

RELATION BETWEEN OBESITY STATUS AND MENOPAUSAL STATUS IN CANCER PATIENT AT SANGLAH PUBLIC HOSPITAL DURING JULY 2016- DECEMBER 2016

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Abstract: According to WHO, cancer is one of the most causes of death worldwide, to be precise, it is the second most prevalence disease after cardiovascular diseases. One of the most common type of cancer with the highest prevalence currently is breast cancer. Obesity is believed as one of the risk factors of breast cancer; however this is only valid when the woman is on her post-menopausal period. This study aim to know the correlation between obesity and menopause status among breast cancer patients. This study was using cross-sectional study design and data were obtained using systematic random sampling through an interview and anthropometrics observation in the oncologic policlinic and wards Sanglah Central Hospital within the period of July 2016 until December 2016. Obesity was measured using BMI, waist circumferences and arm circumferences. This study found that there was a significant correlation between obesity and breast cancer using all of the anthropometrics measurements (p value 0.013; 0.03; and 0.024 respectively). It can be concluded that obesity is one of the risk factors of breast cancer among post-menopausal woman. It is suggested that further study compare a similar study within the rural and urban population.

Keywords: Obesity, menopause, breast cancer.

I. INTRODUCTION

Cancer is one of the highest causes of death globally, especially breast cancer. In epidemiology, it is known that in 1990, as many as 59% of breast cancer cases came from developed countries such as America, Europe, Japan and Australia but since 2008, the number of diagnoses of breast cancer began to balance between developed and developing countries with a tendency to be more from developing country. In 2012 it was estimated that 53% of female breast cancer cases (1.7 million cases) occurred in developing countries with an estimated rate of 43 people per 100,000 population.¹ In Asia, breast cancer is the most commonly diagnosed cancer in women and is the cause of death number 2 after lung cancer. In 2012 there were 639,824 cases of breast cancer in Asian countries with 187,213 cases originating from China, followed by 144,397 cases from India, 55,710 cases from Japan, 49,998 cases from Indonesia and 34,038 cases originating from Pakistan.² As a developing country, Indonesia prevalence of new cases in 2013 was 48.3% with a 12.9% mortality rate with an estimated absolute number of cases in the province of Bali totaling 8,279 cases.³

The increased prevalence of breast cancer cases causes the importance of knowing the risk factors for breast cancer. Some risk factors that are thought to cause breast cancer are never getting pregnant, getting pregnant in old age, using birth control pills, using hormone replacement therapy after menopause, never giving breast milk, alcohol consumption, obesity, lack of exercise and abortion. It is also known that obesity in the postmenopausal population can increase the risk of breast cancer by 1.59 times (p <0.001) compared to non-obesity.⁴ Based on findings from various previous studies, the

authors are interested in finding out the relationship between obesity and postmenopausal status in patients breast cancer in Sanglah Hospital, Denpasar, Bali in the period July to December 2016.

II. METHODOLOGY

This study is an analytic study with a cross-sectional approach where no follow-up is taken to the sample. Samples were taken using a random sampling method taken from breast cancer patients registered at the clinic and oncology in Sanglah Hospital, Denpasar in the period July 2016 to December 2016. Patients with disorders and metabolic diseases such as hyperthyroidism and diabetes mellitus; patients taking drugs with side effects of weight gain and patients with metastatic cancer were excluded from this study.

The independent variables examined in this study were obesity status measured by 3 basic anthropometric measurements namely Body Mass Index (BMI), abdominal circumference and Upper Arm Circumference (MUAC). Based on BMI, obesity is defined as a BMI value > 25kg / m², whereas based on abdominal circumference, abdominal circumference > 80 cm is classified into the obese group. Based on MUAC, patients with MUAC > 34.2 cm were classified as obese. While the dependent variable in this study is menopause status, where patients who are defined as pre-menopause are <45 years old and post menopause are patients > 45 years old.

Data were analyzed using SPSS statistical software. Bivariate analysis was performed using the chi-square test, where the hypothesis was accepted if the significance value (p) was less than 0.05.

