

Immunohistochemical Study of Estrogen Receptor, Progesteron Receptor and Human Epidermal Receptor2 Expression in Breast Ductal Carcinoma among Bataknese Woman under Age 40

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Keywords: Immunohistochemical, Expression, Breast Cancer, Bataknese, Under 40.

Abstract: Breast cancer often occurs in women aged over 45 years according to data in the United States in 2003. But according to research in 2006 found data of cancer patients under 40 years to 250,000 people, indicating there has been a shift in the risk of breast cancer at a younger age. According to the Central Bureau of Statistics of North Sumatra Province 2014 population based on ethnic or tribal in Medan City, most of which is Java and followed by Batak and Tionghoa. Throughout the year 2014, most breast cancer patients in North Sumatra are Batak women. This research shows that during the period of January 1, 2017-June 2018 there were 22 cases of breast cancer in Batak women aged under 40 years, and increasing in the age group 37-40 years. In this study both ER and PR Receptor Hormonal showed the same expression that is Positive in 63.6%, while Her-2 / neu expression is Positive in 50% of cases.

1 INTRODUCTION

Breast cancer is a type of malignant neoplasm that most often occurs in women, especially women aged over 45 years. Breast cancer is rare in women under 45, but breast cancer that appears in women ages is usually more aggressive, found in advanced stages and a worse prognosis (IGCP and IBTW, 2017).

In Indonesia, breast cancer is also the most common cancer cases in women. Based on data from the International Agency on Research in Cancer (IARC), ARC incidence of breast cancer in Indonesia is 36.2 per 100,000 population and the mortality rate due to breast cancer is 18.6 per 100,000 population. (Siregar, 2013) According to the Central Bureau of Statistics of North Sumatra Province 2014 population based on ethnic or tribal in Medan City, most of which is Java and followed by Batak and Tionghoa. Throughout the year 2014, most breast cancer patients in North Sumatra are Batak women (Siregar, 2015).

The exact cause of breast cancer is unknown, but more than most neoplasms in humans, breast cancer is known to show more family involvement than any

other type of cancer. (Siregar, 2013) (Tavassoli F.A., 2002)

In routine clinical management patients with invasive breast cancer who play a role are three molecular biomarkers or hormonal receptor images namely: ER (Estrogen Receptor), PR (Progesterone Receptor), and HER-2 (Human Epidermal Receptor-2). Factors that influence the prognosis in addition to the age of the sufferer are large tumors, histology type, histology degree and involvement of the lymph nodes (Calderón-Garcidueñas *etal.*, 2012) (Gadelkarim Ahmed, 2011).

The urgency of this study is to refer to the literature that the prognosis of breast carcinoma in young women is worse than women over 45 years of age. In accordance with the above problems, and from the various studies the authors are interested to know the Immunohistochemistry Expression of ER, PR and Her-2 / neu breast cancer patients in Batak women aged under 40 years.

2 OBJECTIVE

The aim of this study is to analyze the expression of immunohistochemical marker of breast cancer which are ER, PR and Her-2/neu among Bataknese woman under age 40.

3 METHOD

This study is a retrospective study with cross sectional approach and has been approved by the Ethics Committee. The study was conducted at the Anatomic Pathology Laboratory of MurniTeguh Memorial Hospital by collecting paraffin blocks of breast cancer patients under 40 years in the period of January 2017 to June 2018. Paraffin blocks of breast cancer patients from Batak women aged under 40 years are all taken into this research sample, ie there are 42 women with breast cancer under the age of 40 years, while 22 people are Batak women.

In each case, the data were recorded for patient characteristics, clinicopathology profiles and ER, PR and Her-2 / neu immunohistochemical expressions. The tumors were typed according to the WHO classification system and graded according to the Nottingham modification of Bloom-Richardson grading scheme. The size of the tumor mass was defined by gross pathological measurements as maximum diameter (Tavassolli F.A., 2002)(Taib W.M., 2015).

Slides for immunohistochemistry were stained for ER, PR, and HER2/neu using antibodies. Positive and negative control slides were involved in each run of staining. A Positive control slides for ER and PR were prepared from breast carcinoma known to be positive for the hormone receptors studied. The hormone receptor status (ER,PR) immunohistochemical stain was scored positive cells $\geq 10.0\%$ is positive and $< 10\%$ is negative. Her2 according to immunohistochemical staining of cells can be divided into 0, 1+, 2+ and 3+. Score 0 (negative, no reactivity), 1+ (negative, faint weak reactivity in $> 10\%$ of tumor cells but only a portion of the membrane is positive), 2+ (equivocal, circumferential intense membran staining in $< 30\%$ of cells). Score 0 and 1 were considered negative, score 2 was considered weakly positive and score 3 was considered strongly positive. Only score 3 cases were considered as Her-2 overexpressing cases.

