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Artikel Penelitian

Characteristics of Breast Cancer Patients at RSUP Dr. M. Djamil Padang

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A B S T R A C T

Abstract

Background: *Breast cancer is the most common cancer in women in Indonesia and worldwide. Among the proven risk factors are age, age of menarche, age of menopause, history of hormonal birth control use, number of parities, breastfeeding history, family history of breast cancer, and smoking history.*

Objective: *This study was conducted to identify the risk factors and distribution of breast cancer patients based on risk factors at Dr. M. Djamil Padang Hospital from 2022 to 2023.*

Methods: *This study is a retrospective descriptive study. The study sample consisted of breast cancer patients at RSUP Dr. M. Djamil Padang and was selected using a consecutive sampling technique. Data was taken from the patient's medical record and processed using the SPSS application to obtain a distribution of patients based on risk factors.*

Results: *The study obtained a sample of 52 people, meeting the inclusion and exclusion criteria. The majority of patients were aged 40–49 (40.4%), menarche at the age of 13 and 14(50%), not yet menopause (26.9%), using hormonal birth control for 5 years and more (42.3%), having two children (34.6%), breastfeeding duration of 24 to 35 months (50%), not having a family with breast cancer (88.5%) and never smoked but was a passive smoker (92.3%).*

Conclusions: *Exposure to risk factors increases the incidence rate of breast cancer.*

Keywords: *reproductive period, family history, smoking*

What is already known?

Breast cancer has caused immense suffering for too many women. The mortality rate of breast cancer increases significantly each year.

What is added?

Being the deadliest cancer among women, breast cancer can still be prevented if one is aware of the condition and avoids the risk factors.

Abstrak

Latar Belakang: Kanker payudara merupakan kanker tersering pada wanita di Indonesia bahkan di seluruh dunia. Antara faktor risiko yang telah terbukti adalah usia, usia menarche, usia menopause, riwayat penggunaan KB hormonal, jumlah paritas, riwayat menyusu, riwayat keluarga dengan kanker payudara dan riwayat merokok.

Objektif: Penelitian ini dilakukan untuk mengetahui faktor risiko dan distribusi pasien kanker payudara berdasarkan faktor risiko di RSUP Dr. M. Djamil Padang pada tahun 2022-2023.

Metode: Penelitian ini merupakan penelitian deskriptif retrospektif. Sampel penelitian adalah pasien kanker payudara di RSUP Dr. M. Djamil Padang dan dipilih menggunakan Teknik consecutive sampling. Data diambil dari rekam medis pasien dan diolah menggunakan aplikasi SPSS untuk mendapatkan sebaran distribusi pasien berdasarkan faktor risiko.

Hasil: Hasil penelitian mendapatkan sampel sesuai kriteria inklusi dan eksklusi adalah sebanyak 52 orang. Mayoritas pasien berusia diantara 40-49 tahun (40,4%), menarche pada usia 13-14 tahun (50%), belum menopause (26,9%), menggunakan KB hormonal selama 5 tahun dan lebih (42,3%), mempunyai 2 orang anak (34,6%), menyusu selama 24-35 bulan (50%), tidak mempunyai keluarga dengan kanker payudara (88,5%) dan tidak pernah merokok namun merupakan perokok pasif (92,3%).

Kesimpulan: Paparan kepada berbagai faktor risiko meningkatkan angka kejadian kanker payudara.

Kata kunci: masa reproduktif, riwayat *keluarga, merokok*

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Introduction

Breast cancer has the second-highest incidence for both sexes in the world, following lung cancer. It remains the leading cause of cancer-related morbidity and mortality in women across the globe. According to GLOBOCAN, almost 2.3 million new cases and 666,000 deaths were recorded in 2022. Asia accounts for 42.9% (985 thousand) of the incidence, with a mortality rate of 47.3% (315 thousand), followed by Europe, which has an incidence rate of 24.3% (557 thousand) and a mortality rate of 21.7% (144 thousand).[1]

Breast cancer is a carcinoma originating from the lobes, ducts of the breast, and even the fat tissue and connective tissue of the breast. The exact cause of breast cancer is yet to be known, but several factors have already been determined to be contributing factors to the risk of breast cancer. Older adults, early menarche, late menopause, use of hormonal contraception, relatives with breast cancer, and smoking are presumed to increase the risk, while parity and breastfeeding can decrease the risk.[2,3]

Usually, DNA can break and form double-strand breaks (DSBs) easily when cells undergo mitosis, are exposed to radiation, or are exposed to genotoxic agents. BRCA1 and BRCA2 are two out of many *tumor suppressor genes (TSGs*) in human genes. These genes are used to repair DNA that encounters DSB, called homologous recombination (HR), which is aided by TSG.[4,5]

If these genes were mutated, DSBs cannot be fixed and will later undergo chromosomal rearrangements, resulting in an unstable genome. Genes that become unstable cannot control what happens in a cell, let alone the cell cycle; therefore, cells divide uncontrollably and become cancer cells.[5]

