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Review Article Factors Affecting the Occurrence of Breast Cancer Among Women in 2018

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Abstract

One type of cancer with a high incidence is breast cancer and cause of death number 7 (5.7%) in Indonesia. Aim: To determine the factors affecting the occurrence of breast cancer among women. Methods: This study used literature studies from PubMed, Science Direct and ProQuest databases that were online accessed, then reviewed, analyzed and interpreted to form conclusions. Results: The length of use of hormonal contraception, age, parity and history of cancer were not a single risk factor but there was a connection between one factor and another as a precipitating factor for the incidence of breast cancer. Conclusion: There was no risk factor that stood alone as a single cause. Collaboration among policy makers, health workers and the community were needed to engage in further research on the other factors that could be additional risk factors and appropriate initial screening to make time and effectiveness efficient for people at high risk.

Keywords: *breast cancer, risk factors, women*

INTRODUCTION

One type of cancer with a high incidence is breast cancer, which is 38 per 100,000 women (Globocan / IARC 2012). Cancer prevalence in Indonesia is 1.4 per 1,000 population, cause of death number 7 (5.7%) in Indonesia (Balitbang.2013). The estimated incidence of breast cancer in Indonesia was 40 per 100,000 women, and cervical cancer was 17 per 100,000 women. This number increased from 2002, with a breast cancer incidence of 26 per 100,000 women and cervical cancer 16 per 100,000 women (Globocan / IARC 2012). The highest cancer prevalence in Indonesia was Yogyakarta Special Region with a percentage of 4.1%. This is higher than the national figure (Kemenkes RI.2015).

Some risk factors that can cause breast cancer are reproductive factors (early menarche, first pregnancy in old age, low parity, lactation), endocrine factors (oral contraceptives, hormone replacement therapy, age> 75 years with 75% breast density, atypical hyperplasia), dietary factors (alcohol consumption, obesity), and genetic factors (family members with breast cancer, family history of ovarian cancer) (Rasjidi in the journal of Cici Priyatin et al. 2013). Research conducted in Korea by Wonshik Han and So Young Kang (2010) found that patients aged less than 35 years, the risk of death rose 5% for each year of age decline. Whereas in the research conducted by Helena M. Verkooijen, et al. (2009) states that increasing parity reduces the risk of breast cancer in ethnic Malay premenopausal women, but not in Chinese and Indian women. This study relates to the duration of breastfeeding carried out by several different ethnic groups,

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namely the Malays, Chinese and Indians in Singapore. Family history can be a risk factor in the incidence of breast cancer. This is in line with the research of Ellen T. Chang, et al (2009), which states that family history of breast cancer is not all directly related to death. But this is a risk factor that cannot be avoided and can increase the risk of death. This review aims to determine the factors affecting the occurrence of breast cancer among women.

RESEARCH METHODS

Literature research was conducted using several steps: (1) Formulating research questions, (2) Developing a search strategy plan, (3) Assessing and filtering the data obtained, and (4) Analyzing and interpreting literature. The database used in this study are the PubMed, Science Direct and ProQuest databases. The keywords used are: breast cancer, women, risk factors, and the incidence of breast cancer. The criteria in this study were: women who suffered from breast cancer, journal publications between the 2008-2018 periods and were available in English. The literature search results were reviewed and filtered based on the desired criteria. The results of the literature screening were analyzed and interpreted.

