ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 09 | September - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A CORRELATION BETWEEN OBESITY AND SEROMA FOLLOWING MODIFIED RADICAL MASTECTOMY IN 78 CASES PERFOMED IN OUR CENRE

Breast Surgery

Dr Royal G. Parmar Senior Resident Mpsmc Surgery Department Jamnagar

KEYWORDS

INTRODUCTION

India is a developing country which is in a transitional state of under nutrition due to poverty and obesity due to the industrialization and rapid urbanization. In India, more than 135 million individuals were affected by obesity. Previously, different studies were reported which after using different methodologies and cut off points for defining obesity that created complications in comparison. Presently there is no collective data of prevalence of obesity in India. So, that the present study represents the prevalence of general obesity in India on the basis of studies reported during last 20 years. For those who still meet the criteria for operability, surgery is still the preferred method of treating breast cancer. One treatment option is the modified radical mastectomy (MRM[1,9] and a significant problem is subsequently discovered with total seroma after mastectomy.

As part of the body's normal healing process, capillary permeability increases and fluid changes cause a buildup of serous fluid in the interstitial space, which leads to the development of seroma[10–12].

Following a mastectomy, postoperative seroma is a condition that is frequently observed.[13]

The incidence varies between 10 and 85%, and it is usually gone within a few days or weeks. [13,14]

However, it was shown that there was an increase in the incidence of seroma among obese people. The only explanation for this is that changes to the lymphatic system accompany fluid buildup.[9–11,15–17]

The next step is to insert a drain after surgery, which aims to limit the harmful effects of fluid collection and seroma generation.[13,18,19]

Obesity is one element in the seroma generation that has been linked to, along with the use of the drain itself.[18]

However, the exudation caused by the inflammatory process by the drain tube as a foreign body.

As a result, prolonged drain use increased seroma formation. As a result, the patient's discomfort, pain, length of stay, and cost will all rise.[13,18]

Since the drain tube needs to be withdrawn before the patient is discharged, the insertion of a drain after MRM lengthens the hospital stay.[18]

It is believed that obesity with a higher body mass index (BMI) is associated to the creation of drains. Therefore, having a high BMI was mentioned as a risk factor for developing a seroma after a mastectomy.[9,16,20]

Conducted research reveals dispute. [21] Therefore, we conducted a study to discover whether there was a correlation between these traits in our patients.

METHODS

We do research at the M. P. Shah Medical College, Jamnagar, Department of Surgery.

Women who are diagnosed with unilateral breast cancer after MRM are the target population, and women who are treated with MRM and drain installation in OUR CENTRE under the direction of Dr. ROYAL PARMAR between 2018 and 2019. Patients with diabetes, hypertension, and bilateral breast cancer were excluded. When calculating BMI, body weight and height are recorded as independent variables, whereas drain production and length of stay are recorded as dependent variables. SPSS version 20.0 is used to process the data. We described the subject's characteristics in detail.

We performed the distribution test first, using the Kolmogorov-Smirnov normality test with $n > 50$ and $p = 0.05$.

If the p value is greater than 0.05, the distribution is considered to be normal, and there are 4 data points with mean and standard deviation (2 SD).

If the distribution has a p value less than 0.05, the data are shown as median and range.

If a variable is normally distributed and the linearity requirement is satisfied, the Pearson correlation test is performed on the correlation between BMI value (numerical) and total seroma (numerical), as well as between total seroma (numerical) and length of stay (numerical).

If anomalous variable distribution is discovered, transformation is initiated. The appropriate theoretical test will rely on the value of transformation.

If the transformation technique is followed and the linearity requirements are satisfied, the variable is distributed normally, and the Pearson correlation test is then conducted.

In contrast, the Spearman test should be employed if the variables have an anomalous distribution.

Furthermore, the correlation test should not be conducted before the linearity conditions are satisfied. In this situation, a comparison test should be conducted first using a classification of the variables.

RESULTS:

67 participants were enrolled out of 78 patients with breast cancer.