Mai Tran *et al.* found that Korean women who have first-degree relatives with breast cancer have a high risk of developing breast cancer, and most of them were aged 40 – 49.[6] Hajima *et al.* found that the risk doubled every 1 year of early menarche or late menopause. Premenopausal women have a 40% higher risk compared to menopausal women of the same age. The risk also significantly decreased after menopause.[7]

Gammon *et al.* show that the risk doubled in women exposed to tobacco smoke from their partner.[8] Bara´nska *et al.* found that use of oral contraceptives increases the risk of Triple-Negative Breast Cancer (TNBC) and Estrogen Receptor-negative (ER-) breast cancer while decreasing the risk of ER+ breast cancer. Risk of TNBC increased significantly in women who use oral contraceptives for 5 years or more.[9]

There have been 2323 cases of breast cancer recorded at RSUP Dr. M. Djamil Padang in 2014. The incidence declined to 1,127 cases in 2015, and then spiked to 4,241 cases in 2016. However, the incident rate decreased in 2017, with only 2,106 cases.[10] This research aimed to determine the characteristics of breast cancer patients at RSUP Dr. M. Djamil Padang.

Methods

This was a retrospective descriptive study. The data was taken from the medical records of breast cancer patients treated at RSUP Dr. M. Djamil Padang from October 2022 to December 2023. A sample of 52 patients was chosen using a consecutive sampling technique as per the inclusion criteria, which included all breast cancer patients who had been diagnosed, referred, and treated in RSUP Dr. M. Djamil, and were excluded if they had a history of other primary cancer, were male, or had incomplete medical records.

Univariate analysis was used to get the distribution of breast cancer patients based on age, age of menarche, age of menopause, use of hormonal contraception, parity count, breastfeeding duration, family history of breast cancer, and smoking status.

This study has had ethical approval from the Health Research Ethics Committee of RSUP Dr. M. Djamil Padang (DP.04.03/D.XVI.XI/340/2024).

Results

52 out of 1135 breast cancer patients' medical records were taken based on inclusion and exclusion criteria and presented in the table below:

Table 1. Distribution of breast cancer patients

Characteristics		n	%
Age	≥60	5	9.62
	50-59	11	21.15
	40-49	21	40.38
	30-39	11	21.15
	<30	4	7.7
Age of menarche	>16	1	1.92
	15-16	12	23.08
	13-14	26	50
	≤12	13	25

Characteristics		n	%
Age of menopause	Not menopause	14	26.92
	≥55	4	7.69
	50-54	12	23.08
	45-49	13	25
	<45	9	17.31
Hormonal contraception use duration	≥5 years	22	42.31
	<5 years	17	32.69
	Never use	13	25
Parity count	≥4	15	28.85
	3	13	25
	2	18	34.61
	1	2	3.85
	None	4	7.69
Breastfeeding duration	0-11 months	13	25
	12-23 months	13	25
	24-35 months	26	50
	36-47 months	0	0
	≥48 months	0	0
Family history of breast cancer	≥3	0	0
	2	1	1.92
	1	5	9.62
	None	46	88.46
Smoking status	Active smoker	1	1.92
	Ever smoke	2	3.85
	Never smoke (passive smoker)	48	92.31
	Never smoke (non-passive smoker)	1	1.92

Discussion

Despite the cause remaining unknown, there are many factors proven to contribute to the progression of breast cancer. Age can be used to signify how long women have been exposed to the risk factors. Prolonged exposure to the risk factor causes an increased risk of breast cancer. Additionally, older women tend to have an impaired or reduced ability to repair broken genes.[11,12]

In a study by Laella *et al.* at RSUD Arifin Achmad Pekanbaru from 2010 to 2012. Among 95 breast cancer patients, 36.8% were aged 40–49, followed by 27,4% aged 50–59.[13] Another study by Dewa Ayu *et al.* on 64 breast cancer patients at RSUP Sanglah in 2016 found that 42.18% of the patients were 41–50 years old and 29.68% were 50 years old or older.[14]

Age of menarche and menopause are also considered risk factors of breast cancer. Menarche at an earlier age or menopause at a later age means women stay in the reproductive period longer. Women's bodies, particularly breast tissue, will be exposed to estrogen and progesterone for a longer period, thus increasing the risk.[15,16]

In a study at RSUP H. Adam Malik in 2019–2020, Duri *et al.* found that 66 out of 100 breast cancer patients had their menarche at age 12.[17] Ariana *et al.* show that the respondents at RSUD Tugurejo Semarang have 4.015 times higher risk if they menarche at age 12 or younger.[18]

Among 77 breast cancer patients at RS Ibnu Sina Makassar in 2018, Sulistia *et al.* found that 64.9% were not menopausal.[19] In a study by Hj. Risnawati *et al.* on 106 respondents in RS Ibnu Sina Makassar in 2018, reproductive women have 2.44 times higher risk compared to menopausal women.[20]

In addition to this, hormonal contraceptive also works similarly to the reproductive period. A hormonal contraceptive is an external synthetic hormone of estrogen and progesterone. It is used to suppress ovulation, preventing menstruation, while also binding to breast tissue continuously.[21]

