

Original Article

IS OBESITY ASSOCIATED WITH INCREASED POST-OPERATIVE WOUND SITE INFECTION?

Usman Ali Rahman, Nazia Karamat, Sami Ullah Bhatti, Adil Ifthikar, Maliha Adil and Abdul Wadood

Objective: To find out infection frequency in obese and non-obese patients in abdominal surgeries.

Methods: This descriptive case series evaluated the wound infection in obese versus non-obese patients in abdominal surgeries of Gulab Devi Chest Hospital Lahore and general hospital Lahore in six months from October 2016 to February 2017. Questionnaire was made and filled with the help of patients. Inclusion criteria were all indoor patient of post-operative abdominal surgeries, 15 to 87 years age and both gender. Calculated sample size was 128 patients. Data was collected and SPSS was used for analysis. Patients were divided in two groups. Size of each group was 64. Infection rate was determined in each group.

Results: 128 patients were included in this prospective descriptive study. Of the 128 patients, 50 (39.06%) were males and 78 (60.94%) were females. Mean age of patients was 37.95 ± 13.916 years. Overall infection rate was 39.84% (51 patients). There were 28 (21.88%) infected cases in obese group while 23 (17.97%) patients were infected among non-obese patients.

Conclusions: Obesity alone is considered to be a risk factor for wound infection, more surgical blood loss and a longer operation time. A tendency to regard obesity as a major risk factor in general surgery is not justified. Risk of infection is slightly higher in obese patients but not significant.

Keywords: wound infection, abdominal surgeries, obesity.

Introduction

Infections of surgical wounds can have serious consequences, both for the patient and for the care facility: surgical site infection (SSI) increases the length of postoperative stay, patient mortality, and the need for re-operation.¹ The most recent estimate suggests that 15.7% of hospital-acquired infections are SSIs, making SSI the third most prevalent form of healthcare-associated infection.² Obesity is defined as excessive accumulation of fat in the body and is the most common nutritional disorder in humans. It is a major cause of mortality and morbidity for associated metabolic disorders and cardiovascular disease.³ According to WHO definition, a person is considered overweight if her/his BMI is >25 , and obese if $\text{BMI} \geq 30 \text{ kg} \cdot \text{m}^{-2}$. Emerging data indicate an association between obesity and infectious disease.⁴

Prospective and retrospective cohort studies have indicated that obesity is associated with a significantly increased risk of skin and soft tissue infection after surgery,⁵ while operations on patients who are obese can be more complex and prolonged.⁶ It is stated that obesity decreases preoperative tissue oxygenation.⁷ Overall from the studies it is known that the risk of SSI increased

with increase of BMI. As tissue oxygen tension is a major predictor for postoperative wound infections reduced oxygenation might contribute to the observed higher risk of wound infection rate in obese patients.⁸ Laparoscopic abdominal surgery is relatively safe, even in morbidly obese patients.^{9,10} It is therefore unsurprising that fewer normal-weight laparoscopic patients have infectious complications.¹¹ However, laparoscopic procedures are considerably more complicated in obese patients.

The aim of our study was to evaluate the post-operative infection in local obese patients and compare it with non-obese patients.

Methods

This descriptive case series evaluated the wound infection in obese versus non-obese patients in abdominal surgeries of Gulab Devi Chest Hospital Lahore and General hospital Lahore in six months from October 2016 and February 2017. Questionnaire was made and filled with the help of patients. Inclusion criteria were all indoor patient of post-operative abdominal surgeries, 15 to 80 years age and both gender undergoing clean or clean contaminated surgeries. BMI more than 30 was considered obese while less than 30 non-obese.

were excluded from the study. Calculated sample size was 128 patients. Data was collected and analysed using SPSS version 16. All patients were given single dose of antibiotic at time of induction of anaesthesia.