8 participants were excluded: 3 had concomitant conditions, including diabetes mellitus and hypertension, two had bilateral issues, and four had insufficient data. Additionally, three previously included patients were not included in the statistical analysis since one of them was determined to be an outlier during evaluation of the distribution test. There were two (3%) participants who were underweight, fifteen (22.4%) normal, thirteen (19.4%) who were overweight but at risk, twenty-six (30.8%) who were classified as obese I, and eleven (16.4%) as obese II. Table 1 displays the features of the subject. Total seroma production and the correlation test for BMI both revealed a normal distribution ($p = 0.2$), however we discovered that the distribution of length of stay revealed an aberrant one (p).

We employed the Pearson method to evaluate the correlation test between obesity and total seroma because both of the numerical variables had a normal distribution. Table 1 illustrates the linear relationship between BMI and total seroma. In this investigation, the coefficient determinant (R2) was 0.338, which indicates a moderate connection. Additionally, we discovered aA significant ($p = 0.000$) Pearson correlation of 0.581 between BMI and total seroma. While evaluating the relationship between length of stay and total seroma, we discovered that the coefficient determinant (R2) in this study was 0.542, indicating a significant relationship. With a Pearson correlation of 0.736, the association was determined to be significant ($p = 0.000$).

Table 1. Subjects characteristic

Variable	Mean (±SD)	Median	Min-Max
Age (years)	48.5 (±8.5)	49	33-69
Body weight (kg)	61.5 (±10.5)	60	40-90
Height (m)	1.55 (±0.06)	1.55	1.43-1.77
BMI (kg/m^2)	25.43 (±4.08)	25.39	16.65-35.59
Length of stay (days)	4.6 (±1.5)	4	3-8
Total seroma (mL)	502.3(±207,8)	504	134-990
Daily seroma (mL)	109..6 (±32.1)	106.7	44.7-170.8

BMI body mass index.

DISCUSSION:

As we removed 8 of the total 78 subjects and3 people who were outliers to the distribution, we enrolled 67 subjects who met the inclusion criteria.

These 67 people were discovered in excess of the projected minimum sample size [58]. Subjects that were disregarded were those whose confusing influences on seroma production were known to exist.

We opted not to enroll even though it has been demonstrated and suggested in some publications that these entities have no relationship to seroma production[9,11,40]).

Additionally, we made the decision not to get sidetracked while researching diabetes and hypertension as risk factors.

In the study, we discovered that the average age of the subjects was similar to that which Maria and colleagues reported (42.56 years 8.77 ranged between 30-57 years).

42 and were distinct from those found by Banerjee and colleagues (median age of subjects was 62.38 years; range of subjects' ages was 36-90 years).[15]

This variation may be related to various population-related topics.

In contrast to underdeveloped nations like Indonesia, Banerjee and colleagues conducted their research on the subjects in a highly developed nation with a high life expectancy.

However, reported data indicates that breast cancer incidence varies by centre.

The average BMI of the study's participants was somewhat less than that of Banerjee and colleagues (26.83 kg/m2 4.71) and Maria and colleagues (24.7 kg/m2 4.2). [15,49]

With a BMI of 25 to 29.9 kg/m2, the patients in our study were mostly classified as obese I (38.8%), overweight at risk (19.4%), and obese II (16.4%). According to these findings, breast cancer is more likely to strike obese people. The median length of hospital stays (4 days, with a range of 3 to 8 days) was different from what Banerjee and colleagues reported (median 8.3 days, with a range of 3 to 17 days). [15] In this investigation, we discovered that after the drain was removed, patients were released. Total drain production during the course of the in-ward period was used to evaluate the seroma development characteristic. Our findings (median total seroma 1146 mL, ranging from 130-3190 mL, median daily seroma 159 mL) were marginally less than those reported by Banerjee and colleagues.[15] This explains why the length of stay was shorter in this study than it had been in Banerjee and colleagues' study. Surgeons should pay close attention to obesity as a risk factor for breast cancer. Additionally, obesity has a negative impact on the healing process and the possibility of complications after a mastectomy, as described by Forouhi and colleagues. He reported 75 breast cancer patients who underwent mastectomy surgery and discovered a strong link between obesity and post-mastectomy complications ($p = 0.015$). [15]

With a p value of 0.05, Banerjee and colleagues showed that total drainage volume is considerably larger in obese people than in non-obese people (note that they utilised the BMI criterion of >30 kg/m2). [15] In another study conducted by Werner and colleagues, 282 breast cancer stage I and stage II patients who underwent mastectomy were reported to have radiated. His research revealed that BMI is a factor that is closely associated to edoema. It has been hypothesised that people with high BMIs develop seroma more frequently than people with low BMIs because there is a positive linear link between BMI and seroma generation. [9,15,41]