III. RESULT AND DISCUSSION

A total of 130 samples were collected in this study. Based on obesity status, patients are regrouped based on the type of measurement taken to establish obesity status. Based on BMI measurements, it was found that 41.5% of the sample had obese status, whereas if measured based on abdominal circumference there were 66.2% patients with obesity status and 26.9% obese based on MUAC measurements (table 1). While based on menopausal status, 47.7% of patients were found in the pre-menopausal period and 52.3% were in the post-menopausal status (table 2).

Table 1: Characteristics of Obesity Research Samples Based on Various Measurements

	BMI (%)	Abdominal Circumference (%)	MUAC (%)
Obese	54 (41,5)	86 (66,2)	35 (26,9)
Non Obese	76 (58,5)	44 (33,8)	95 (73,1)

Table 2: Characteristics of Menopause Status in Research Samples

	BMI (%)
Pre-Menopause	62 (47,7)
Pasca-Menopause	78 (52,3)

In this study an analysis was performed to see the effect of obesity status based on the type of measurement with the patient's menopause status. Table 3 shows the results of the analysis of the relationship between obesity status based on BMI with patient menopause status. It can be seen that 51.5% of post-menopausal patients are obese (OR = 5.79; p = 0.013). While in table 4 it can be seen that 77.9% of postmenopausal patients have obesity status based on measurements of abdominal circumference (OR = 8.84; p = 0.003) and in table 5 it is found that 35.3% of postmenopausal patients have obesity status based on measurements upper arm circumference (OR = 5.07; p = 0.024).

Table 3: Crosstabulation Results, Chi-Square Analysis, and Risk Estimate between Obesity and Menopause Status Based on BMI

BMI	Menopause Status		Total	OR	P
	Pasca Menopause (%)	Pre Menopause (%)			
Obese	35 (51,5)	19 (30,6)	54 (41,5)	5,79	0,013
Non Obese	33 (48,5)	43 (69,4)	76 (58,5)		
Total	68 (100)	62 (100)	130 (100)		

Table 4: Crosstabulation Results, Chi-Square Analysis, and Risk Estimate between Obesity and Menopause Status Based on Abdominal Circumference

Abdominal Circumference	Menopause Status		Total	OR	P
	Pasca Menopause (%)	Pre Menopause (%)			
Obese	53 (77,9)	33 (53,2)	86 (66,2)	8,84	0,003
Non Obese	15 (22,1)	29 (46,8)	44 (33,8)		
Total	68 (100)	62 (100)	130 (100)		

Table 5: Crosstabulation Results, Chi-Square Analysis, and Risk Estimate between Obesity and Menopause Status Based on MUAC

MUAC	Menopause Status		Total	OR	P
	Pasca Menopause (%)	Pre Menopause (%)			
Obese	24(35,3)	11 (17,7)	35 (17,7)	5,07	0,024
Non Obese	44 (64,7)	51 (82,3)	51 (82,3)		
Total	68 (100)	62 (100)	130 (100)		

