking data at the research site, the researcher submitted a research proposal and submitted a permit application to conduct research at the Negara General Hospital, Bali.

Method that used for collect the data was medical record. The medical records that met the criteria was recorded and sorted. The data obtained were then processed using the SPSS (statistical product and service solutions) program. Then the processed data is presented in the form of a frequency distribution table, which is then analysed analytically to provide an overview of the relationship between BMI and complications in lateral inguinal hernia.

RESULTS

This study used 79 respondents of hernia patients at the Negara General Hospital who met the inclusion criteria and did not meet the exclusion criteria. There were 77 people (97.5%) male respondents and 2 (2.5%) female respondents with a mean age of 53.05 years (SD±19.7 years). As for the underweight body mass index there were 6 people (7.6%), normal as many as 41 people (51.9%), overweight as many as 4 people (5.1%), and obese as many as 28 people (35.4%). The diagnosis of reducible hernia was 52 people (65.8%), 21 people (26.6%) incarcerated hernia, 5 non-reducible hernias (6.3%) and 1 strangulated hernia (1.3%). Table 1 shows the characteristics of the respondents in this study.

Table 1: Characteristic of hernia patients at Negara General Hospital in 2020.

Characteristic	Frequency (%)	Mean (±SD)
Sex		
Male	77 (97.5)	
Female	2 (2.5)	
Age		53.05 (±19.7)
Body Mass Index (BMI)		
Underweight	6 (7.6)	
Normal	41 (51.9)	
Overweight	4 (5.1)	
Obese	28 (35.4)	
Type of Hernia		
Reducible	52 (65.8)	
Incarcerated	21 (26.6)	
Non-reducible	5 (6.3)	
Strangulated	1 (1.3)	

In the obese group, the mean age was 57.3 years (SD±16.2 years) meanwhile, the non-obese group had a mean age of 50.7 years (SD±21.1 years). The independent mean difference analysis t-test showed a significantly different value with p=0.019. Patients in the obese BMI group were significantly older in mean than those in the non-obese BMI group. Most of the respondents aged <65 years are non-obese (67.3%) and most of the respondents aged ≥65 years are also non-obese (58.3%). Men made up the majority in the non-obese group (64.9%) while the obese group consisted of 27 people (35.1%). There was one woman each in the obese and non-obese groups.

Based on hernia type variable, out of 22 respondents with complicated hernias, there were 15 (68.2%) obese respondents and 7 (31.8%) non-obese respondents. Meanwhile, of the 57 respondents with hernia without complications, there were 13 (22.8%) obese respondents and 44 (77.2%) were non-obese respondents. In the chi-square analysis, the relationship between BMI and complications of hernias was obtained R^2=14.2 with p=0.0001. In the analysis of risk estimation on this variable, the results obtained prevalence risk (PR): 7.2 with a confidence interval (95% CI): 2.4-21.5. It can be concluded that obese patients have a 7.2 times greater risk of developing a complicated hernia compared to non-obese patients. The result of this variable relationship is statistically significant with a value of p=0.0001 (Table 2).

Table 2: The relationship between respondents' demographics and BMI.

	BMI Category		P value
	Obese	**Non-obese**	
Age mean±SD	57.3±16.2	50.7±21.1	0.019*
Age			0.445
<65 years old, n (%)	18 (32.7)	37 (67.3)	
≥65 years old, n (%)	10 (41.7)	14 (58.3)	
Sex			0.663
Male, n (%)	27 (35.1)	50 (64.9)	
Female, n (%)	1 (50)	1 (50)	
Type of hernia			0.0001*
Complication, n (%)	15 (68.2)	7 (31.8)	
Without complication, n (%)	13 (22.8)	44 (77.2)	

BMI=Body mass index; SD=Standard deviation; *p=<0.05

DISCUSSION

The mean age of obese patients which is higher than non-obese in this study is in accordance with the epidemiology of the obese population whose highest prevalence occurs at the age of 50-65 years and decreases after that age.[7] This is possible because the metabolic rate of the elderly population decreases, while food consumption daily is fixed so obesity often occurs at this age.

