

THE DESCRIPTION OF HIP AND WAIST RATIO OF BREAST CANCER PATIENTS AT RSUP PROF. DR. I G.N.G. NGOERAH

Ni Putu Narumi Nandeari^{1*}, I Gede Budhi Setiawan², Putu Anda Tusta Adiputra²

¹Program Studi Sarjana Kedokteran, Fakultas Kedokteran Universitas Udayana

²Departemen Ilmu Bedah Fakultas Kedokteran Universitas Udayana

corresponding author:

Ni Putu Narumi Nandeari

Program Studi Sarjana Kedokteran, Fakultas Kedokteran Universitas Udayana

e-mail:deanarumi05@gmail.com

ABSTRACT

Background: Breast cancer is a type of cancer that grows and develops in the breast due to cells that grow abnormally. Statistically, it is showed that obesity is a risk factor for breast cancer, where the hip and waist ratio is closely related to obesity in humans.

Objective: To determine hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah.

Method: This research is descriptive observational with a cross-sectional type. The data was collected by recording the hip and waist ratio of breast cancer patients treated at the Surgical Oncology Polyclinic at RSUP Prof. Dr. I G.N.G. Ngoerah in April – June 2023 with a target of 30 samples.

Research results: Breast cancer patients are dominated by those aged ≥ 40 years (80%), with the most common breast cancer subtype being Luminal A (27%), the highest frequency of chemotherapy being once (57%), body mass index tends to be normal (70%), and the hip and waist ratio being low-risk (73%).

Conclusion: The description of the hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah is low-risk (<0.85) in 22 samples (73%) and high-risk (≥ 0.85) in 8 samples (27%).

Keywords: breast cancer, hip and waist ratio, body mass index

INTRODUCTION

Breast cancer refers to glandular cells, glandular ducts, and supporting breast tissue that grow abnormally, are infiltrative, destructive, and can metastasize¹. Every year, several types of cancer, including breast cancer, are the leading cause of death². Breast cancer can be caused by various factors, one of them is obesity. Obesity can be caused by excessive energy consumption that will stimulate the production of the hormone estrogen³. A habit of consuming fat will trigger the body to produce more of the estrogen hormone and make excessive division of body cells so that will triggers the emergence of breast cancer⁴. Obesity itself is related to the hip and waist ratio that aims to measure abdominal obesity that is dangerous for health. The greater the hip and waist ratio that indicates abdominal obesity, the higher the risk factor for developing breast cancer⁵.

BREAST CANCER & HIP AND WAIST RATIO

Breast cancer is a type of cancer that grows and develops in the breast. Breast cancer can attack various parts of the breast, such as the ducts that carry breast milk to the nipple (ductal cancer) or the glands that produce breast milk (lobular cancer)⁶. Breast cancer cases worldwide are higher in high-income countries such as North America. Mortality from breast cancer is usually higher in low- and middle-income countries such as sub-Saharan Africa and some developing countries in Asia⁷. Breast cancer is closely related to genetic changes in the DNA that causes normal breast cells to become cancer cells⁸. Genetic factors showed mutations in the BRCA 1, BRCA 2, and TP53 genes⁹.

Breast cancer has several risk factors, such as age, where the older you get, the higher the risk of developing breast cancer, especially when it is most often diagnosed at the age of 40 years and over. Breast cancer mostly happens in women, where a history of cancer in the opposite breast increases the risk of cancer in the contralateral breast. In addition, a family history of breast cancer has a two to three times higher risk of developing the same disease compared to patients who are not related. Breast cancer can also be caused by high exposure to the estrogen hormone in a

woman. Consumption of hormone supplements or therapy for contraception in women before menopause and hormone replacement therapy in postmenopausal women increases the risk of developing breast cancer¹⁰.