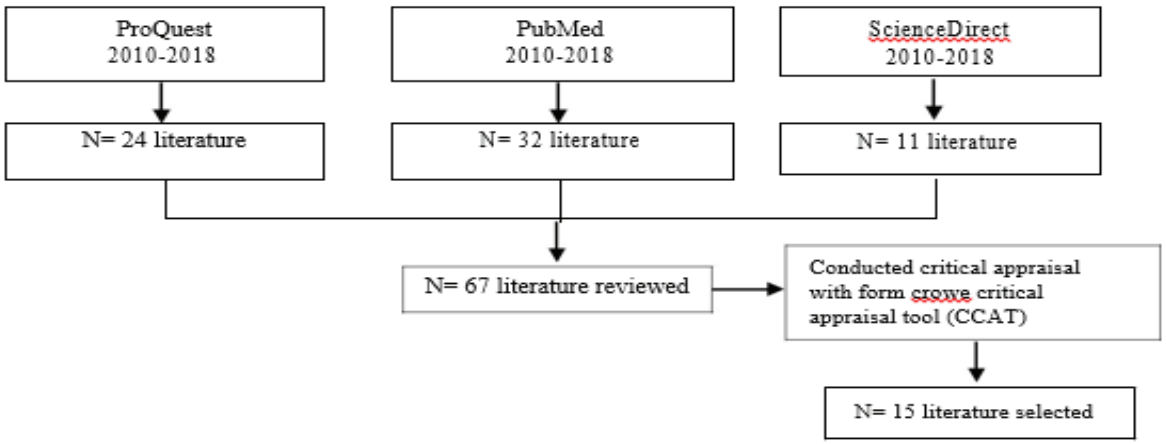

Figure 1. Screening and Literature Assessment Steps

RESULTS AND DISCUSSION

Research conducted by Mørch et al (2017) entitled "Contemporary Hormonal Contraception and the Risk of Breast Cancer". The method used in this study was a prospective cohort study with the aim to determine the relationship assessed between hormonal contraception and the risk of invasive breast cancer. In this study, it was found that among 1.8 million women who followed an average history of 10.9 years, 11,517 cases of breast cancer occurred in women who used hormonal contraception. The relative risk of breast cancer among all users of current hormonal contraception is 1.20 (95% confidence interval (CI), 1.14 to 1.26). This risk increased from 1.09 (95% (CI), 0.96 to 1.23) with less than 1 year of used to 1.38 (95% (CI) 1.26 to 1.51 with used of more than 10 year (p 0.002) After hormonal contraception discontinuation, breast cancer risk was still higher among women who had used hormonal contraception for 5 years, this estimate occurred due to combined contraceptives between 1.0 and 1.6. occurs from any hormonal contraception is 13 per 100,000 people per year, or about 1

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in 7690 women who used hormonal contraception for a year will be at risk developing breast cancer.

Huzell et al (2015) with the title "History of oral contraceptive use in breast cancer patients: impact on prognosis and endocrine treatment response". The method used prospective cohort study with the aim of studying oral contraception with the incidence of breast cancer and endocrine treatment response in a prospective population-based group. The results of this study said that 948 patients with invasive cancer and metastasis were not detected on the postoperative screen, 74% of these patients had used oral contraceptives. Patients were followed for 9 years with median 3-year follow-up and 100 recorded breast cancer events. Any use of oral contraceptives before age 20 years is associated with a threefold increased risk for the incidence of breast cancer at age <50 years but not for patients> 50 years. For patients > 50 years of age with positive tumor estrogen receptors, previous used of oral contraceptives, at any age is associated with a significantly reduced risk of breast cancer incidence among patients receiving aromatase inhibitors compared with patients who have never taken oral contraceptives (HR adjustment 0.37: 95% CI 0.15– 0.87). The use of oral contraceptives is not associated with a response to tamoxifen.

Kotsopoulos et al (2014) entitled "Timing of oral contraceptive use and risk of breast cancer in BRCA1 mutation carriers". The method applied a case control study with the aim of knowing the exact time for the use of oral contraceptives and the risk of mutase carriers of the BRCA1 gene. The results of this study were among carriers of the mutase BRCA1, users of oral contraceptives were associated significantly with an increased risk of breast cancer for women who started taking pills before age 20 years (OR 1.45; 95% CI 1.20 to 1.75; p 0.0001) and may be good between the ages of 20 and 25 (OR 1.45; 95% CI 0.99-1.42; p 0.06). The effect was limited to breast cancer diagnosed before age 40 years (OR 1.40; 95% CI 1.14-1.70; 0.001). The risk of early breast cancer increased by 11% with each increase in pill consumption when it started before the age of 20 years (OR 1.11; 95% CI 1.03-1.20; p 0.008). No increase was observed for women diagnosed at or after age 40 years (OR 0.97; 95% CI 0.79-1.20; p. 81). The use of oral contraceptives before age 25 increases the risk of breast cancer in women with BRCA1 mutase and increases with duration of use.

