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Relationship Between History of Hormonal Contraception with Hormonal Receptor's Expression on Breast Cancer Patients in Mohammad Hoesin General Hospital Palembang

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Abstract

Background: Cancers with esterogen receptor negative (ER-) have a worse prognostic than estrogen receptor positive (ER +). Research by Cooper at al and Huiyan Ma et al have found strong association between history of hormonal contraceptive use and breast cancer with receptor negative estrogen (ER -). However, another study from Cotterchio et al found no difference.

Methods: This study investigated breast cancer patients who went to dr. Moh Hoesin Palembang. This study involved 200 respondents with data obtained using patient immunohistochemical data and interviews using a questionnaire. This study uses a cross sectional analysis method. Data were obtained from the history of use of hormonal contraception, the type of hormonal contraception, and the status of hormonal receptors (Esterogen Receptors (ER) and Progesterone receptors (PR). 2x2 tables were used to obtain the Prevalence Ratio (PRR) and chi quare to obtain p values.

Results: The results of the Chi square analysis showed that there was no significant relationship between the history of hormonal contraception and negative receptor expression with the prevalence ratio of hormonal contraceptives and ER (-) 1.48 times and PR (-) 1.43 times. There was no significant relationship between type of contraception and negative ER PR. The highest relative risk is in implant contraception with 1.54 times for ER (-) and 1.8 times for PR (-)

Conclusion: There was no relationship between the history of hormonal contraception and negative hormonal receptors

Keywords: hormonal contraception, hormone receptors, estrogen receptors, progesterone receptors

1. Introduction

Hormonal receptor status is known to be an important prognostic factor in patients with breast cancer.[1] Research from Cooper at al and Huiyan Ma et al have found a stronger association between hormonal contraceptive use and breast cancer with receptor negative estrogen (ER-) compared to estrogen receptor positive (ER +). [2,3] However, another study from Cotterchio et al found little or no difference[4]

A stronger association of hormonal contraceptives with receptor negative estrogen (ER-) is important because, cancer with a negative estrogen receptor (ER-) has a worse prognostic than receptor positive estrogen (ER +).[5]

This study aimed to determine the relationship between the history of hormonal contraception and the expression of estrogen and progesterone receptors.

2. Method

This study investigated breast cancer patients who went to dr. Moh Hoesin Palembang. This study involved 200 respondents with this research data obtained using secondary data in the form of immunohistochemical data obtained from patient data in the polyclinic, chemotherapy room, ward, and patient medical records. Then proceed with direct interviews using questionnaires for patients in polyclinics, chemotherapy rooms, and wards, as well as via telephone for patients whose data is obtained from medical records.

This research uses cross sectional analysis method. Distribution data were obtained in the form of age, domicile, and history of use of hormonal contraceptives, types of hormonal contraception, and status of hormonal receptors (Esterogen Receptors (ER) and Progesterone receptors (PR). Distribution data were processed using univariate analysis. Hormonal contraceptives and Hormonal Receptors were

processed using bivariate analysis. 2x2 tables were used to obtain the Prevalence Ratio (PR) and chi quare to obtain p values.

3. Results

Table 1 presents data regarding the general characteristics of the study sample. The sample with age > 40 years was more in this study, namely 151 (75.5%), while the sample aged ≤ 40 years was 49 (24.5%). The most widely used type of contraception was combination of 77 (38.5%) and injection of 45 (22.5%).

Table 1. Research Characteristics

General Characteristics	n = 200 %
Age	
≤ 40 years old	49 (24.5 %)
> 40 years old	151 (75.5 %)
Types of contraception	
Pill	33 (16.5 %)
Injection	45 (22.5 %)
Implant	12 (6 %)
Combination	77 (38.5 %)
Don't use	33 (16.5 %)
Contraceptive history	
≤ 5 years	35 (17.5 %)
> 5 years	132 (66 %)
No history	33 (16.5 %)

The most dominant histopathological picture was in Invasive Ductal Carcinoma Mammae which was 181 (90.5%). There were 142 (71.0%) samples positive for invasion lymphovascular, 150 (75%)

positive samples for estrogen receptors and 106 (53%) samples which were negative for progesterone receptors. Can be seen in Table 2

