



Age as a Determinant in Selecting Type of Breast Cancer Surgery in Lovely Pink Solo Cancer Community

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Abstract

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BACKGROUND: Breast cancer is one of the most common malignancies in Indonesia. Breast cancer occurs due to rapid and abnormal cell growth due to infiltration of lymphatic tissue and blood vessels. For this reason, surgery is vital to use as a treatment for breast cancer at an early stage. There are two surgical methods: Breast-conserving Surgery (BCS) and mastectomy. In this regard, several factors have been studied to influence patients in choosing BCS or mastectomy. Looking at the age factor, the results varied and differed significantly throughout the study.

AIM: We aimed to investigate age as a determinant in selecting type of breast cancer surgery in lovely pink solo cancer community.

METHODS: This analytical study used a retrospective cross-sectional approach. The research subjects were patients with breast cancer who were the Lovely Pink community members in Surakarta City, Central Java. They were selected by simple random sampling with inclusion criteria consisting of female patients aged 20–80 years, being diagnosed with stage 1 and 2 breast cancer, and having received surgery employing BCS or mastectomy techniques.

RESULTS: This study was conducted on 218 breast cancer patients who had undergone mastectomy or BCS in Surakarta City, Central Java. It was found that 104 patients were <50-year-old and 114 patients >50 years old. 76 patients (34.9%) and 142 patients (65.1%) had a total income of more or less than Rp2.5 million/month. As many as 155 patients (71.1%) and 63 patients (28.9%) had no history of disease. Based on the type of surgery performed, 141 patients (64.7%) underwent mastectomy, and 77 (35.3%) underwent BCS.

CONCLUSION: It can be concluded that patients prefer to undergo mastectomy with significant results at the age of under and above 50 years, supported by income, medical history, and work history.

Introduction

Breast cancer is one of the most common malignancies in Indonesia. Based on Pathological Based Registration in Indonesia, breast cancer ranked first in malignancy cases with a relative frequency of 18.6% (Cancer data in Indonesia in 2010 according to histopathological data from the Cancer Registration Agency, Association of Indonesian Pathology Specialists [IPS], and the Indonesian Cancer Foundation [ICF]) [1].

Its incidence rate is predicted to increase, and is more likely to attack at a young age. It is where breast cancer generally attacks women in their 40s as a result of their lifestyle. In Indonesia, breast cancer is the second leading cause of death out of ten existing cancers with cervical cancer as the number one. Breast cancer occurs due to rapid and abnormal cell growth due to infiltration of lymphatic tissue and blood vessels [1].

Furthermore, the American Joint Committee on Cancer (AJCC), sponsored by the American Cancer Society and the American College of Surgeons, categorizes breast cancer based on the TNM system and stage, the AJCC Cancer Staging Manual, 8th Edition, and divides breast cancer by clinical stage as shown in Table 1.

In the early stages, breast cancer is asymptomatic or without symptoms or signs. The most common symptom is a lump or thickened breast. Pain in the breast or tenderness is also a sign of breast cancer. If the spread of breast cancer has occurred, there will be swelling or a lump around the axillary lymph node [5].

When there is a palpable mass, the next step is to perform additional diagnostic tests, such as mammography or ultrasound [2], [3].

In addition, a cytological examination to diagnose breast cancer is a fine needle aspiration biopsy. The assessment is in the form of cells, cytoplasm,

Table 1: Breast cancer staging based on American Joint Committee on Cancer staging manual, 8th edition

Stage	TNM
Stage 0	Tis, N0, M0
Stage IA	T1, N0, M0
Stage IB	T0, N1mi, M0 T1, N1mi, M0
Stage IIA	T0, N1, M0 T1, N1, M0 T2, N0, M0
Stage IIB	T2, N1, M0 T3, N0, M0
Stage IIIA	T0, N2, M0 T1, N2, M0 T2, N2, M0 T3, N1, M0 T3, N2, M0
Stage IIIB	T4, N0, M0 T4, N1, M0 T4, N2, M0
Stage IIIC	Any T, N3, M0
Stage IV	Any T, Any N, M1

T: Tumor, N: Nodule, M: Metastasis

and nucleus. Besides, establishing a diagnosis for breast cancer is also called a triple diagnosis, starting from a detailed clinical examination, mammography examination, to cytological examination [10].

Moreover, one of the primary modalities of breast cancer therapy is surgery. Surgical options include breast-conserving surgery (BCS) and mastectomy. Although BCS becomes the standard surgical treatment for breast cancer, many women must or want to undergo a mastectomy [17].