Research by Beaber et al (2014) with the title "Oral contraceptives and breast cancer risk overall and by molecular subtype among young women". The method used in this study is a population-based case control study with the aim to determine the risk of using oral contraceptives to the incidence of breast cancer and the risks associated with the preparation of contemporary oral contraceptive used and characterization of olecular subtypes among young women. The results were obtained that the duration of oral contraceptive use for> 15 years was associated with increased breast cancer (OR 1.5; 95% CI 1.1-2.2). Current use of oral contraceptives (within 1 year from date of use) for >5 years is associated with an increased risk (OR 1.6; 95% CI 1.1-2.5) and there is no statistically significant difference in risk with preparation oral contraception. The greater risk is generally among women aged 20-39 years, and for negative receptor breast cancer and triple negative breast cancer (use for 25 years from the study conducted, between the ages of 20-39 years ER- OR 3.5; 95% CI 1.3-9.0; triple negative OR 3.7; 95% CI 1.2 to 11.8), although differences between groups were not statistically significant.

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Research from de Glas et al (2015) with the title "Contralateral breast cancer risk in relation to tumor morphology and age-in which patients is preoperative MRI justified?". The method in this study was a population-based cohort study with the aim of assessing the age and tumor morphology associated with the incidence of cotralateral breast cancer. The results said that multivariable analyzes performed, lobular tumors were associated significantly with an increased risk of contralateral breast cancer within 6 months (cumulative incidence 1.9% hazard ratio sub distribution (SHR) 1.17; 95% CI 1.06-1,30 compared to 1.3% in ductal tumors p 0.002). Age is also associated with an increased risk of contralateral breast cancer in 6 months (SHR 2.34; 95% CI 2.08-2.62; p 0.002 for patients over 75 years compared to patients younger than 50 years). The risk of contralateral breast cancer in 6 months is only slightly increased in patients with lobular tumors and older patients.Research conducted by Sibio et al (2016) with the title "Female breast cancer in Central and South America". This study used population-based data on regional and national levels. The aim is to describe and review the status of control of breast cancer in women in Central and South America. The results of this study are that in the last 5 years, Argentina, Brazil and Uruguay had the highest incidence rates (67.7-71.9) and Bolivia and El Salvador had the lowest rates (7.9-12.7). For most countries, the mortality rate were ≤12.3, except in Uruguay, Argentina and Cuba (14.9-20.5). Specific age levels increased after age 40-50 years and reach a maximum after age 65 years (mean age at diagnosis 56-62 years). Geographical variation observed at the level of breast cancer can be explained by differences in registration practices and lack of certainty and changes in the prevalence of factors known to increase the risk of this disease, such as early menarche, advanced age in first pregnancy, low number of pregnancies, short or no period while breastfeeding, menopause, estrogen-progestogen oral contraceptives or the use of HRT, obesity (for only postmenopausal breast cancer), alcohol consumption, and physical inactivity.