Apart from that, obesity is also risk factors for breast cancer. Obesity itself causes a 30% risk of suffering from cancers³. The habit of consuming fatty foods will trigger the body to produce more of the estrogen hormone and make an abnormal cell division process. The estrogen hormone in the body will accumulate in adipose tissue (fat tissue) that stimulates the growth of breast cancer⁴. In this case, breast cancer gland cells with positive estrogen receptor expression (ER+) will bind estrogen so that the amount of bound estrogen can be seen from the amount of adipose tissue. Compounds in fat also produce free radicals that can trigger the growth of breast cancer cells. Apart from that, the psychological response of obese sufferers can also cause stress and lead to breast cancer risk factors⁴. In addition, the hip and waist ratio factor as a measurement of central obesity is also positively related to breast cancer¹¹.

The hip and waist ratio is an anthropometric measurement of body shape influenced by sex, health, and fertility in women¹². This anthropometric hip and waist ratio is used for measure abdominal obesity closely related to metabolic risk factors and other diseases¹³. The hip and waist ratio is measured by dividing the waist circumference by the hip circumference. In women, the hip and waist ratio showed a high-risk if it is ≥ 0.85 and low-risk if it is < 0.85 ¹⁴. If the hip and waist ratio increases substantially in women, it can be a sign of an inflammatory process that can also increase mortality¹⁵. The hip and waist ratio are closely related to obesity in humans. The greater the hip and waist ratio the more it indicates an abdominal obesity. That is because the size of abdominal fat is positively associated with increasing body weight, where body weight is an integral part of the body mass index measurement used to determine nutritional status (underweight, normal, overweight, obese). Obesity can occur as a result of abnormal fat accumulation, thus disrupting health and increasing an individual's risk of death¹⁶.

METHOD

This study used a descriptive observational design with a cross-sectional approach, in which variables were measured at a single point in time. Data were collected by recording the hip-to-waist ratio of breast cancer patients who received treatment at the Surgical Oncology Polyclinic of RSUP Prof. Dr. I G.N.G. Ngoerah, Denpasar, from April to June 2023. The target population of this study was breast cancer patients in Bali, while the accessible population consisted of breast cancer patients who visited the Surgical Oncology Polyclinic during the study period. The sampling technique used was total sampling, where all subjects who met the inclusion and exclusion criteria during April–June 2023 were included in the study. The target sample size was 30 subjects.

The inclusion criteria were breast cancer patients who visited the Surgical Oncology Polyclinic during the study period. The exclusion criteria included patients who had undergone chemotherapy more than three times resulting in weight loss, and male breast cancer patients. The variables observed in this study included patient age, breast cancer subtype, frequency of chemotherapy, body mass index (BMI), and hip-to-waist ratio. Data collection was carried out quantitatively through measurements of body mass index and hip-to-waist ratio, as well as data retrieval from medical records.

The collected data were processed using Microsoft Excel, including data entry, validation, and categorization. The results were then presented descriptively in the form of tables and graphs. This study received ethical approval from the Research Ethics Commission of FK Unud/RSUP Prof. Dr. I G.N.G. Ngoerah Denpasar through ethical clearance letter number 539/UN14.2.2.VII.14/LT/2023.

RESULT

The results of this study show 30 breast cancer patients who were observed based on five variables, namely age, breast cancer subtype, frequency of chemotherapy, body mass index, and hip and waist ratio.

THE DESCRIPTION OF HIP AND WAIST RATIO OF BREAST CANCER PATIENTS...

Table 1. Data from research describing the hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah in april – june 2023

Variable	Frequency (N)	Percentage (%)
Age (years old)		
<40	6	20
≥40	24	80
Breast cancer subtype		
Luminal A	8	27
Luminal B	6	20
HER2+	6	20
Triple negative	5	17
Unclassified	5	17
Frequency of chemotherapy		
0 time	5	17
1 time	17	57
2 times	8	27
Body mass index		
Underweight (<18)	1	3
Normal (18-25)	21	70
Overweight (>25)	7	23
Obese I (30-35)	1	3
Obese II (>35)	0	0
Hip and waist ratio		
Low-risk (<0.85)	22	73
High-risk (≥0,85)	8	27

DISCUSSION

Based on the research results from the 30 samples above, 24 samples (80%) breast cancer patients found to have aged ≥40 years, and six samples (20%) have aged <40 years. The results of this research are in accordance with research by Narisuari & Manuaba (2020) at RSUP Prof. Dr. I G.N.G. Ngoerah in 2016 stated that from 50 samples that found the majority of breast cancer patients were ≥40 years old, where 27 people (42.18%) were in the 41-50 year age range, followed by 19 people (29.68%) aged >50 years, and four people aged <30 years¹⁷.