Table 2. Characteristics of Tumor Pathology

Characteristics	**n (%)**
Histopathological Features	
Invasive Ductal Ca Mamma	181 (90.5 %)
Invasive Lobular Ca Mamma	9 (4.5 %)
Etc	10 (5 %)
Histopathology Grade	
1	4 (2 %)
2	49 (24.5 %)
3	147 (73.5 %)
Lymphovascular Invasion	
Positive	142 (71.0 %)
Negative	58 (29 %)
Estrogen Receptors	
Positive	150 (75 %)
Negative	50 (25 %)
Progesterone receptors	
Positive	94 (47%)
Negative	106 (53%)

It is obtained from table 3 that out of 200 samples, patients aged <40 years with negative ER were 14 (7%) and samples> 40 years with positive ER were 36 (18%) of the sample.

Table 3. Esterogen receptors and age

Age	Esterogen Receptors		Total
	ER Negative	ER Positive	
< 40 years	14	35	49
> 40 years	36	115	151
	50	150	200

From table 4 it is known that of the 200 samples, there were 22 (11%) patients aged <40 years with negative PR and 84 (42%) samples aged> 40 years with positive PR.

Table 4. Progesterone receptors and age

Age	Progesterone Receptors		Total
	PR Negative	PR Positive	
< 40 years	22	27	49
> 40 years	84	67	151
	106	94	200

Relationship between history of hormonal contraception and hormonal receptor expression

The relationship between contraceptive history and the expression of hormonal receptors can be seen in Tables 5 and 6.In this table, patients who are included in the category of having a history of hormonal contraception are patients who have used family planning for more than 5 years, while those who do not have a history of hormonal contraception are patients who do not have a history of hormonal contraception. Have used Hormonal Contraception and used Hormonal Contraception for less than 5 years. Chi square test results showed that there was no significant relationship between contraceptive history and homonal receptor expression.

Table 5. Hormonal Contraception and Expression of Estrogen Receptors

History of Hormonal Contraceptives	Esterogen Receptors		P	95 % *(confident interval)*
	ER Negative	ER Positive		*PRR*
Yes	37 (18.5 %)	95 (42.5 %)	1.648	1.48 (0.8 - 336)
No	13 (6.5 %)	55 (27.5 %)		

ER = estrogen receptors. The p value of the chi square test was significant if p <0.05

Table 6. Hormonal Contraception and Expression of Progesterone Receptors

History of Hormonal Contraceptives	Progesterone Receptors		P	95 % *(confident interval)*
	PR Negative	PR Positive		*PRR*
Yes	74 (37 %)	58 (29 %)	0.227	1.435 (0.78 -2.58)
No	32 (16 %)	36 (18 %)		

PR = Progesterone receptor. Chi square test, p value was significant if p <0.05

If you look at negative ER who have a history of contraception, there are 37 (18.5%) samples, while those with negative PR are 74 (37%). The results of the Chi square analysis showed that there was no relationship between the history of hormonal contraception and negative receptor expression. From Tables 5 and 6, it is also found that hormonal contraception as the prevalence ratio (PRR) of negative estrogen receptors is 1.48 times and that of negative progesterone receptors is 1.43 times.

The relationship between types of hormonal contraceptives with estrogen and progesterone receptors is negative

Seen in Tables 7 and 8 regarding the relationship between types of contraception and negative receptor expression. Chi square test results did not show a significant relationship between the type of hormonal contraception and negative estrogen and progesterone receptors.

It was found that the prevalence ratio (PRR) of implant hormonal contraception with negative Esterogen hormonal receptors was 1.54 times. It was found that the prevalence ratio of implant hormonal contraceptives with negative Progesterone hormonal receptors was 1.8 times.

