

Frequency of Estrogen and Progesterone receptor status in Breast Cancer patients: A single institutional experience

Muhammad Khalid, Syed Ijaz Hussain Shah, Masood Javaid, Khawar Nadeem, Teyyiba Kanwal

ABSTRACT

Introduction: Breast cancer is hormone related disease and concerned hormones are Estrogen and Progesterone. Not all patients with breast cancer are positive for Estrogen receptor(ER) and Progesterone receptor (PR). Western literature shows majority of patients have positivity for ER /PR or both but our experience at Allied Hospital is different as majority of patients have negativity especially the young patients. The **objective** of this study is to determine the frequency of ER and PR status in breast cancer patients. **Material and Methods: Duration of study:** January 2010 to December 2011. **Study design:** Descriptive case series. **Place of study:** Department of Clinical Oncology Punjab Medical College /Allied Hospital Faisalabad. **Sample Size:** All breast cancer patients visited our department in two years in all age groups. **Data collection and analysis:** Data was collected and entered in specified proforma and analysed manually. **Results:** Total number of patients enrolled in this study were 866(100%) out of which

860(99.3%) were female and 6(0.7%) were male. 470 (55%) female patients were premenopausal and 390 (45%) were postmenopausal. Immunohistochemical staining was done in 396(45.7%) only others were not affording for it. ER positive, PR positive (both) were 130 (32.8%) patients and both negative were 205 (51.8%). ER positive, PR negative were 40(10.1%) and ER negative, PR positive were 21(5.3%). Among 214(54%) premenopausal patients, both positive were 70(32.7%), both negative were 116 patients (54.2%), ER +ve /PR –ve 18 (8.4%) and ER –ve /PR +ve were 10 patients (4.7%). Among 182(46%) postmenopausal patients both positive were 65(35.7%) and both negative were 93 patients (51.1%). ER +ve / PR –ve were 18 (9.9%) and ER –ve/ PR +ve were 6 (3.3%). **Conclusion:** Hormone receptor positivity is less than the negativity especially in premenopausal females. **Key Words:** Breast cancer, ER, PR

INTRODUCTION

Breast carcinoma is the most common malignancy diagnosed among women worldwide and the second leading cause of cancer mortality^{1,6}. It accounts for 22% of all female cancers, which is more than twice the prevalence of cancer in women at any other sites. In Pakistan it is more common at a young age and in advanced stage on presentation contrary to West where it is more common in old age^{1, 6}. Male breast carcinoma is a rare malignant epithelial

tumor. It is usually a disease of the elderly and accounts for less than 1% of all cancers in men and less than 1% of all diagnosed breast cancers in the world. In different Asian countries the incidence of male breast cancer is relatively high. It is more aggressive disease compared to its counterpart in females². Breast cancer is hormone related disease and concerned hormones are Estrogen and Progesterone. Not all patients with breast cancer are positive for ER and PR. Some are ER positive only, some PR positive and some are positive for both receptors. Others are negative for both. Positive hormones are associated with good prognosis^{3,5,6}. Obesity is one of the established risk factors for postmenopausal breast cancer. Obesity increases the risk of ER+/PR+ but not

Corresponding Author

Dr. Muhammad Khalid

Department of Clinical Oncology,
Punjab Medical College Faisalabad

E-mail: drkhalidonco@gmail.com

ER-/ PR- tumors. The increased risk associated with obesity can be explained by the fact that adipose tissue is the primary source of estrogens after menopause and that obesity is associated with lower levels of sex hormone-binding globulin, a protein that binds and restricts the biologic activity of Estrogens⁴.

Majority of male breast cancer is positive for ER and PR². ER+ and PR + breast cancer has low mortality and good survival than ER – and PR- patients⁵. Western literature shows majority of patients have positivity for ER and PR^{4, 5, 7} but our experience at Allied Hospital is different as majority of patients have negativity especially the premenopausal patients. Our experience is very close to the study done in Hyderabad, India. The purpose of this study is to determine the frequency of ER and PR status in breast cancer patients who visited our department during two years.

OBJECTIVE OF STUDY

To determine the frequency of Estrogen and Progesterone receptor status in Breast Cancer patients

MATERIAL AND METHODS

Inclusion criteria:

All breast cancer patients with any age and sex.

Study design:

Descriptive case series

Place of study:

Department of Clinical Oncology Punjab Medical College /Allied Hospital Faisalabad.

Sample Size:

All breast cancer patients who visited our department during two years in all age groups.

Data collection and Analysis:

Data was collected from all patients and entered in specially designed proformas. It was analysed manually and different types of percentages were calculated.

RESULTS

Total number of patients enrolled in this study were 866(100%) out of which 860(99.3%) were female and 6(0.7%) were male. Among females patients 470 (55%) were premenopausal and 390(45%) were postmenopausal. Immunohistochemical staining was done in 396(45.7%) only others were not affording for it. ER positive, PR positive (both) were 130 (32.8%) patients and both negative were 205 (51.8%). ER

positive, PR negative were 40(10.1%) and ER negative, PR positive were 21(5.3%).

Among 214(54%) premenopausal patients both positive were 70(32.7%), both negative were 116 patients (54.2%), ER +ve /PR –ve 18 (8.4%) and ER –ve /PR +ve were 10 patients (4.7%). Among 182(46%) postmenopausal patients both positive were 65(35.7%) and both negative were 93 patients (51.1%). ER +ve /PR –ve were 18 (9.9%) and ER –ve/ PR +ve were 6 (3.3%).