In a cohort study conducted in 1998–2014 on 7565 women with early-stage invasive breast cancer, it was found that, in terms of local recurrence, the group undergoing BCS had better local control than those undergoing mastectomy. In addition, it was also uncovered that the cumulative recurrence incidence of metastases to lymph nodes within ten years was 2% in women who underwent BCS and 5.8% in those who underwent a mastectomy. The study also showed that, at 10 years, the overall survival rate was significantly higher in the group undergoing BCS, followed by radiotherapy, compared with the group undergoing mastectomy alone. Thus, it could be denoted that, overall, BCS provides a better outcome compared to delayed adjuvant mastectomy [15].

Overall, BCS has the advantage, namely that it suits most patients' preferences, so BCS is generally the preferred choice. Apart from outcomes, BCS has other advantages when viewed from the aspect of lower psychological impact, lower anxiety, improved patient body image, sexual satisfaction, and self-esteem. Although the data suggest that reconstruction immediately after mastectomy with good results can improve the patient's quality of life, another advantage of BCS is that the patient can avoid axillary dissection [16].

On the other hand, mastectomy as a treatment for breast cancer can also affect a woman's assessment of her own body. Some women are uncomfortable wearing their clothes, have difficulty finding fit clothes, and avoid recreational activities, such as going to the pool. Furthermore, women often feel unbalanced,

incomplete, or asymmetrical, and view themselves as flawed or imperfect [12], [14].

For this reason, early detection and multimodality therapy developed have improved the survival of patients with breast cancer. When first diagnosed, patients with breast cancer must decide the surgery type and adjunctive therapy, each with its risks and benefits. The decision-making process is complex and influenced by many factors, including patient age, comorbidities, ethnicity, education, and the availability of visual and written handouts [12], [14], [17].

Looking only at the age factor, the results varied and differed significantly throughout the study. It is where older women, in most studies, supported the choice of mastectomy. Nine studies concluded this, with most studies having good sample sizes, and six studies employed stratified age analyses. In contrast, only three studies have shown older women choosing BCS, all of which had a sample size below 400 and used a mean age ratio [17].

Further, older women prefer to take a more passive role in decision-making and rely heavily on physician recommendations. In contrast, younger women are more actively involved in care decisions and seek information from various sources, such as the Internet, friends, family members, and support groups [18], [21].

The decision in choosing this surgical procedure is entirely in the patient's hands. However, medical personnel must explain each procedure's advantages and disadvantages, especially for young patients, and direct them to the right choice according to the patient's medical condition.

Methods

This analytic study used a retrospective cross-sectional approach with ethical clearance number 55/UN27.06.6.1/KEP/EC/2021 from the Research Ethics Committee, Faculty of Medicine Universitas Sebelas Maret, Surakarta.

The research subjects consisted of breast cancer patients who were the Lovely Pink cancer community members in Surakarta City, Central Java. Subjects were selected based on inclusion criteria comprising female patients aged 20–80 years, being diagnosed with stage 1 and 2 breast cancer, having undergone surgery employing the BCS or mastectomy technique, and having agreed to participate in the study. The data of patients' surgery preference informed consent before surgery were collected from medical records.

Respondents were then divided into two groups: patients who underwent mastectomy surgery and patients who underwent BCS. In addition, the

respondents' age was stratified into two groups: Less than 50 years and more than 50 years.

The patient's comorbidities were analyzed in terms of variables that interfere with the choice of breast surgery method. Comorbid factors in these patients include patients with pregnancy, history of radiation to the chest wall or breast, active disease in supporting tissues and skin (especially scleroderma and lupus), and women with a genetic predisposition to breast cancer.

Univariate analysis was conducted to see the description of the respondent distribution. Meanwhile, bivariate analysis was carried out utilizing the contingency coefficient test to see the relationship between patient age and the choice of surgical method BCS or mastectomy.

The data are presented in a table that presents the frequency, mean value, data standard deviation, minimum data value, and maximum value. Confounding variables such as age, income, and occupation were analyzed in a category.

Results

This study was conducted on 218 breast cancer patients undergoing mastectomy or BCS who were randomly selected from the Lovely Pink Solo community members in Surakarta City, Central Java, from June to October 2021. The study was conducted by asking questions about age, occupation, history of other diseases, and the type of surgery performed, mastectomy or BCS. Characteristics of research subjects are presented in the value of the frequency distribution (%).

In this study, it was found that 104 patients (47.7%) were <50-year-old, and 114 patients were >50-year-old (52.3%). From the character of the occupation, they were divided into 100 in-house patients (45.9%) and 118 office worker patients (54.1%). The income earned each month was divided into 2 categories, namely <2.5 million/month for 76 patients (34.9%) and >2.5 million/month for 142 patients (65.1%). A total of 155 patients (71.1%) presented with other systemic diseases while 63 patients (28.9%) had no history of disease. For the type of surgery performed, 141 people (64.7%) had mastectomy and 77 people (35.3%) had BCS.