Male became the most experienced inguinal hernia compared to women (77 versus 2). This is in accordance with the literature which states that men are 8-10 times more likely to experience inguinal hernias than women.[8] This result occurs because of differences in the developmental processes of male and female reproductive organs during the fetus. At 2-8 months of pregnancy, there is a testicular descent through the canal. The descendant of the testis will pull the peritoneum into the scrotum area, causing a peritoneal bulge called the processus vaginalis peritonei. When the baby is born, the processus is generally obliterated, so that the contents of the abdominal cavity cannot pass through the canal. But in some cases, it is often not closed, because the left testicle descends first from the right, the right inguinal canal opens more often. Under normal circumstances, this open canal will close at the age of 2 months.[4-6]

In the adult population, inguinal hernias are reported to be more common in the thin older male population.[8,9] However, the risk factors for developing hernias and the risk factors for hernia complications (incarcerated and strangulated) are different. The risk of a hernia becoming incarcerated or strangulated is associated with raised intra-abdominal pressure.[10] Obesity, ascites, chronic cough, and constipation have been widely reported to increase intra-abdominal pressure and therefore also increase the risk of hernia complications.[10-13] This is appropriate with the results of this study which showed a significant relationship between BMI and the incidence of hernia complications. In that study, obese hernia patients were 7.2 times more likely to develop hernia complications than non-obese patients. In the study conducted by Sneiders et al a prospective study with 4,472 subjects, got a conclusion similar to this study.[3] The study showed that each 1 kg/m^2 BMI increase would increase the risk of hernia complications by 1.03 times (p=0.03).[3] In this study, it was found that obese patients were 7.2 times more likely to develop complications, in Sarkhosh's study, it was found 2.95 times more risky, it was found that it was much higher in this study, maybe because this study used consecutive sampling, and used difference in the number of samples.

Limitations

The limitations of this study are that the number of samples is less representative of a much more diverse population, and the sampling uses consecutive sampling technique, which with this technique can make the incidence of complications in obese lateral inguinal hernia is higher than other studies.

CONCLUSION

The incidence of complications in inguinal hernias often occurs in patients who have a BMI above normal. This study found a significant relationship between BMI and the incidence of complicated hernias. Where obese hernia patients were 7.2 times more likely to develop hernia complications than non-obese patients. in this study, the risk of complications was much greater than in other studies, this may be due to differences in the number of samples and the type of study used.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Norton JA. Hernias and Abdominal Wall Defects. Surgery Basic Science and Clinical Evidence. Springer. 2001;787-803.
2. Depkes RI. Distribusi Penyakit Sistem Cerna Pasien Rawat Inap dan Rawat Jalan Menurut Golongan Sebab Sakit di Indonesia. 2004.
3. Sneiders D, Yurtkap Y, Kroese L, Kleinrensink G, Lange J, Gillion J. Risk Factors for Incarceration in Patients with Primary Abdominal Wall and Incisional Hernias: A Prospective Study in 4472 Patients. Wor J Surg. 2019;43(8):1906-13.
4. Agustina AV. Hubungan Antara Obesitas Dan Kejadian Hernia Inguinalis. Universitas Negeri Semarang. 2014.
5. Onuigbo, WIB, Njeze GE. Inguinal Hernia. J Surg Operat Car. 2015;1(2):1-9.
6. Townsend, Courtney M. Hernias. Sabiston Textbook of Surgery. 17th Edition. Philadelphia. Elsevier Saunders. 2004;1199-1217.
7. Chooi Y, Ding C, Magkos F. The epidemiology of obesity. Metabolism. 2019;92:6-10.
8. Rosemar A, Angerås U, Rosengren A. Body mass index and groin hernia: a 34-year follow-up study in Swedish men. Ann Surg. 2008;247:1064-8.
9. Abramson JH, Gofin J, Hopp C, Makler A, Epstein LM. The epidemiology of inguinal hernia. A survey in western Jerusalem. J Epidemiol Comm Heal. 1978;32:59-67.
10. Mueck KM, Holihan JL, Mo J, Flores-Gonzales JR, Ko TC, Kao LS, et al. Computed tomography findings associated with the risk for emergency ventral hernia repair. Am J Surg. 2017;214(1):42-6.
11. Itatsu K, Yokoyama Y, Sugawara G, Kubota H, Tojima Y, Kurumiya Y, et al. Incidence of and risk factors for incisional hernia after abdominal surgery. Briti J Surg. 2014 ;101(11):1439-47.
12. Lau B, Kim H, Haigh PI, Tejirian T. Obesity increases the odds of acquiring and incarcerating noninguinal abdominal wall hernias. Am Surg. 2012;78(10):1118-21.
13. Marsman HA, Heisterkamp J, Halm JA, Tilanus HW, Metselaar HJ, Kazemier G. Management in patients with liver cirrhosis and an umbilical hernia. Surgery. 2007;142(3):372-5.
14. Sarkhosh K. A Systematic Review of the Association Between Obesity and Inguinal Hernias. In SAGES 2012. Annual Meeting. 2012.

Cite this article as: Bharata BS, Triarta GB. The relationship between obesity and obstruction risk of lateral inguinal hernia at Negara general hospital in 2019-2020. Int J Res Med Sci 2020;8:4247-50.