

**THE CROSS-SECTIONAL STUDY OF HER2/NEU RECEPTOR STATUS ASSESSMENT
IN PATIENTS OF BREAST CANCER**¹*Hafiz Muhammad Asad Shakeel, ²Muhammad Umer Ali Ayub and ³Muhammad Sohail¹Faisalabad Medical University, Faisalabad.²Akhtar Saeed Medical & Dental College, Lahore.³International Education School, Chifeng University, China.***Corresponding Author: Hafiz Muhammad Asad Shakeel**

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ABSTRACT

Objective: This research's main objective was to evaluate HER2/New receptors' condition in patients of breast cancer. **Place and Duration of study:** This research was conducted in DHQ Hospital Faisalabad's surgical department in six months, from October 2019 to March 2020. **Materials and Methods:** This study included a total of 100 outdoor patients receiving surgery. This study included female patients diagnosed with breast cancer ages 20-65. Only patients with ductal/lobular carcinoma were included. This study excluded patients with recurrence of breast cancer, and those who refused histopathology were excluded. All patients or parents received informed consent. The approval of the Ethical Committee was taken. To collect patient data, a pre-designed proforma was used. Sampling was sent to reliable HER2/Neu laboratory, tumour staging, histopathology, progesterone and estrogen. Immunohistochemical studies were performed, and Hercep was used after tissue biopsy. Three positive plus points and less than three negative ones. For data analysis, SPSS version 16 has been used. **Results:** One Hundred patients in total were selected. The average patient number was 43.88 years. HER2/New receptors were respectively positive and negative at 40% and 60%. Twenty-one percent of patients who were diagnosed with Grade 1, 35 had Grade 2, and 44 percent had Grade 3 tumour. Ductal and lobular carcinoma were 87% and 13% respectively. In 75% of patients, the estrogen receptor(ER) is positive, while 25% have negative ER receptors. Thirty-five per cent of patients reported negative progesterone (PR) receptors, while 65 per cent reported positive PR receptors. **Conclusion:** This study shows a higher incidence of HER2/New expression receptors. The highest incidence was in patients with grade 3 tumours. In most cases, PR and ER were positive, and HER2/New receptors were not related to age or obesity.

KEYWORDS: overexpression, HER2/Neu receptors, ER/PR, Breast carcinoma.**INTRODUCTION**

One of the most common cancers of invasive breast carcinoma in women is breast and breast cancer, with almost 1 million diagnosed cases annually. It is the world's most common cause of death for medieval women. Depending on different etiological factors that change the outcome of the disease, the incidence of breast cancer varies widely around the world. The rapidly growing cases of breast cancer over the years require massive preventive measures. Multiple etiological factors contribute to breast cancer growth, such as genetics, hormonal factors, and environmental factors. Increased estrogen stimulation is the reason for the high incidence of breast cancer compared to low protective levels of estrogen. Increased risk is associated with factors such as nulliparity, early menarchy and late menopause. Factors that decrease menstrual cycle frequency are protective.

One in nine women in Pakistan has breast cancer. Pakistan has an increasing incidence of approximately 50/100,000, and genetics, racial or food habits can be attributed to it. The hormone receptor status is the main parameter for the molecular classification of breast cancer that shows hormone-dependent growth. Delayed first pregnancy, nulliparity and obesity after menopause are positive for cancer related to estrogen receptor than negative cancers in the estrogen receptor. First pregnancy delays and nulliparity are heterogeneous, No association was shown for early menarches, however. HER2/New Pakistani receptors should be regularly checked for breast cancer early in Pakistan in order to detect and treat breast cancer in Pakistan. The aim of this study was to identify the links between HER2 and breast cancer and novel receptors. This study will help us quickly and swiftly diagnose breast cancer.