The results of this study support the theory by Alkabban & Ferguson (2020) that states breast cancer cases will increase with increasing age in the female population, or other words, the older you get, the greater the risk of suffering from breast cancer. Breast cancer cases are most often diagnosed at the age of 40 years and over¹⁰. It is caused by several factors like environmental factors, genetics, exercise, diet, obesity, and hormonal factors that are directly involved in the physiological development of cancer⁹.

Meanwhile, a description of the subtypes of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah in April – June 2023 can be seen from the following graph.

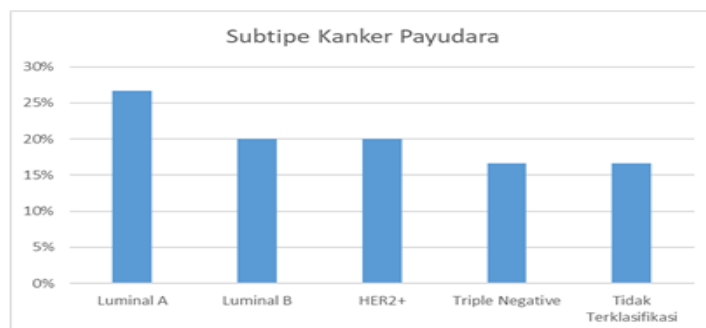


Figure 1. Description of subtypes of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah in april – june 2023

The most common breast cancer subtype found in samples was Luminal A with eight samples (27%), Luminal B and HER2+ each six samples (20%), the least common subtype was Triple Negative five samples (17%). There were five samples (17%) which were unclassified because the patient was clarifying the results of HER-2 immunohistochemistry that could not be determined as positive or negative through FISH/CISH examination at the reference laboratory.

That is slightly different from the results of research conducted by Aryawan (2018), which was based on immunohistochemical examination of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah in 2009 – 2013 showed that the Triple Negative subtype was the subtype with the highest incidence, namely 48 samples (36.9%), followed by Luminal A with 35 samples (26.9%), Luminal B with 21 samples (16.2%), HER2+ were 23 samples (17.5%) and there were three samples (2.3%) that could not be classified¹⁸. It will be interesting to further investigate the causes of the differences in the highest incidence of breast cancer based on the subtype of immunohistochemical examination.

Based on the frequency of chemotherapy, there are five samples (17%) who have not received chemotherapy, 17 samples (57%) who have received chemotherapy once, and eight samples (27%) who have received chemotherapy twice. In this case, chemotherapy is the essential therapy for breast cancer. However, chemotherapy also has side effects. There are supporting a decrease in appetite that causes energy and protein intake to be

lower. That will cause hypercatabolism and affect weight loss, making the calculations of body mass index and hip and waist ratio less valid¹⁹.

When viewed from the body mass index calculation, the majority of the samples had Normal status (BMI 18-25), namely 21 samples (70%), Overweight (BMI >25) with seven samples (23%), and Obese I (BMI 30-35) with one sample (3%), and Underweight (BMI <18) with one sample (3%). The results of this research are similar to the researchs by Gelgel & Christian (2020) at RSUP Prof. Dr. I G.N.G. Ngoerah in 2014 – 2015 showed that the majority of samples had Normal BMI status, namely 45 samples (52.3%), followed by Obese I with 18 samples (20.9%), Overweight with 16 samples (18.6%), Obese II with four samples (4.7%), and the least was Underweight with three samples (3.5%)²⁰. However, despite the dominant number of samples having a Normal BMI, there are available patients with Overweight and Obese. This is in line with the theory by Irena (2018) that states excess nutritional status (overweight and obesity) can also be a risk factor of breast cancer, where excessive energy consumption can stimulate the production of the estrogen hormone that will triggers abnormal division of body cells³.