In the study, we discovered a moderately positive correlation (coefficient correlation of 0.581), a linear correlation statistically significant (p 0.01), and a coefficient determinant (R2) of 0.338 between BMI and total seroma, indicating that BMI contributed as much as 33.8% to the formation of total seroma during hospitalization. Similar to what Banerjee found, it was discovered that BMI and volume of drainage in breast cancer patients who received MRM with or without axillary dissection or extensive excision correlated positively and moderately linearly.[15] Seroma development is affected by a variety of variables, it is true.

BMI, surgical methods, the degree of axillary dissection, the use of a drain, and negative pressure on the drain are all included in this. [18,37,39,40] Seroma formation will thus raise morbidity, lengthen hospital stays, and raise costs. [19]

We did not focus on any other risk factor previously indicated in this investigation; instead, we were interested in determining the relationship between obesity and total seroma formation and length of stay. And what we discovered was a link between obesity and seroma development. Therefore, while treating breast cancer in an obese patient, the surgeon should be worried about the potential for axillary dissection extension and increased postoperative seroma formation. The installation of a drain tube after a mastectomy is addressed to drain any collected serous fluid that may be affecting the healing of the anterior chest covering flap.

The perfusion is compromised by a distended flap, which leads to infection and flap necrosis.

On the other hand, it should be understood that the drain itself is an alien substance that encourages seroma growth. More seroma development was induced by a longer drain installation. [16,19,20]

Based on the knowledge that the drain contributed to the length of the hospital stay, the decision to install one should be made. We did believe it because we discovered that after the drain was removed, all individuals were released.[19]

We discovered a significant positive correlation between total seroma and duration of stay (coefficient correlation of 0.736; coefficient determinant (R2) of 0.542), indicating that total seroma contributed to length of stay by as much as 54.2%.

The healing process is carried out as overall seroma creation declines and seroma production sharply declines. [45]

Drain removal is typically initiated when seroma production reaches 35 to 50 mL every 24 hours. [16,17,46]

A predisposing factor and contributor to seroma production is obesity, as measured by BMI.

In addition, it increased the time that patients who underwent mastectomy for breast cancer stayed in the hospital. Repeated paracentesis and aspiration are necessary to extract seroma from accumulated serous fluid. Since it harmed a compromised flap, was uncomfortable, susceptible to infection, and caused morbidity, it was somehow unfavourable. In contrast, the placement of a drain results in pain, discomfort in the subjects, restrictions on their activities, especially postoperative shoulder exercises, and a delay in the delivery of adjuvant therapy. These will allow for an extended hospital stay. [9,18,20,39]

We come to the conclusion that seroma formation has a strong positive correlation with duration of stay in breast cancer with obesity and that seroma formation has a somewhat positive link to total seroma. Therefore, it is important to warn obese breast cancer patients about the potential for seroma formation, the usage of drains, and extended hospital stays.

For surgeons, awareness of these seroma-related issues, appropriate surgical technique (careful dissection, delicate hemostasis, anchor sutures), and the application of compressive external bandage to reduce dead space and seroma generation are indicators of a successful course of treatment.

REFERENCES:

1. Arnold M, Pandeya N, Byrnes G, Renehan AG, Stevens GA, Ezzati M,et al. Global burden of cancer attributable to high body mass index in 2012: a population based study. Lancet Oncol 2015;16:36–46.
2. Zieliński J, Jaworski R, Irga N, Kruszewski JW, Jaskiewicz J. Analysis of selected factors influencing seroma formation in breast cancer patients undergoing mastectomy. Arch Med Sci 2013;9(1):86–92.
3. Badan Penelitian and Pengembangan Kesehatan Kementerian Kesehatan RI. Riset Kesehatan Dasar. Jakarta: Badan Penelitian and Pengembangan Kesehatan Kementerian Kesehatan RI; 2013. p.209–23.
4. Assi HA, Khoury KE, Dbouk H, Khalil LE, Mouhieddine TH, El Saghir NS. Epidemiology and prognosis of breast cancer in young women. J Thorac Dis 2013; suppl1:2–8.
5. Kementerian Kesehatan RI. Pedoman teknis pengendalian kanker payudara and kanker leher rahim. Jakarta: Kementerian Kesehatan RI; 2010. p.4–7.
6. Haakinson DJ, Leeds SG, Dueck AC, Gray RJ, Wasif N, Stucky CC, etal. The impact of obesity on breast cancer: a retrospective review. Ann Surg Oncol 2012;19:3012–18.
7. Pierpont YN, Dinh TP, Salas RE, Johnson EL, Wright TG, Robson MC, et al. Obesity and surgical wound healing: a current review. ISRN Obes 2014;1–13.
8. Sood A, Abdollah F, Sammon JD, Majumder K, Schmid M, Peabody JO, et al. The effect of body mass index on perioperative outcomes after major surgery: results from the national surgical quality improvement program (acs–nsqip) 2005–2011. World J Surg 2015; 39(10):2376–85.
9. Raghavendra K. To study the factors influencing seroma formation after modified radical mastectomy. Bangalore: Rajiv Gandhi University; 2011. p.1–83.
10. Luttrell T. Effect of obesity on chronic wound healing. Missouri (USA): UMI Dissertation Publishing; 2012. p.1–57
11. Guo S, DiPietro LA. Factors affecting wound healing. J Dent Res 2010;89(3):219–29.
12. Baxter H. Management of surgical wounds. Nurs Times 2003;99(13):66–8.
13. McCaul JA, Aslaam A, Spooner RJ, Louden I, Cavanagh T, Purushotham AD. Aetiology of seroma formation in patients undergoing surgery for breast cancer. The Breast 2000;9:144–8.
14. Stanczyk M, Grala B, Zwierowicz T, Maruszynski. Case report: Surgical resection for persistent seroma, following modified radical mastectomy. World J Surg Oncol 2007;5–104.
15. Banerjee D, Williams EV, Ilott J, Monypenny JJ, Webster DJT. Obesity predisposes to increased drainage following axillary node clearance: a prospective audit. Ann R Coll Surg Eng 2001;83:268–71.
16. Weitman ES, Aschen SE, Eisner GF, Albano N, Cuzzone DA, Ghanta S, et al. Obesity impairs lymphatic fluid transport and dendritic cell migration to lymph nodes. PLoS ONE 2013;8(8):1–15
17. Mehrara BJ, Greene Ak. Lymphedema and obesity: is there a link? PlastReconstr Surg 2014;134(1):154–60.
18. Chintamani, Singhal V, Singh JP, Bansal A, Saxena S. Half versus full vacuum drain suction age after modified radical mastectomy for breast cancer a prospective randomized clinical trial. BMC Cancer2005;5(11):1–5.
19. Durai R, Mownah A, Philip CH. Use of drain in surgery: a review. J Perioper Pract 2009;19(6):180–6.
20. Azamris. Perbandingan efektivitas lama pemakaian drain pasif untuk mencegah seroma pasca modified radical mastectomy. Cermin Dunia Kedokteran 2015;42(2):92–5 (article in Bahasa Indonesia).
21. Kuroi K, Shimozuma K, Taguchi T, Imai H, Yamashiro H, Ohsumi S, Saito S. Evidence based risk factors for seroma formation in breast surgery. Jpn J Clin Oncol 2006;36:197–206.
22. Sandjaja S. Prevalensi gizi lebih and obesitas penduduk dewasa di Indonesia. Gizi Indonesia 2005;31:1–7 (article in Bahasa Indonesia). 23. Zimmet SP, Caterson I, Chunning C, Ikeda Y, Khalid Ak. The AsiaPacific perspective: redefining obesity and its treatment. Australia:Health Communication publishing; 2000.p.19–21.