MATERIALS AND METHODS

A total number of one hundred patients presented in the outdoor surgery department were included in this study. This study included women diagnosed with breast cancer between 20 and 65 years of age. It included only those patients with ductal and lobular carcinoma. This study excluded patients with recurrence of breast cancer, and those who refused histopathology were others that were excluded. All patients or their relatives received informed consent. The approval of the Ethical Committee was taken. For the collection of patient data, a pre-designed proforma was used. Taking samples were sent to a reliable HER2/Neu laboratory, tumour staging, histopathology and progesterone and estrogen. Immunohistochemical studies were conducted and Hercep was used after tissue biopsy for analysis. Three plus points and fewer than three negative points were deemed positive. For data analysis, SPSS version 16 was used.

RESULTS

One Hundred patients in total were selected. The average patient number was 43.88 years. HER2/New receptors were respectively positive and negative at 40% and 60%. Twenty-one percent of patients who were diagnosed with Grade 1, 35 had Grade 2, and 44 percent had Grade 3 tumour. Ductal and lobular carcinoma were 87% and 13% respectively. In 75% of patients, the estrogen receptor (ER) is positive, while 25% have negative ER receptors. Thirty-five per cent of patients reported negative progesterone (PR) receptors, while 65 per cent reported positive PR receptors.

DISCUSSION

HER2/Neu is part of the family of protein tyrosine kinases, which are found all over the membrane. The multiple cell functions of HER2/Neu receptors such as motility, proliferation, and apoptosis prevention and overexpression can help to reduce apoptosis cell death and improve cell proliferation. In comparison with the age reported by Naem *et al.*, Favret *et al.* and Sandhu *et al.*, 42.88 is the medium age of HER2/Neu receptors. 40 percent of our HER2/Neu receptor studies. In their first study, 31 per cent of patients have over-expression of HER2/New hormone receptor, which is not linked to our study. Studies by Alahwal MS, Arigaet *et al.*, Naqvi *et al.* showed that 28.3%, 15% and 33%, respectively, of positive HER2/New Receptor, were contrary to our study. 75% of patients had a positive ER, while 25% had a negative value. PR was positive for 65% of patients and negative for 35%. 69 percent of patients had positive ER receptors and 72.3 percent had positive PR expression in a study in Bangladesh. Demographic variability and biological expression may be responsible for the difference in outcomes. 38% of patients were present in the 20-4 age group, while 62% were present in the 41-60 age group. 14 (36.84%) HER2/Neu positive patients aged 20-40 years, and 2 (41.94%) HER2/Neu positive patients aged 26 (36.84%) (41.94 per cent). Invasive ductal carcinoma, similar to other studies, was

observed in most cases. Grade 1 and Grade 2 tumors and Grade 3 tumors, respectively, were seen in 21%, 35% and 44%, but this contradicted a 55.2% grade 2 and 25.3% grade 1 tumor research in Yemen. In another comparable study in India, 44 percent of patients had tumors of grade 3. The different values in each study may be responsible for distinct etiological factors.

CONCLUSION

This study shows a higher incidence of HER2/New expression receptors. The highest incidence was in patients with grade 3 tumours. In most cases, PR and ER were positive, and HER2/New receptors were not related to age or obesity.