Sighoko et al (2018) with the title "Disparity in breast cancer mortality by age and geography in 10 racially diverse US cities. The method used was a cohort with the aim to study the comparison of mortality disparities by age group between 10 cities with the largest African American population and the US. The difference in NHW breast cancer mortality in all age groups with the largest differences observed among women less than 40 years old and aged 40-49 years and the smallest among women aged 50-64 years and 65+. All 10 cities show the same trend. However, the direction and magnitude of the difference are not only by age groups, but by geographical location. Some cities had fewer racial disparities in breast cancer disparity than other cities in all age groups. For example, Eastern US cities such as New York, Philadelphia, Washington and Baltimore show no or decrease the rate of disparity in breast cancer deaths among women 65+ compared to the US or other cities. Finally, nearly two-thirds of excess deaths are observed among women under the age of <50. In the age group <40, RR ranged from 1.71 in Houston to 5.37 in Washington, DC. For the 50–64 age group, the difference is less pronounced, ranging from 1.24 in New York to 1.72 in Chicago. For the 65+ age group, breast cancer mortality disparity extends from city to city. Three cities with higher mortality for NHW compared to NHB; Baltimore 0.78, Washington DC 0.94 and New York 0.98. One city is not statistically significant racial variation in breast cancer mortality in this age group and six cities have increased.

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Research by Li et al (2016) entitled "BMI, reproductive factors, and breast cancer molecular subtypes: A case-control study and meta-analysis". This study used case-control study based on population with the aim to determine the risk of the body index period, reproductive factors associated with the subtype of molecular breast cancer. The results of this study were late menarche not associated with luminal tumors (P trend 0.03). Higher BMI was associated with the risk of luminal tumors and triple negative tumors (P trend <0.001). The final age at live birth was associated with an increased risk of 2.08-fold in all subtypes, while late menopause increased the risk by 2.62 to 5.56 times. The difference in this relationship was not detected for different menopausal status. In the meta-analysis, it was revealed that the relationship of positive dose response between body mass index and risk to luminal and ER-PR-subtype (P trend <0.05). Early menarche and nulliparity increase the risk of luminal tumors by 1.39 and 1.26 times. And not breastfeeding also increases the risk for all subtypes.

Research from Park et al (2017) entitled "Reproductive factors as risk modifiers of breast cancer in BRCA mutation carriers and high-risk non-carriers". The aim of this study was to identify the role of reproductive factors as environmental modifiers for the risk of clinic-based breast cancer. The results of this study were that the earlier age of menarche increased the risk of breast cancer by 3.49 times in BRCA2 mutase carriers (95% CI 0.3-6.00) and 3.30 fold in family history that did not have carrier characteristics (95% CI 1.73-6.34). But in BRCA 1 carriers and not carriers at early breast cancer onset are not significant (P heterogeneity 0.047). Higher parity reduces the risk of breast cancer in BRCA carriers and is not carriers of family history, especially in BRCA1 carriers (HR 0.27; 95% CI 0.09-0.83 for two parities 0.23; 95% CI 0.05 -1.00 for> 3 parity), but increased risk of early breast cancer onset (HR 3.99; 95% CI 1.65-9.67; HR 7.69; 95% CI 1.96-25.01; while oral contraceptive use was not associated with breast cancer risk in other groups and longer exposure to estrogen had a lower risk for breast cancer (P heterogeneity <0.001).

This study conducted by Yaghjyan et al (2016) with the title "Reproductive factors related to childbearing and mammographic breast density". The method used a cohort study with the aim of investigating the relationship of reproductive factors associated with childbirth with percent breast density, solid areas and not limited to absolute, with menopausal status. This study involved 4110 cancer-free women in the Nurse Health Study and Health Research II cohort of nurses. The result when compared to nulliparous women, parous postmenopausal women have a lower percent density (b = -0.60, 95% CI -0.84; -0.37), a smaller absolute solid area (b = -0, 66, 95% CI -1.03; -0.29), and a larger non-dense area (b = 0.72, 95% CI 0.27; 1.16). Among parous women, the number of children was inversely proportional to the percent density in pre-(b per one child = -0.12, 95% CI -0.20; -0.05) and postmenopausal women (b per one child = -0.07, 95% CI -0.12, -0.02). A positive association with breastfeeding with an absolute density breast and a non-dense area is limited to premenopausal women, whereas a positive age relationship at first childbirth with percent density and inverse relationship with a non-dense area are limited to postmenopausal women. Women with a larger number of children and a younger age at the birth of the first child have a better pattern of breast density that can explain the subsequent reduction in the risk of breast cancer.