Awaliyah *et al.* in their study on 250 respondents at RS Sarditjo in August–November 2016 found that using hormonal contraception for 5 years or longer increases the risk by 2.25 times compared to never using hormonal contraception.[22] This result supported a study by Ditya *et al.* on 192 respondents at RSUD Dr. Soetomo Surabaya from February to April 2015. She found that women who use hormonal contraception have a 2.99 times higher risk compared to women who do not use it.[23]

On the other hand, having a child can decrease the risk of breast cancer. There have been four theories proposed to explain the decreased risk. The prominent theory suggests that the hormonal surge during pregnancy desensitizes the Mammary Epithelial Cell (MEC), thus reducing the risk. Another widely accepted theory proposes that cancer originates from a stem cell because of its proliferative potential, which also happens to be in the breast. Each pregnancy eliminates these stem cells and promotes differentiation [24,25]

Bui *et al.* stated that the risk of luminal B-type breast cancer and TNBC was reduced in women with more than two children in Vietnam.[15] This result is also proven by a study from Ayu *et al.* at RSUD Dr. Soetomo Surabaya. She found that women with only two children have a 1.93 times

higher risk compared to those with four children or more.[23]

In addition to having so many benefits, breastfeeding can also reduce the risk of breast cancer by suppressing ovulation in a method called amenorrhea lactation. Prolactin is a crucial hormone in the production of milk. Prolactin secretion suppresses the secretion of *Luteinizing-Hormone Releasing Hormone* (LHRH) and prevents *Luteinizing Hormone* (LH) surge, which is essential for ovulation, thus lowering the exposure of estrogen and shortening the reproductive period.[26,27] Besides, breastmilk also contains *Human Alpha-lactalbumin Made LEthal to Tumor cells* (HAMLET), which can induce apoptosis of tumor cells and exfoliate MEC that contain broken DNA, while also inducing the differentiation of MEC.[28]

Shofia Kamilina and Dian Mediana conducted a study at three RS Kanker Dharmais in October–November 2023, where they found that breastfeeding for 6 months or longer reduces the risk of breast cancer.[29] Another study by Min-Min Tan et al. at the University of Malaya Medical Centre (UMMC) and Subang Jaya Medical Centre (SJMC) stated that breastfeeding, using soy-based products, and engaging in physical activities can reduce the risk of breast cancer.[30]

Family history of breast cancer is also one of the risk factors for breast cancer. Mutated BRCA1 and BRCA2 can be inherited from a mother to her children.[23] The discrepancy between theories and our findings is due to several factors. Firstly, women are more aware of the serious risk of breast cancer if a relative is diagnosed with breast cancer, hence adopting a balanced and healthy lifestyle. Second, a lot of women are not appropriately diagnosed in healthcare centres, therefore, they and their relatives remain unaware of their condition.[23]

According to a study from Nurul Isnaini at RSUD Dr. H. Abdul Moeloek Lampung in 2015, women who have a relative with breast cancer have 2.961 times higher risk of breast cancer compared to those who do not.[31] A study by Rianti *et al.* at RS Kanker Dharmais Jakarta in 2011 also reached the same conclusion. Having relatives with breast cancer increases the risk by 5.4 times.[32]

Finally, cigarette smoke can negatively affect our health and increase the risk of breast cancer. Cigarette smoke contains Polycyclic Aromatic Hydrocarbons (PAHs) that can bind to DNA, causing mutations in the TP53 gene. Mutated TP53 prevents the synthesis of the p53 protein, a protein that regulates mitosis and contributes to the development of breast cancer.[33] Nicotine in the smoke also stimulates the proliferation of cells and the antiapoptotic cascade while suppressing the anticancer immunosurveillance process in our body.[34]

A study by Leida *et al.* at four RS Kota Makassar in October–November 2016 stated that the risk increases 2,579 times in passive smoker women compared to non-passive smoker women.[35] Alexandra *et al.* reached the same conclusion in their 2017 study. The risk increases in women who have been exposed to cigarette smoke from a young age.[36]

These observations suggest that the Health Department should promote early screening for breast cancer at the age of 40. Additionally, education on smoking and hormonal contraceptives needs to be prioritized as these appear to be modifiable major risk factors. As a practitioner, a negative family history of breast cancer does not indicate low risk; instead, finding and focusing on other risk factors thoroughly is necessary.

However, this study has a limitation. First, the small sample size (52 patients) limits the generalizability of this study, as thousands of patients are recorded at RSUP Dr. M. Djamil yearly. Additionally, this study does not measure the patient's BMI, despite obesity being another significant risk factor. Other than that, the patients are not categorized according to the subtype of breast cancer. While a mutated gene induces breast cancer, there are no genetic tests to confirm the mutation among patients, and this study only relies on the family history.

Conclusion

From this study, it can be concluded that the majority of breast cancer patients are aged 41–49, menarche at age 13–14, not menopause, have used hormonal contraception for 5 years or longer, have two children, breastfeeding for 24–35 months, do not have a relative with breast cancer, and a passive smokers.

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