REFERENCES

1. Naem M, Nasir A, Aman Z, Ahmad T, Samad A. Frequency of HER-2/neu receptor positivity and its association with other features of breast cancer. *J Ayub Med Coll Abbottabad*, 2008 Sep; 20(3): 23-6.
2. Dutta V, Chopra G, Sahai K, Nema S. Hormone receptors, Her-2/neu and chromosomal aberrations in breast cancer. *Med J Armed Forces India*, 2008 Jan; 64(1): 11-5.
3. Brunnicardi FC. *Schwartz's principles of surgery*. 9th ed. USA. Mcgraw Hill, 2010.
4. Naqvi SQH, Naqvi A, Anwar M, Khan MS, Akhund AA. Significance of HER-2/neu Oncoprotein overexpression in invasive ductal breast cancer. *Ann AbbasiShaheedHosp Karachi Med Dent Coll*, 2007; 12: 79-83.
5. Sherman ME, Rimm DL, Yang XR, Chatterjee N, Brinton LA, Lissowska J, *et al.* Variation in breast cancer hormone receptor and HER2 levels by etiologic factors: a population-based analysis. *Int J Cancer*, 2007 Sep 1; 121(5): 1079-85.
6. Eliassen AH, Colditz GA, Rosner B, Willett WC, Hankinson SE. Adult weight change and risk of postmenopausal breast cancer. *JAMA*, 2006; 296: 193-201.
7. Panjwani P, Epari S, Karpate A, Shirsat H, Rajsekharan P, Basak R, *et al.* Assessment of HER-2/neu status in breast cancer using fluorescence in situ hybridization & immunohistochemistry: experience of a tertiary cancer referral centre in India. *Indian J Med Res*, 2010 Sep; 132: 287-94.
8. Payne SJ, Bowen RL, Jones JL, Wells CA. Predictive markers in breast cancer - the present. *Histopathology*, 2008; 52: 82-90.
9. Walker RA. Use and assessment of diagnostic and predictive markers in breast pathology. *Current Diagnostic Pathology*, 2007 Apr; 13(2): 126-34.
10. Nida Iqbal and Naveed Iqbal, "Human Epidermal Growth Factor Receptor 2 (HER2) in Cancers: Overexpression and Therapeutic Implications," *Molecular Biology International*, vol. 2014, Article ID 852748, 9 pages, 2014. doi:10.1155/2014/852748
11. Freudenberg JA, Wang Q, Katsumata M, Drebin J, Nagatomo I, Greene MI. The role of HER2 in early breast cancer metastasis and the origins of resistance

- to HER2-targeted therapies. *ExpMolPathol*, 2009 Aug; 87(1): 1–11.
12. Favret AM, et al: Locally advanced breast cancer: Is surgery necessary? *Breast J.*, 7: 131, 2001. [PMID:11328324]
 13. Naeem M, Nasir A, Aman Z, Ahmad T, Samad A. Frequency of HER-2/neu receptor positivity and its association with other features of breast cancer. *J Ayub Med Coll Abbottabad*, 2008 Sep; 20(3): 23–6.
 14. Sandhu DS, Sandhu S, Karwasra RK, Marwah S. Profile of breast cancer patients at a tertiary care hospital in north India. *Indian J Cancer*, 2010 Mar; 47(1): 16–22.
 15. Alahwal MS. HER-2 positivity and correlations with other histopathologic features in Breast Cancer patients–hospital based study. *J Pak Med Assoc*, 2006; 56: 65–8.
 16. Ariga R, Zarif A, Korasick J, Reddy V, Siziopikou K, Gattuso P. correlation of HER-2/neu gene amplification with other prognostic and predictive factors in female breast carcinoma. *Breast J.*, 2005; 11: 278–80.
 17. Naqvi SQH, Jamal Q, Mahmood RK, Zaidi SMH, Abbass F. Significance of HER-2/neuOncoprotein Overexpression on node positive invasive breast cancer. *J CollPhysSurg Pak*, 2002; 12: 534–7.
 18. Mostafa M, larsen M, and loveR. Estrogen Receptor, Progesterone Receptor, and Her-2/neu Oncogene Expression in Breast Cancers Among Bangladeshi Women. *J Bangladesh CollPhys Surg*, 2010; 28(3): 157–162.
 19. Favret AM, Carlson RW, Goffinet DR, Jeffrey SS, Dirbas FM, Stockdale FE. Locally advanced breast cancer: is surgery necessary? *Breast J*, 2001 Apr; 7(2): 131–7.
 20. Shet T, Agrawal A, Nadkarni M, et al (2009). Hormone receptors over the last 8 years in a cancer referral center in India: what was and what is? *Indian J Pathol Microbiol*, 52: 171-4.