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Research conducted by Anderson et al (2017) with the title "Associations of parity-related reproductive histories with ER6 and HER26 receptor-specific breast cancer etiology". The aim of this study was to assess the parity relationship, number of live births and age at first birth (AFLB) with the risk of specific receptors. The results of this study were nearly 31 million women per year following up, 45,786 Danish women aged 20–84 years developed invasive breast cancer during 1992– 2011. ER ± expression was available for the entire study period and HER ± after 2006. Of breast cancer with known ER expression, 79% were ER +. Most known breast cancers with ER and HER2 are HER2 - (90% of ER + and cancers and 65% of ER cancers). RRs differ from ER ± expression for all reproductive variables (p-homogeneity <0.001). The association is stronger for ER + than ER - cancer and for those diagnosed before age 50. Parity and baseline [not after] AFLB show protective relationship with ER + / HER2 - and the risk relationship with ER- / HER2 - cancer.

Research by Maskarinec et al (2017) with the title "Tumor characteristics and family history in mammographic density relations and breast cancer: The French E3N cohort". The method used a cohort study that aims to determine tumor characteristics and family history in relation to breast density and breast cancer. The results of this study state that overall, OR per 1 SD for percent density mammography (PMD) was 1.50 (95% CI, 1.33-1.69). There is no evidence for significant heterogeneity by tumor size, lymph node status, levels, and hormone receptor status (estrogen, progesterone, and HER2) detected. However, the PMD relationship was stronger for women who reported a family history of breast cancer (OR1SD = 2.25; 95% CI, 1.67-3.04) compared to women who did not report (OR1SD = 1.41; 95% CI, 1,24–1.60; p heterogeneity = 0,002). Similarly, modification of effects by family history of breast cancer was observed using the PMD category (p heterogeneity = 0.02) with an OR of 15.16 (95% CI, 4.23-54.28) vs. 3.14 (95% CI, 1.89–5.22) for ≥ 50% vs. <10% PMD.

This study conducted by Zhou et al (2014) with the title "Risk of breast cancer and family history of other cancers in first-degree relatives in Chinese women: a case control study". This study used a case control study method with the aim to determine the relationship between breast cancer risk and other family history of cancer in first-degree relatives. The result are a family history of esophageal cancer (OR: 2.70, 95% CI: 1.11 - 6.57), lung cancer (OR: 2. 49 95% CI: 1.10 - 5.65), cancer system digestion (OR: 1.79, 95% CI: 1.14 - 2.79) and any cancer (OR: 2.13, 95% CI: 1.49 - 3.04) in first-degree relatives was directly associated with an increased risk of breast cancer. In the subgroup analysis, the risk of breast cancer receptor hormone was positively increased in subjects with a family history of lung cancer (OR: 3.37, 95% CI: 1.45 - 7.82), while the risk of negative hormone receptor breast cancer increased in subjects with a history family of esophageal cancer (OR: 6.19, 95% CI: 2.30 - 16.71), uterine cancer (OR: 6.92, 95% CI: 1.12 - 42.89), digestive cancer tract (OR: 2.05, 95% CI: 1.03 - 4.10) and gynecological cancer (OR: 6.79, 95% CI: 1.46 - 31.65). In addition, a significant increase in breast cancer was observed with a family history of digestive system cancer for subjects aged 50 years and younger (OR: 1.88.95% CI: 1.03 - 3.43), not for older subjects. 50 years (OR: 1.67, 95% CI: 0.86 - 3.25).

Research from Kharazmi et al (2014) entitled "Effect of multiplicity, laterality, and age at onset of breast cancer on familial risk of breast cancer: a nationwide prospective cohort study". The study used a cohort study method. The results of this

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study are the highest risk of family breast cancer seen in young subjects (aged <50) who have at least one FDR with a diagnosis of multilateral (about ten-fold) or contralateral breast cancer (5.5-fold) at an early age (<40) Family risk of breast cancer in all families decreased with increasing age at risk and FDR at diagnosis of first breast cancer, but still increased significantly for older subjects (≥60 years) who have FDR affected by contralateral breast cancer (HR = 2 , 2) in the elderly (≥80) compared with subjects without an elderly family history of breast cancer.