Results

128 patients divided into two groups of 64, Group A and Group B. In Group A were obese patients and in Group B were non obese patients. In group A male were 19 (29.68%) and female were 45(70.31%). In group B male were 31 (48.43%) and female were 33(51.56%). Patients aged 50 or more in group A were 17 (26.56%) while patients with age less than 50y were 47 (73.44%) . Mean age of group A was 41.75. In group B 14 (21.87%) patients were aged 50 or more while patients younger than 50 years were 50 (78.125%). Mean age of group B was 34.07. Mean BMI of group A was 32.0375 and mean BMI of group B was 21.75. In group A 28 (43.76%) patients was infected of which 11 (39.28%) were male and 17(60.71%) were female. In group B 23(35.93%) patients were infected of which 15 (65.21%) were male and 8(34.78%) were female. In this study 128 patients, 50 male (39.06%) and 78 (60.94%) females. Mean age of patients was 37.95± 13.916 years. In this study height of patients mean height of patients is 163.78cm and S.D ±3.872. Mean Weight 72.04 S.D± 16.957 kg. Mean BMI of patients was 26.89 Kg/m2 S.D± 6.18424. 64 patients out of 128 patients were obese and 64 patients were non obese. 51(39.84 %) infected patients and effected were 77 (60.16%) patients. 28 (21.88%), infected obese patients 23 (17.97%) infected non-obese patients were present. In obese patients infection was present in 28(21.88%) patients. In non obese patients infection was present in 23(17.97%) patients. Value of P = 0.367. There is no significant difference between infection in obese and non obese patients in abdominal surgeries.

Discussion

According to the World Health Organization, obesity has doubled since 1980, with a prevalence that is continuing to rise. In the United States, more than one-third of the adult population is currently

obese. ⁽¹²⁾As in Europe, obesity has also reached epidemic proportions, although with considerable geographic variation. ¹³ Obesity reduces quality of life and life expectancy itself. ¹⁴

In this study we compared post operation infection in obese and non-obese patients. A total of 128 patients were included of which 64 patients were obese and 64 patients were non obese. Obesity is a pervasive health issue in today's society. It induces complex negative effects on multiple organ system functions and processes, including issues related to wound healing. Efforts to decipher the origins, physiology, and health consequences of obesity on the human body are an imperative focus in current investigations. Numerous studies have shown the correlation between obesity and infection. ¹⁵The probability of wound infection is determined largely by the interaction of the microbial burden, local wound conditions, and the patient's systemic host defenses. The conditions of antimicrobial therapy, both prophylactically and therapeutically, can only be defined when these other factors are under control. ¹⁶

In this study we had observed 128 patients and infection was observed in 51 patients. Nosocomial infections pose significant risks for all hospitalized patients and can cause minor discomfort and/or life-threatening events. Prospective and retrospective cohort studies have indicated that obesity is a s s o c i a t e d

Table-1: Comparison of wound infection in obese non obese patients.

Count	Infections		S Total	
	Yes	No		
Obese	Yes	28	36	64
Female	No	23	41	64
Total	46	51	77	128

Table-1: Comparison of wound infection in obese non obese patients:

	Infections	Non infection	p-value
Obese	28 (43.75%)	36 (56.25%)	.367
Non-obese	23 (35.93%)	41 (64.04%)	

Table-1: Obese * Infection Cross tabulation. Comparison of wound infection in obese non obese patients.

Type of patients	Male	Female	Age of pt 50y or above 50 y	Age of pt 50y or less 50 y	Infected patients	Infected Male	Infected Female	Mean BMI
Obese	19 (29.68%)	45 (26.56%)	17 (26.56%)	47 (73.43%)	28 (43.755%)	11 (39.28%)	17 (60.710%)	32.0375
Non-obese	31 (48.43%)	33 (51.56%)	14 (21.87%)	50 78.1255%)	23 (35.93%)	15 (65.21%)	08 (34.78%)	21.75

Chi-square value = .815 P-value is = .367

with a significantly increased risk of skin and soft tissue infection after surgery.¹⁷⁻¹⁹

In our study, in group of obese patients infection was observed in 28 patients (21.88%) and infection was not present in 36 patients (28.12%). In non obese patients infection were observed in 23 (17.97%) but non infective patients were 41 (32.03%). Value of $P=0.367$. Therefore although there were more infected cases in obesity group, however, this difference is not clinically significant. The main limitation of our study is the small sample size. A larger study can be done to further

confirm our findings.