4 RESULT

The general profile of breast cancer patients in women aged under 40 years in Murni Teguh Memorial Hospital in the period January 2017-June 2018

Table 1. Characteristic profile of patients with breast carcinoma among Bataknese woman under age 40 (N=22)

Variables	N (%)	Mean	Range
Age		38	33-40
33-36	5 (22.7)		
37-40	17 (77.3)		
Surgical Methode			
Core Biopsy	12 (54.5)		
	2 (9)		
	8 (36.3)		
	13 (59)		
	9 (41)		
	NA		
	8 (36.4)		
	14 (63.6)		
	8 (36.4)		
	2 (9.1)		
	12 (54.5)		
	8 (36.4)		
	14 (63.6)		

Table 1 shows that during the period of January 1, 2017-June 2018 there were 22 cases of breast cancer in Batak women aged under 40 years, and increasing in the age group 37-40 years. This is in accordance with the literature that as age increases, the risk for breast cancer will increase (Tavassolli F.A., 2002).

From the side aspect of the breasts involved it can be seen that in this study breast involving side the most is the Left Breast (13%) (Tavassolli F.A., 2002).

Based on Grade Histology, it was found that in this research most Grade III were 63.6%. In the table above there is data that is Not Available on Lymphnode involvement as much as 54.5%, this may

be caused by small tumor size and Lymphnode whose size is also small so that lymphnode not identified. The interesting thing is also shown by table 1, that is High Tumor Infiltrating Lymphocyte found the most in this research, it can be an evidence that young age have a self defense agains malignancy.

Table 2. Immunohistochemistry Expression of Breast Carcinoma in Bataknes woman under 40 age.

IHC Expression	N	(%)
Estrogen Receptor		
Positive	14	63.6
Negative	8	36.4
Progesteron Receptor		
Positive	14	63.6
Negative	8	36.4
Her-2/Neu		
Negative	4	18.18
1(+), Negative	5	22.73
2(+), Equivocal	2	9.09
3(+), Positive	11	50
Triple Negative		
Triple Negative	2	9.09
Triple Positive		
Triple Positive	4	18.18

Based on table 2 it can be seen that in this study both ER and PR Receptor Hormonal showed the same expression that is Positive in 63.6%, while Her-2 / neu expression is Positive in 50% of cases. In this study there is a Triple Negative as an immunohistochemical expression of Batak women with breast cancer, while for Triple positive is shown by the immunohistochemical expression of breast cancer patients in this study so.

5 CONCLUSION

Breast cancer often occurs in women aged over 45 years according to data in the United States in 2003.

But according to research in 2006 found data of cancer patients under 40 years to 250,000 people, indicating there has been a shift in the risk of breast cancer at a younger age (Xing *et al.*, 2010). In this study, most Batak women who suffer from breast cancer is in the age group 34-40, with Triple Negative Immunohistochemical expression of 9.09% and

Triple Positive of 18.18%.

Further research should be made out for different clinical outcomes with improved survival.

Breast cancer in young women should be a challenge to be conquered through various means of early detection. Research on breast cancer in Batak women still requires more research with more sample quantities and also requires proof with various statistical tests, so it can show the correlation between variables for the benefit of prognosis and therapy.

ACKNOWLEDGEMENTS

This study was supported by TALENTA Program of Universitas Sumatera Utara.

REFERENCES

- Calderón-Garcidueñas, A. L. *et al.* (2012) ‘Triple Marker Immunohistochemistry Analysis in Breast Cancer Mexican Patients’, *Patologia*, 50(2), pp. 72–79.
- Taib W. M., Al-Nuaimy T.W.M., Ahmed A.H., and Al-Nuaimy H.A. Immunohistochemical Evaluation of Triple Markers (ER, PR and HER- 2/neu) in Carcinoma of the Breast in the North of Iraq. *Donnish Journal of Medical Laboratory and Diagnosis* Vol 1(1) pp. 001-009 June, 2015.
- Gadelkarim Ahmed, H. (2011) ‘Correlations of Hormone Receptors (ER and PR), Her2/neu and p53 Expression in Breast Ductal Carcinoma Among Yemeni Women’, *The Open Cancer Immunology Journal*, 4(1), pp. 1–9. doi: 10.2174/1876401001104010001.
- IGCP, W. and IBTW, Ma. (2017) ‘Hubungan Subtipe Imunohistokimia Dengan Usia Pada Pasien Kanker Payudara Di Rumah Sakit Sanglah’, *Jurnal Medika*, 6(3), pp. 2–6.
- Siregar, C. M. (2015) Pengalaman Pasien Kanker Payudara Pada Suku Batak Yang Menjalani Kemoterapi, *Idea Nursing Journal*.
- Siregar, K. B. (2013) ‘Profil ekspresi HER2 dan Ki67 pada berbagai kelompok usia penderita kanker payudara di RSUP H . Adam Malik Medan’, pp. 140–143. *Majalah Kedokteran Nusantara*, Volume 46 ,No. 3 , Desember 2013.
- Tavassolli F.A., D. P. (2002) *WHO-Pathology and Genetics of Tumours of the Breast and Female Genital.pdf*. Lyon, France.
- Xing, L. *et al.* (2010) ‘Breast Cancer: Basic and Clinical Research The Expression Patterns of ER , PR , HER2 , CK5 / 6 , EGFR , Ki-67 and AR by Immunohistochemical Analysis in Breast Cancer Cell Lines’, *Breast Cancer: Basic and Clinical Research*, 4(May 2010), pp. 35–41. doi: 10.4137/BCBCR.S0.