The research by Menes et al (2015) with the title "Second primary breast cancer in BRCA1 and BRCA2 mutation carriers: 10-year cumulative incidence in the Breast Cancer Family Registry". Research used family registration studies with the aim of looking at the risk of breast cancer in BRCA1 and BRCA2. The results of this study mention the 10-year incidence of the second highest primary breast cancer in BRCA1 mutation carriers (17%; 95% CI 11-25%), with a higher estimate for those who were first diagnosed under 40 years of age (21%; 95% CI 13-34%). Lower rates were found in carriers of BRCA2 mutations (7%; 95% CI 3-15%) and women with unknown clinical significance variants (6%; 95% CI 4-9%).

Based on research submitted by Mørch et al (2017) and Huzell et al (2015) which states that the used of hormonal contraception, especially oral contraceptives increased the risk of breast cancer, especially if the contraceptive used period is > 5 years. According to Kotsopoulos et al (2014) an increased in the incidence of oral contraceptives also occurs in the age range <20-25 years. While the type of hormonal contraception that contributes to high numbers according to Beaber et al (2014) is a type of hormonal contraception containing estrogen. This finding is in line with the theory presented by Pamungkas Zavier (2011) that women who used oral contraceptives (birth control pills) have a slightly higher risk of developing breast cancer. But this risk can decreased again after the use of the pill is stopped. In addition to birth control pills, other hormonal contraceptives such as injectable birth control given every 3 months are also known to have an effect on breast cancer risk, but will decreased if the use of this type of contraception is stopped for more than 5 years. In the study conducted by de Glas et al (2015), Sibio et al (2016) and Sighoko et al (2018) stated that age is one of the contributors to high risk of breast cancer. The risk of breast cancer in the three studies increased strongly at the age of> 40 years, while at the age of <40 years and> 70 years had a low risk of the incidence of breast cancer. These findings are in line with research conducted by Sumitra Shantakumar et al (2007) which says age plays an important role in the incidence of breast cancer. Age is associated with the first time menarche, childbirth and breastfeeding and age at menopause which can affect the ovulation cycle experienced by women. Research conducted by Maskarinec et al (2017), Zhou et al (2014), Kharazmi et al (2014) and Menes et al (2015) obtained results that are a history of cancer in the family can increase the risk of breast cancer in women. This increased are due to several things, including the level of breast density and the presence of gene mutations from the family. This finding was supported by Amanda I. Phipps, et al (2010) said that this increased risk was as large as triple-negative breast cancer subtypes ER, ER- / PR- / HER2. Data showed1.56 - 1.73 fold increased breast cancer risk in women with a first family history and specifically 1.47-1.63 fold increased risk of breast cancer in women with one (or more than one) affected,

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and an increased risk of 2.05-2.66 times folding in women with at least two affected families, compared to women without a family history.

The journals were limited to English-language journals, the databases used are only 3 databases. Strength in this studies were that all selected articles had passed feasibility studies. In the selected articles, it was possible to find out the factors that influence the incidence of breast cancer, so this article could provide information and could help policymakers taking important steps towards the prevention of breast cancer. The search for this article was carried out in various countries so that it was possible to be generalized in all places with the same population.

CONCLUSION

The results found that all four factors (length of use of hormonal contraception, age, parity and history of cancer in the family) proved to be a risk factor for breast cancer. However, this was not a single factor, at least two other factors were needed to determine this factor to be a risk factor for the incidence of breast cancer. As the findings were the age factors associated with oral contraceptive use. Good collaboration between policy makers, health workers and the community is needed to engage in further research on other factors that can be additional risk factors and appropriate initial screening to make time and effectiveness effective for high-risk people, so they can take immediate precautions.

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