Table 7. Relationship between types of contraception and negative estrogen receptors

Type	Estrogen Reseptors		P	95% CI PRR (Lower-Upper)
	Negative	Positive		
Pill			0.441	1.38 (0.606-3.1)
Yes	10(5%)	23(11.5%)		
No	40(20%)	127(63.5%)		
Injection			0.379	0.69 (0.3-1.56)
Yes	9(4.5%)	36(18%)		
No	41(27%)	114(73%)		
Implant			0.492	1.54 (0.44-5.36)
Yes	4(2%)	8(4%)		
No	46(23%)	142(71%)		
Combination			0.356	1.357 (0.7-2.59)
Yes	22(11%)	55(27.5%)		
No	28(14%)	95(37.5%)		

Chi square test p value is significant if p <0.05

Table 8. Relationship between types of contraception and negative progesterone receptors

Type	Progesterone receptors		p	95% CI
	Negative	Positive		PRR (Lower-Upper)
Pill			0.338	0.8 (0.4 - 1.57)
Yes	20(10%)	13(6.5%)		
No	86(43%)	81(40.5%)		
Injection			0.530	1.2 (0.6 - 2.4)
Yes	22(11%)	23(11.5%)		
No	84(42%)	71(35.3%)		
Implant			0.328	1.8 (0.5 - 6.3)
Yes	8(4%)	4(22%)		
No	98(29%)	90(45%)		
Combination			0.524	1.2(0.68-2.134)
Yes	43(21.5%)	34(17%)		
No	63(31.5%)	60(30%)		

Chi square test p value is significant if $p < 0.05$

Relationship between history of hormonal contraception and expression of esterogen and progesterone receptors in patients with breast cancer

Hormonal receptor status is known to be an important prognostic factor in patients with breast cancer.[1] This study did not find a significant relationship between a history of hormonal contraception and the expression of estrogen receptors and progesterone receptors. This is in line with the research of Cotterchio et al, which states that there is no significant relationship between the history of hormonal contraception and the expression of hormonal receptors.[4]

This differs from research by Cooper at al and Huiyan Ma et al which states that there is an association between the use of hormonal contraceptives with breast cancer with negative estrogen receptors (ER-) compared to positive receptor estersogen (ER +).[2,3]

In this study, it was found that hormonal contraception as the Prevalence Ratio of Esterogen Receptors Negative was 1.48 times and Progesterone Receptor Negative was 1.43 times. This is not much different from Rosenbergn's 2010 study of African-American women, in which the relative risk of oral contraceptives causing an ER (-) of 1.66 times.[6]

In the study, Cooper stated that there was a Relative Risk of 1.68 times the use of oral contraceptives with ER (-) breast cancer.[1]

Specifically, in Rosenbenrg's study, the Relative Risk for oral contraceptives for 20 years or more of hormonal contraceptive use was 2.23 for breast cancer with ER (-) and 1.39 for breast cancer with ER (+).[6]

Association of hormonal contraceptives with negative esterogens and progesterone receptors.

This study found that hormonal contraception did not have a direct relationship with negative Esterogen and Progesterone receptors. However, the highest prevalence ratio was in implant contraception with 1.54 times for ER (-) and 1.8 times for PR (-). In Sweeny's study in 2007, it only stated that implant contraceptive use had an Odd Ratio of 8 times against breast cancer[7].

However, it was not stated whether implantable contraceptive use was associated with negative ER and PR In this study, the prevalence ratio of contraceptive injection was 0.37 times for ER (-) and 0.53 times for PR (-). In Sweeny's research, it was also found that the Odd Ratio of injection contraception and breast cancer was 1.23 times for breast cancer. However, Sweeny's study did not include whether injection contraceptive use was associated with negative ER and PR.[7]

From this study, it was found that the Relative Risk of Oral Contraceptives against ER and PR were negative, namely 1.38 and 0.8 times, respectively. This is in line with Sweanny's research where the odds of oral contraceptives and ER were negative 1.28 times (OR 1.28; CI 0.92-1.78) in users <5 years and 1.33 times (OR 1.33; CI 0.92-1.91) in users of oral contraceptives > 5 years. This is in line with Cooper's research, which states that Oral Contraceptives and ER (-) have a Relative Risk of 1.68 times (RR 1.68, CI 0, 84-3.35).[2]

4. Conclusion

ER negative who have a history of contraception, there were 37 (18.5%) samples, while those with negative PR were 74 (37%). The results of the Chi square analysis showed that there was no relationship between the history of hormonal contraception and negative receptor expression. There was no significant relationship between the type of contraception and negative ER PR.

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