Characteristics of research subject in Table 2 shows that the mastectomy group was chosen by 53.2% of the woman group aged <50 years. Meanwhile, in the BCS group, 62.3% were chosen by women aged >50 years.

For occupation, mastectomy was chosen by office workers. BCS surgery was also chosen by office workers with the rates of 54.6% and 53.2% for mastectomy and BCS, respectively.

Table 2: Characteristics of research subject

Characteristics	Number	Mastectomy, total (%)	BCS, total (%)
Age (years)			
< 50	104	75 (53.2)	29 (37.7)
> 50	114	66 (46.8)	48 (62.3)
Total		141 (100)	77 (100)
Occupation			
Inhouse	100	64 (45.4)	36 (46.8)
Outside	118	77 (54.6)	41 (53.2)
Total		141 (100)	77 (100)
Income			
< 2.5 million rupiah/month	76	46 (32.6)	30 (39.0)
> 2.5 million rupiah/month	142	95 (67.4)	47 (61.0)
Total		141 (100)	77 (100)
Comorbidities			
None	155	101 (71.6)	54 (70.1)
Exist	63	40 (28.4)	23 (29.9)
Total		141 (100)	77 (100)

BCS: Breast-conserving surgery

For the data on income, mastectomy and BCS are both options for people with an income of >2.5 million/month of 67.4% and 61.0% for mastectomy and BCS, respectively.

For comorbidities with and without cancer history, mastectomy and BCS were equally preferred by patients without a previous medical history with the rates of 71.6% and 70.1%, respectively.

Bivariate and multivariate analyses in Table 3 show that age determines the type of surgery. These data analysis employed Chi-square. There was only one meaningful factor, namely age. For the type of surgery, patients aged >50 years tend to choose BCS and <50 years tend to choose mastectomy.

Table 3: Bivariate and multivariate analyses (the main outcome in this study is selecting breast conserving surgery)

Variable	Bivariate		Multivariate	
	OR (CI 95%)	p	OR (CI 95%)	p
Age > 50 year old	1.88 (1.06–3.31)	0.028	1.93 (0.29–5.05)	0.024
Work outside	0.94 (0.54–1.65)	0.847	-	-
Income > 2.5 m	0.75 (0.42–1.35)	0.348	0.71 (0.30–1.20)	0.272
Comorbidities	1.07 (0.58–1.98)	0.815	-	-

OR: Odds ratio, CI: Confidence interval.

Then, for income with a p-value of 0.348, it had less significant results, but, because it was less than 0.35, it was included in the multivariate analysis with the age factor.

Occupational and medical history with p-values of 0.847 and 0.815, respectively, were not significant and were not included in the multivariate analysis.

The multivariate analysis still showed that the age factor had a significant influence on the determination of the type of surgery ($p = 0.024$). Meanwhile, fixed income was not significant ($p = 0.272$).

Therefore, age is an independent factor that influences the choice of type of surgery.

Discussion

Breast cancer is the most common cancer worldwide with 25.2% of cases in women and 14.7% of

deaths.25 Survival rates are much lower in developing countries compared to developed countries (80% vs. less than 40%), and breast cancer deaths in developing countries account for 58% of all breast cancer deaths worldwide [25], [26].

This study found that, of 104 adult patients (<50 years), 75 patients (67.3%) chose mastectomy, and 29 patients (36.7%) chose BCS for the treatment they received. This is different in the elderly (≥ 50 years); from 114 patients, 66 patients (73.7%) chose mastectomy, and 48 patients (40.3%) chose BCS. The difference in these two groups was very significant where most patients at the age of <50 years chose mastectomy while those at the age of ≥ 50 years chose BCS.

We found in this study that patients in Surakarta prefer to go with mastectomy due to several reasons, including being afraid of radio and chemo treatment, feeling safer and less worried if all the tumors have been lifted from their bodies and, family intervention giving a significant value for the patient to choose mastectomy procedure because neither of the patient nor her spouse has any problem with the shape of her body after surgery.

Some of the patients are concerned with BCS as it may have more implications in the long hours of treatment, especially radiotherapy. The probability of cancer may play a significant role because they believe that they still have the place of the tumor that cancer may come back again.

Younger patients prefer mastectomy because the treatment time is shorter so they can return to their activities or return to their jobs earlier.