Table-1

Total number of patients

Total patients	Female	Male
866	860(99.3%)	6(0.7%)

Table-2

Menopausal status

Total Female	Premenopausal	Postmenopausal
860	470(55%)	390(45%)

Table-3

ER/PR status in total patients-396(underwent IHC)

ER+/PR+ (both positive)	ER+/PR-	ER-/PR+	ER-/PR- (both negative)
130(32.8%)	40(10.1%)	21(5.3%)	205(51.8%)

Table-4

ER and PR status in Pre and postmenopausal patients

Premenopausal				Postmenopausal			
214 (54%)				182(46%)			
ER+/PR+ both positive	ER+/PR-	ER-/PR+	ER-/PR- both negative	ER+/PR+ both positive	ER+/PR-	ER-/PR+	ER-/PR- both negative
70(32.7%)	18(8.4%)	10(4.7%)	116(54.2%)	65(35.7%)	18(9.9%)	6(3.3%)	93(51.1%)

DISCUSSION

Carcinoma of the breast is the commonest malignancy of females all over the world and second leading cause of death due to cancer among females after lung cancer^{1, 6}. In Pakistan it is more common at a young age and advanced stage on presentation, contrary to the West where it is more common in old age (after 60 years)^{1, 6}. All women regardless of their racial or ethnic origin or heritage are at risk of developing breast cancer¹. Approximately one in every nine Pakistani women is likely to suffer from breast cancer. This is one of the

highest incidence rates in Asia. Amazingly Pakistani women show an incidence rate of 50/100,000 and in the neighboring country India with similar socio-cultural background the incidence rate is 19/100,000¹ Male breast carcinoma is a rare malignant epithelial tumor. It is usually a disease of the elderly and accounts for less than 1% of all cancers in men and less than 1% of all diagnosed breast cancers in the world (Jamal et al., 2006). In different Asian countries the incidence of male breast cancer is relatively high. In a study of our set up, it is 3% of all breast malignancies in both sexes (Jamal et al., 1994, 2006). There is a general impression that it is a more aggressive disease compared to its counterpart in females (Ravandi-Kashaniet al., 1998). It has poor survival due to diagnostic delays and older age of the patients at the time of presentation, and due to the proximity of male breast cancer to the chest wall, with shorter lymphatic's allowing rapid dissemination of tumour².

According to a study done in Nepal early grades are more positive for ER and PR receptors than advanced grades³. Several molecular subtypes based on gene-expression patterns in breast tumor tissue have been proposed and these subtypes have distinct clinical outcomes⁴. The average ages at diagnosis were similar in the 3 major hormone receptor groups ER+/PR+, ER+/PR- and ER-/PR-, but the average age at diagnosis was younger in ER-/PR+ cases. ER/PR status varied significantly by tumor stage. Tumors in cases with advanced disease were more often ER-/PR- than those in cases with localized disease (24% vs. 17%).

Late age at menarche was significantly associated with reduced risk of ER+/PR+ tumors compared with women with an early age at menarche (age 12 years), there was an 18% reduction in risk of ER+/PR+ tumors for women who experienced menarche at age 15 years. It appeared that later age at menarche also lowered the risk of ER+/PR- tumors, but the trend did not reach statistical significance.

Among parous women, late age at first birth was associated with a higher risk of ER+/PR+ tumors. Women who had their first child at ages 26–30 years and >30 years had 40% and 52% higher risks of

ER+/PR+ tumors, respectively, than women who had their first child before age 21 years. Late age at first birth was also associated with an increased risk of ER+/PR- tumors especially among women who had their first child after age of 30⁴.

Prospective data on ethnic differences in hormone receptor-defined subtypes of breast cancer and their risk factor profiles are scarce. The authors examined the joint distributions of estrogen receptor (ER) and progesterone receptor (PR) status across 5 ethnic groups and the associations of established risk factors with ER/PR status in the Multiethnic Cohort Study (Hawaii and Los Angeles, California). During an average of 10.4 years of follow-up of 2,543 breast cancer cases with data on ER/PR status were identified: 1,672 ER positive /PR positive, 303 ER+/PR negative (PR-), 77 ER-/PR+ and 491 ER-/PR-. ER/PR status varied significantly across racial/ethnic groups even within the same tumor stage⁴.

Estrogen receptor (ER) and progesterone receptor (PR) status are biologic markers commonly evaluated in breast cancer to predict a patient's response to endocrine therapy and its prognosis^{5, 6}. Women diagnosed with estrogen receptor positive (ER+)/progesterone receptor positive (PR+) tumors are more responsive to hormonal treatment and have a better prognosis and good survival and less mortality than those diagnosed with estrogen receptor negative (ER-)/progesterone receptor negative (PR-) tumors^{5,6}.

In our set up majority of breast cancer is negative in ER and PR especially in young female patients which is contrary to western population. Our cancer patient is poor and about half of breast cancer patients were nonaffording for ER and PR testing.

According to NSABP P-1 study there is 49 % reduction in incidence of invasive breast cancer in high risk subjects who took Tamoxifen⁶. we compared the results of western and our study, ER and PR positivity in more in western breast cancer⁷ and less in our setup.

CONCLUSION

Majority of breast cancer patients were negative for ER and PR at our center.

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AUTHORS

- **Dr. Muhammad Khalid**
Department of Clinical Oncology,
Punjab Medical College Faisalabad
- **Prof. Dr. Syed Ijaz Hussain Shah**
Professor of Oncology
Department of Clinical Oncology
Punjab Medical College Faisalabad
- **Dr. Masood Javid**
Department of Medicine
Punjab Medical College Faisalabad
- **Dr. Khawar Nadeem**
Department of Clinical Oncology
Punjab Medical College Faisalabad
- **Teyyiba Kanwal**
Department of Clinical Oncology
Punjab Medical College Faisalabad

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