In this study it was found that obesity has a significant correlation with postmenopausal status both by using measurements of BMI, abdominal circumference and upper arm circumference. Literatures have revealed that weight can affect the incidence of breast cancer, especially in populations that have experienced menopause. Adipocyte cells can secrete products called adipokines which include leptin, Tumor Necrosis Factor (TNF) α , Interleukin (IL) -6, and Hepatocyte Growth Factors (HGFs) that circulate in the plasma and have a positive correlation with BMI. One of the adipokines that has a direct role in breast cancer is leptin. Obese women tend to have high levels of leptin, which can induce stimulation of cancer growth through autocrine mechanisms. In addition, he is also involved in survival and proliferation of cancer cells through the Transducers and Activators of Transcription 3 (STAT3) pathway, Transcription Activator Protein 1 (AP-1), Extracellular Signal Regulated Kinase-2 (ERK2) and MAPK and also regulates estradiol levels which increases tumor development. However, leptin levels did not differ significantly in obese women who were in the pre-menopausal phase and normal women. Leptin levels significantly correlate with aromatase activity in postmenopausal women.⁵ The difference in the effects of obesity in pre and postmenopausal women is evidenced in a study conducted by Chen et.al, which found that a positive relationship between BMI and breast cancer risk in women post-menopause with an increased risk of 1.03 times along with an increase in BMI of 1kg / m² whereas in postmenopausal women a negative correlation was found.⁶ Another study conducted by Sebastiani et.al also showed similar results in which there was an increased risk of breast cancer in women postmenopausal obesity by 1.32 times (p = 0.04), larger tumor size and tendency for lymph node involvement.⁷ A study also found an increased risk of breast cancer 1.5 times (95%CI = 1.06-2.13) in obese postmenopausal women, while in pre menopausal women no significant correlation was found fish between obesity and the risk of breast cancer.⁸ Studies conducted by Neuhouser et.al actually show an increased risk of invasive breast cancer that tends to be more severe in obese women who have entered the post-menopausal phase (RR = 1.58; 95%CI = 1.40-1.79) while the risk for obese women in the pre-menopausal phase is much smaller (RR = 0.32; IK95% = 0.11-0.88) .⁹ A large study involving 3460 women showed an increased risk of breast cancer 2.21 times greater in postmenopausal women who were obese (95%CI = 1.23-3.67) whereas in pre-menopausal women the increased risk was estimated to only reach 1.18 times (95%CI = 1.01-1.88) .¹⁰ These findings indicate that in post-menopausal women, weight balance must be considered so that the risk of breast cancer in postmenopausal women can be reduced.

IV. CONCLUSION

In this study found a positive and significant relationship between obesity status and menopausal status in women with breast cancer. Significant relationships were found both in the measurement of obesity using BMI, abdominal circumference and MUAC. Menopausal women need to pay more attention to their weight so that the risk of breast cancer can decrease.

REFERENCES

- [1] Youlden, D., Cramb, S., Yip, C., Baade, P. Incidence and mortality of female breast cancer in the AsiaPacific region. *Cancer Biol Med* 2014;11:1018-115.
- [2] Ghoncheh, M., MahdaviFar, N., Darvishi, E., Salehiniya, H. Epidemiology, Incidence and Mortality of Breast Cancer in Asia. *Asian Pacific Journal of Cancer Prevention*. 2016; 17: 47-51.
- [3] Solikhah, S., Promthet, S., Rakkapao, N., Hurst, C. Validation of an Indonesian Version of the Breast Cancer Awareness Scale (BCAS-I). *Asian Pac J Cancer Prev*, 18 (2): 515-522.
- [4] Surakasula, A., Nagarjunapu, G., Raghavaiah, K. A comparative study of pre- and post-menopausal breast cancer: Risk factors, presentation, characteristics and management. *Journal of Research in Pharmacy Practice*. 2014; 3(1): 12-18.
- [5] Maccio, A., Mededdu, C. Obesity, Inflammation, and Postmenopausal Breast Cancer: Therapeutic Implications. *The Scientific World Journal*. 2011; 11, 2020–2036.
- [6] Chen, Y., Zhou, Q., Imam, M., et.al. Body mass index had different effects on premenopausal and postmenopausal breast cancer risks: a dose-response metaanalysis with 3,318,796 subjects from 31 cohort studies. *BMC Public Health*. 2017; 17: 936-945.
- [7] Sebastiani, F., Cortesi, L., Sant, M., et.al Increased Incidence of Breast Cancer in Postmenopausal Women with High Body Mass Index at the Modena Screening Program. *J Breast Cancer*. 2016; 19(3): 283-291.
- [8] Gravena, A., Lopes, T., Demitto, O., et.al The Obesity and the Risk of Breast Cancer among Pre and Postmenopausal Women. *Asian Pacific Journal of Cancer Prevention*. 2019; 19(9): 2430-2436.
- [9] Neuhouser, M., Aragaki, A., Prentice, L., et.al. Overweight, Obesity and Postmenopausal Invasive Breast Cancer Risk. *JAMA Oncol*. 2015; 1(5): 611–621.
- [10] Inyengar, N., Manson, J., Chlebowski, R., et.al. Association of Body Fat and Risk of Breast Cancer in Postmenopausal Women With Normal Body Mass Index A Secondary Analysis of a Randomized Clinical Trial and Observational Study. *JAMA Oncology*. 2018; 9(1): 64-75.