Older patients prefer to undergo BCS because the decision to choose surgery depends more on the doctor's recommendation. Another reason that patients prefer BCS is that it requires minimal surgery and maintains the shape of the breast.

A similar study was conducted by Sinnadurai *et al.* by collecting data for 15 years from 1995 to 2011 at 4 hospitals in Malaysia, Singapore, and Hong Kong, involving 3,536 research samples. The result was that 63.5% performed mastectomy compared to BCS although the trend of BCS procedures was increasing every year [26].

In the United States, BCS has been a standard procedure since it was declared in a consensus in the 1990s. Studies from the Mayo-clinic mastectomy rate decreased from 45% in 1997 to 31% in 2003. After that, the number increased even to close to 60% with a mastectomy decision-making approach with magnetic resonance imaging (MRI)/clinical approach [27]. Patients with a family history of cancer are genetically at risk for radiotherapy, and the explanation of ultrasound and MRI breast reconstruction is another reason why mastectomy is preferred. A study at Moffitt Florida Cancer Center on 5,865 cases showed that mastectomy increased significantly from 33% from 1999 to 2003 to

44% between 2004 and 2007 ($p < 0.01$). Most cases (89%) were between stages 0 to II [28].

Family history is the risk of breast cancer (two or more cases in women younger than 50 years or three or more at any age). Patients with BRCA (-) are approximately 11 times more likely to develop breast cancer. The history of early breast cancer in close relatives is a risk factor for breast cancer in BRCA1 and BRCA2 carriers. A hospital cohort study of 5359 women explained that no association was found between a family history of breast cancer and the severity or mortality although the patients tend to choose mastectomy over BCS as it is more beneficial [29].

The prevalence of mastectomy procedures in the Asian region has been highlighted in several studies. A study in Malaysia showed that about one of two patients with stage I breast cancer chose a mastectomy. Similarly, a small-scale study in Singapore revealed that about 75% of women with breast cancer under the age of 40 underwent mastectomy [30], [31]. Meta-analysis research in 2015 found no significant difference in the risk of death between young women (<40 years of age) who underwent BCS and mastectomy. A prospective cohort study of women < 40 years of age in Denmark with T1-2N0M0 breast cancer demonstrated an increased risk of breast cancer-specific and all-cause mortality associated with BCS [32], [33].

Mastectomy causes psychological impacts on patients, including fear of cancer, feelings of imperfection in the body, discomfort in work and social communication, and lack of sexual activity [35]. Zhao *et al.* conducted a study on 90 patients, 79% of whom considered breast reconstruction unnecessary. Conditions differ by age, occupation, income, and place of residence. This has resulted in a high rate of mastectomy compared to BCS, especially in the Asian region [35], [36].

Depression and anxiety are the most common psychological effects of breast cancer and mastectomy. In a Korean study, Kim and Die observed that depression was highly prevalent in mastectomy breast cancer patients, increasing the risk for suicidal intentions.38 In contrast, the results of Anim-Sampong *et al.*'s study showed that only about 10% of patients experienced depression, and 84% did not have suicidal thoughts due to mastectomy. This reason is associated with Ghanaian socio-cultural values which dislike suicidal tendencies. Other possible reasons are old age and, therefore, there is no need to breastfeed children, and divorced couples are less concerned about their problems for their surgical scars [37], [38]. Surakarta as part of the Surakarta Hadiningrat palace in the province of Central Java, Indonesia, holds very high cultural values and customs. Respect for women as mothers makes post-mastectomy aesthetics likely not a problem [12], [37], [38].

The amount of income, history of other diseases, and the type of work in this study did not

provide a significant difference in the assessment of the actions performed, either mastectomy or BCS. Benedict *et al.* conducted a study on what factors led to an increase in the number of patients undergoing mastectomy compared to BCS. Some of the reasons include fear of implementation and post-radiation care. Faster healing time was identified as the most important factor in choosing mastectomy [39].

Conclusion

Age has a significant difference as the factor of breast cancer patients' surgery preferences of mastectomy or BCS. Patients more than 50 years old tend to choose BCS while those less than 50 years old prefer mastectomy. Other factors such as income, medical history, and work history have no significant influence on surgery preferences of mastectomy and BCS.

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Author Contribution

Hanum Faeni: writing the manuscript and the first author. Kristanto Yuli Yarso: designing and the corresponding author. Brian Wasita: analyzing. Rachmi Fauziah Rahayu: Collecting data. Suyatmi: Collecting data. Nanang Wiyono: Collecting data. Riza Noviera Persik: Collecting data. Iman Hakim Wicaksana: Collecting data. Akhmad Azmiardi: Analyzing data. Zhafira Ramadhanty: Interviewing.

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