24. Surgical guidelines for the management of breast cancer, association of breast surgery at BASO. Eur J Surg Oncol 2009:suppl.1–22.
25. Manuaba IBTW, editor. Perhimpunan dokter spesialis bedah onkologi: Panduan penatalaksanaan kanker solid. Jakarta: Sagungseto; 2010. (Text in Bahasa Indonesia)
26. Ogundiran TO, Ayandipo OO, Ademola AF, Adebamowo CA.Mastectomy for management of breast cancer in Ibaand, Nigeria. BMC Surg 2013;13(59):1–9.
27. Jatoi I, KaufmannM, Petit JY.Atlas of breast surgery. German: Springer; 2006.
28. Kass RB, Lind DS, Souba WW. Breast procedure. In: Souba WW, Fink MP, Jurkovic J, editors. ACS surgery principles and practice. 6th ed. New York: WebMD Inc; 2007.
29. Waassung K. The role of inflammation in the healing process. [2012] [cited 2015 Jan 25]. Available from: http://cichirowc.com/uploads/20120130
30. Kumar V, Abbas AK, Fausto N, Robbins SL, Cotran RS. Tissuerenewal and repair: Regeneration, healing, and fibrosis. In: Robbins andCochtran Pathologic basis of disease. Ed.7th Philadelphia: Elsevier Saunders; 2005.
31. Wilson JA, Clack JJ. Obesity: Impediment to postsurgical wound healing. Adv Skin Wound Care 2004;17(8);426–35.
32. Hess CH. Checklist for factors affecting wound healing. Adv Skin Wound Care 2011;24(4):192–5.
33. Greenberg AS, Obin MS. Obesity and the role of adipose tissue in inflammation and metabolism. Am J Clin Nutr 2006;83suppl:461–5.
34. Vachharajani V, Neil D. Adipose tissue: a motor for the inflammationassociated with obesity. IUBMB Life 2009;61(4):424–30.
35. Davis LV, Rose DP. The obesity inflammation eicosanoid axis in breast cancer. J Mammary Gland Biol 2013;18:291–307.
36. Alawad AA. Factors predicting seroma formation following breastcancer surgery: a concise review. Int Res Med Sci 2014;2(6):85–91.
37. Kuroi K, Shimozuma K, Taguch T, Imai H, Yamashiro H, Ohsumi S, Saito S. Pathophysiology of seroma in breast cancer. Breast Cancer 2005;12(4):288–93.
38. Vitug AF, Newman LA. Complications in breast surgery. Surg Clin North Am 2007;87:431–51.
39. Dahri FJ, Awan MS, Qazi AR, Khaskheli NM, Soomro IA. Early wound complications following modified radical mastectomy with axillary clearance. J Surg Pak 2011;16(4):165–9.
40. Srivastava V, Basu S, Shukla VK. Seroma formation after breast cancer surgery: what we have learned in the last two decades. J Breast Cancer 2012;15(4):373–80.
41. Prabhu N. Factors that affect total inpatient drainage output after TRAM FLap surgery. J Young Investig 2002;6(1):1–5.
42. Maria K, Kurnia A. Evaluasi pembentukan seroma pasca mastektomi: yang dilakukan pencabutan drain dalam 2 hari pertama. Jakarta: Universitas Indonesia; 2012.p.1–26. (Text in Bahasa Indonesia).
43. Abulnagah G, Fayoumi T, Lotfy H, Shehab W, Tarek A. Comparative study between using harmonic scalpel and electrocautery in modified radical mastectomy. Egypt J Surg 2007;26(4):176–80.
44. Hashemi E, Kaviani A, Najafi M, Ebrahimi M, Hooshmand H, Montazeri A. Seroma formation after surgery for breast cancer. World J Surg Oncol 2004;2:44–9. 45. Sakkary MA. The value of mastectomy flap fixation in reducing fluid drainage and seroma formation in breast cancer patients. World J Surg Oncol 2012;10(8):1–6.
46. Hokkam E, Farrag S, Khammash S. Tetracycline sclerotherapy in treating postmastectomy seroma: a simple solution for a frequently occurring problem. Egypt J Surg 2009;28(3):99–104.
47. Cleg–Lamptey JNA, Dakubo JCB, Hodasi WM. Comparison of four day and ten day post mastectomy passive drainage in Accra, Ghana. East Afric Med J 2007;84(12): 561–5.
48. Murray JD, Elwood ET, Jones GE, Barrick R, Feng J. Decreasing expander breast infection: a new drain care protocol. Can J Plast Surg 2009;17(1):17–21.
49. Barwell J, Campbell L, Watkins RM, Teasdale C. How long should drain suction s stay in after breast surgery with axillary dissection? Ann R Coll Surg Engl. 1997;79:435–7.