Conclusion

Obesity is considered a significant risk factor for wound infection, more surgical blood loss and a longer operation time. On the basis of our results we found no significant difference in infection rate among obese and non-obese patients.

*Department of General Surgery
Gulab Devi Hospital, Lahore
www.esculapio.pk*

References

1. COELLO, R., CHARLETT, A., WILSON, J., WARD, V., PEARSON, A. & BORRIELLO, P. 2005. Adverse impact of surgical site infections in English hospitals. *Journal of Hospital Infection*, 60, 93-103.
2. FINUCANE, M. M., STEVENS, G. A., COWAN, M. J., DANAEI, G., LIN, J. K., PACIOREK, C. J., SINGH, G. M., GUTIERREZ, H. R., LU, Y. & BAHALIM, A. N. 2011. National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9·1 million participants. *The Lancet*, 377, 557-567.
3. HOURIGAN, J. S. 2011. Impact of obesity on surgical site infection in colon and rectal surgery. *Clinics in colon and rectal surgery*, 24, 283-290.
4. CASTAÑEDA CASTILLO, P. A. 2016. Evolución de los pacientes sometidos a cirugía de revascularización de miocardio con doble arteria mamaria interna en el Instituto Nacional Cardiovascular en el periodo 2012-2015.
5. HUTTUNEN, R. & SYRJÄNEN, J. 2013. Obesity and the risk and outcome of infection. *International journal of obesity*, 37, 333-340.
6. WOMEN'S, N. C. C. F. & HEALTH, C. S. 2008. *Surgical Site Infection*.
7. KUMAR, P. 2009. *Kumar and Clark's Clinical Medicine. Španjolska, Saunders Elsevier*.
8. -CHOBAN, P. S., HECKLER, R., BURGE, J. C. & FLANCAUM, L. 1995. Increased incidence of nosocomial infections in obese surgical patients. *The American Surgeon*, 61, 1001-1005.
9. SCHAUER, P. R., IKRAMUDDIN, S., GOURASH, W., RAMANATHAN, R. & LUKETICH, J. 2000. Outcomes after laparoscopic Roux-en-Y gastric bypass for morbid obesity. *Annals of surgery*, 232, 515-529.
10. BROLIN, R. E. 2004. Laparoscopic versus open gastric bypass to treat morbid obesity. *Annals of surgery*, 239, 438-440.
11. BRAGA, M., VIGNALI, A., GIANOTTI, L., ZULIANI, W., RADAELLI, G., GRUARIN, P., DELLABONA, P. & DI CARLO, V. 2002. Laparoscopic versus open colorectal surgery: a randomized trial on short-term outcome. *Annals of surgery*, 236, 759-767.
12. ORGANIZATION, W. H. 2000. *Obesity: preventing and managing the global epidemic*, World Health Organization.
13. Braga, M., et al. (2002). "Laparoscopic versus open colorectal surgery: a randomized trial on short-term outcome." *Annals of surgery* 236(6): 759-767.
14. LIVINGSTON, E. H. & KO, C. Y. 2002. Use of the health and activities limitation index as a measure of quality of life in obesity. *Obesity Research*, 10, 82.
15. YVONNE N. PIERPONT, TRISH PHUONG DINH, R. EMERICK SALAS, ERIKA L. JOHNSON, TERRY G. WRIGHT, MARTIN C. ROBSON AND WYATT G. PAYNE 2014. *Obesity and Surgical Wound Healing*. Hindawi Publishing Corporation. Vol 2014.
16. HOWARD, R. & LEE JR, J. 1995. *Surgical wound infections: epidemiology, surveillance, and clinical management*. *Surgical Infectious Diseases*, 401-412.