EXPRESSION STATUS OF HER2/NEU RECEPTORS IN BREAST CANCER.

[1]Muhammad Faheem*, [2]Marryam Amjad, [3]Waqas Nasim
[1]RHC 153 RB Sahianwala, Faisalabad, Pakistan, Email: Faheemagri@gmail.com,
[2]DHQ Hospital Faisalabad, Pakistan, Email: Marryamamjad193@yahoo.com,
[3]DHQ Hospital Faisalabad, Email: Drwellsaid@yahoo.com.

Abstract:
Objective: Study was designed to evaluate the expression status of HER2/neu receptor in breast cancer patients.
Types of study: Cross sectional study
Location and duration of study: This study was conducted in a duration of 10 months from March 2019 to December 2019 in department of Surgery, DHQ Hospital Faisalabad.
Background: Breast cancer is one of the most common in women worldwide and one of the most common cause of death in women. Occurrence of breast cancer varies in different parts of the world due to various factors. HER2 receptor is overexpressed in breast cancer patients.
Material and Method: 150 patients were shortlisted for the study by applying various factors. Patients presented in the outdoor department of the surgery were aged between 22-60 years. Patients with ductal and lobular carcinoma were selected. Patients having the history of recurrence of disease and who rejected the histopathology were excluded from the study. Ethical committee approved the study and informed consent was taken from the patients or their attendees. Collected samples were sent to a reliable lab for HER2/Neu receptor status evaluation, tumor staging, progesterone, estrogen status and histopathological type. After that Hercep test was conducted and Minitab 16 version was used for statistical and data analysis.
Result: Mean age of the total of 150 patients was 45.66 years. Ratio of positive and negative HER2/Neu receptors was observed to be 46 % and 54% respective in patients. Ratio of the patients with different grades of the cancer were found to be 24%, 39% and 37% for grade 1 tumor, grade 2 tumor and grade 3 tumor respectively. Out of the total patients 82% were found to have ductal carcinoma and 18% were diagnosed with lobular carcinoma. 78% of the patients were found to be positive against Estrogen receptor and 22% of the total patients tested negative against estrogen receptor. Progesterone receptors tested negative in 30% and positive in 70% of the total patients.
Conclusion: Overexpression of HER2/Neu receptor was observed and most of the patients had positive estrogen and progesterone. Grade-2 patients were found to be in highest number. HER2/Neu receptor showed no association with age group and obesity.
Keywords: Breast cancer, HER2/Neu, Obesity, Ductal Carcinoma, Overexpression.

Corresponding author:
Muhammad Faheem,
RHC 153 RB Sahianwala,
Faisalabad, Pakistan,
Email: Faheemagri@gmail.com,

QR code

INTRODUCTION:

Breast cancer is one the most common types of the cancer worldwide. Further analysis of breast cancer shows that invasive breast carcinoma is the most types of cancer with around 1 million cases being diagnosed each year. Breast cancer is the responsible for the most number deaths in middle aged women around the globe. Outcome off the diseases varies depends on several etiological factors are its occurrence is high variable in different environments [1]. Increasing number of breast cancer cases demands an immense care and preventive measure to stop its occurrence. Hormonal, environmental and genetic factors are mainly responsible of causing the breast cancer. High level of estrogen in body causes the high incidence of the disease which in contrast if present in low level is protective against breast cancer. Increased frequency of the menstrual cycle like early menarche, nulliparity and delayed menopause increases the risk of the occurrence of disease and vice versa [2]. One in 9 and 500/100,000 women is suffering from breast cancer. This prevalence of diseases is linked with eating habits, genetics and racial features.

Status of hormones receptor plays an important role in growth dependent upon hormone for the molecular classification of breast cancer. Estrogen receptor-a positive is linked with the obesity after menopause, nulliparity and delayed first receptor [3]. Heterogenous linking of late 1st pregnancy is found but no such association observed against early menarche

For the early diagnosis of the breast cancer and subsequent treatment of the breast cancer in Pakistan, Human epithelial growth factor receptor HER/Neu2 should be checked and tested regularly due to high prevalence of the cancer. Aim of the present study is to investigate the link between the HER2/Neu receptors and breast cancer overexpression of this gene leads to the progression of the disease and increased resistance towards chemotherapy [4].

MATERIAL AND METHOD:

To perform the analysis total of 150 patients were shortlisted which were presented in outdoor department of surgery (OPD). Patients that were diagnosed with the diseased were of the age 22-60 years. Patients with ductal and lobular carcinoma were added in the studies. Patients showing the recurrence of the cancer were not included in the study. Histopathological analysis of all the patients were taken. After the approval committee an informed consent was signed by the patients or their attendees. Collected samples were sent to the laboratory for estrogen, progesterone level, HER2/Neu expression and tumor staging along with histopathological type analysis. Hercep test was performed for the analysis of the overexpression of HER2 protein. 3 plus score was considered as positive and rest were taken as negative. Minitab 16 was used for the statistical and data analysis.

RESULT:

Mean age of the total of 150 patients was 45.66 years. Ratio of positive and negative HER2/Neu receptors was observed to be 46 % and 54% respective in patients. Ratio of the patients with different grades of the cancer were found to be 24%, 39% and 37% for grade 1 tumor, grade 2 tumor and grade 3 tumor respectively. Out of the total patients 82% were found to have ductal carcinoma and 18% were diagnosed with lobular carcinoma. 78% of the patients were found to be positive against Estrogen receptor and 22% of the total patients tested negative against estrogen receptor. Progesterone receptors tested negative in 30% and positive in 70% of the total patients.

DISCUSSION:

Tyrosine kinase enzymes and receptors are present across the membrane and HER2/Neu is one of them [5]. It is responsible for various cellular functions like cell motility, proliferation and regulates the apoptosis [6]. Its overexpression is reportedly linked to the reduced cell apoptosis and enhanced cell proliferation [4]. Mean age of the patients was 45.66 and the same type of study was conducted by [7], [8]. Our studies showed that 46% of the patients were tested positive for HER2/Neu receptor and 605 were negative which is closely associated with the study performed by [9] where it was reported that 45.8% were tested positive. In another study reported by [8] 31% of the patients were detected with the overexpressed hormone receptor HER2/Neu. Studies conducted by [10], [11] showed the different result where 28.3% and 15% patients tested positive for HER2/Neu receptor respectively. Patients with positive ER were found to be 78% and with positive PR 70 % and in both cases negative patients were 22% and 30% respectively. Study conducted in Bangladesh was found to be little different may be due to biological expression and different demography. In that study ER positive and PR positive patients accounted for 69% and 72.3% respectively [12]

40 % patients were between the age group 20-40 years whereas 60% were of the age group 41-60 years. 30% (18) patients of the age group 20-40 year showed HER2/Neu positive while the other age group patients 37.77% (34) patients found to be positive of HER2/Neu receptor. Most common carcinoma observed in patients was invasive ductal carcinoma. Garde-1 tumor was observed in 24%, grade-2 tumor in 39% and grade-3 tumor in 37% patient. Study conducted in Yemen should different

results and with grade-1 tumor present in 25.3% patients, grade-2 tumor present in 55.2% and 44% grade-3 patients [8]. These differences exit maybe due to the different etiological factors in each study conducted in different area [1]. Similar kind of study conducted in India [13].

CONCLUSION:
PR and ER were found to be positive in majority of the cases. Obesity and age have no as such association with HER2/Neu receptor. HER2/Neu overexpression showed high prevalence rate and grade-2 cancer was most common.

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