Based on the hip and waist ratio of the 30 samples above, there are eight samples (27%) found to have a high-risk ratio (≥ 0.85), in which four of them also had an excessive BMI (overweight). Description of the hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah in April – June 2023 can be seen in the following graph.

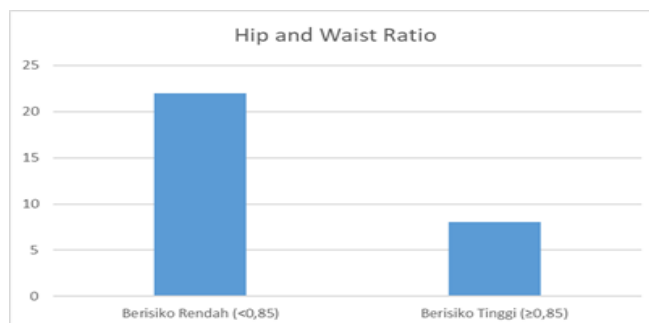


Figure 2. Description of the hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah in april – june 2023

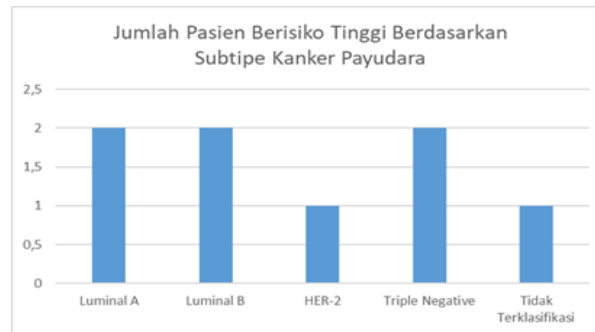


Figure 3. Description of the number of high-risk patients based on breast cancer subtype

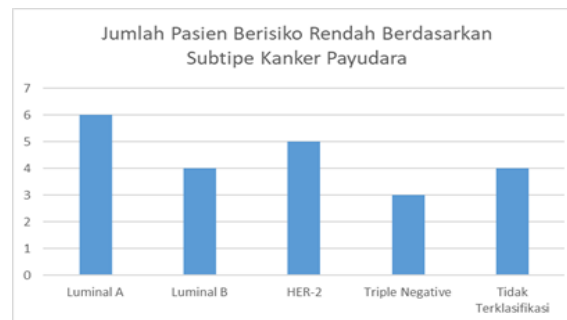


Figure 4. Description of the number of low-risk patients based on breast cancer subtype

A high BMI indicates that someone is experiencing general obesity but cannot differentiate fat mass and lean body mass components so it cannot reflect body shape. Meanwhile, the hip and waist ratio here shows central obesity, how the distribution of body fat, especially is deep abdominal fat, around visceral organs which leads to the development of metabolic disease, including the risk of cancer²¹. Based on the data above, 50% of the samples who have a high-risk ratio also have a high BMI, which shows that someone who suffers from central obesity also tends to suffer from general obesity.

However, apart from the dominant number of samples showing a low-risk ratio, there are still patients who also have a high-risk ratio so this is in line with the relationship between the hip and waist ratio and breast cancer that the greater the hip and waist ratio, the more indicates abdominal obesity and also the higher the risk factor for breast cancer. However, this study has the possibility bias due to weight loss or changes in body proportions influenced by the side effects of chemotherapy.

CONCLUSIONS AND SUGGESTIONS

Based on the results on the hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah, 30 samples met the inclusion and exclusion criteria. It can be concluded that the description of the hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah is low-risk (<0.85) as many as 22 samples (73%) and high-risk (≥ 0.85) as many as eight samples (27%).

In connection with the results of research that the author has conducted regarding the description of the hip and waist ratio of breast cancer patients at RSUP Prof. Dr. I G.N.G. Ngoerah it is

recommended that other researchers study more deeply the relationship between hip and waist ratio and the factors that play a role in the development of breast cancer to enrich knowledge about this. It is also recommended to minimize bias in measuring BMI and hip and waist ratio, specifically due to the side effects of chemotherapy so that measurements are more valid and interpretation is more appropriate. Aside from that, the author also suggests that readers can adopt a healthy lifestyle to prevent breast cancer.

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