

Original Research Article

Evaluation of neo adjuvant chemotherapy response in patients with locally advanced breast cancer

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ABSTRACT

Background: Carcinoma of the breast from the very beginning has been a feared disease. Advanced disease is treated by neoadjuvant chemotherapy (NACT). With this, a study was conducted to evaluate the pathologic response to NACT in locally advanced breast cancer.

Methods: Study was conducted in GSL Medical College, approved by institutional ethics committee, females aged >18 years with locally advanced breast cancer were included in the study. Female <18 years and breast cancer male were not considered. The dimensions are marked and size of the lump compared before and after NACT. Chi-square test was used to find out the significance of study parameters; $p < 0.05$ was considered statistically significant.

Results: Total 110 patients were included in the study, mean age was 50.63 ± 10.76 years and 53% were in premenopausal women. When pathological response was considered, 12.7% had complete response, 66.4% had partial response and 20.9% had no response to NACT; statistically there was significant difference between pre and post treatment tumor sizes ($p < 0.05$).

Conclusions: Most of the individuals belonged to premenopausal group. Tumour size showed significant decrease after NACT. The overall response rate (complete and partial) after NACT was significant in our study group.

Keywords: Breast, Cancer, Chemotherapy

INTRODUCTION

Carcinoma of the breast from the very beginning has been a feared disease. Till today, there is an aura of fear that surrounds the mention of this name 'breast cancer'. Medical research had given a number of modalities of treatment of breast cancer, which were incomplete and have to be supplemented by another.

Although the effectiveness of therapy can be assessed according to clinical, radiological, or pathological response, the period of disease-free survival or the overall survival. The pathological complete response (PCR) is

the most effective predictive parameter for survival.^{1,2} The PCR is considered when there is complete eradication of locoregional disease.

Even in countries where breast screening is established, substantial numbers of women are diagnosed with cancers greater than 2 cm in size or locally advanced disease and had many such patients be best treated by neoadjuvant endocrine therapy or neoadjuvant chemotherapy (NACT) before surgery. With this, a study was conducted to evaluate the pathologic response to NACT in locally advanced breast cancer.

METHODS

Study setting: The study was done at GSL Medical College, Rajahmundry.

Study design: This was a prospective study.

Study period: The study was done during the period from November 2014 to April 2016.

Inclusion criteria: Females aged >18 years with locally advanced breast cancer were included in the study.

Exclusion criteria: Females aged <18 years, male breast cancer patients were excluded.

Sample size: All the female patients with locally advanced breast cancer during the study period were considered.

Study variables: They were enquired about their age, family history of carcinoma breast.

Study tools

A pre tested and pre designed schedule of questions was used to collect the data from the subjects. All patients admitted with breast cancer underwent detailed assessment. Clinical staging was done using tumour, node and metastasis staging. Those patients under locally advanced breast carcinoma are considered for study and received NACT.

Confirmation of diagnosis was done by ER/PR/HER2neu status ascertained at that time/biopsy of breast lump. Accurate measurement of breast lump was done in each patient. The dimensions are marked and size of the lump compared before and after NACT.

Size, number and fixity of affected lymph nodes are recorded before and after chemotherapy. Each patient received four cycles of chemotherapy consisting of cyclophosphamide and anthracycline (AC regimen) doses were calculated according to body surface area, with three weeks interval between each cycle. Patient were evaluated before each cycle of chemotherapy for any progression and finally after completion of 4 cycles of anthracycline regimen before surgery. Pathological response was ascertained after MRM from histopathological examination.

Data was analysed by using SPSS version 21. Chi-square test was used to find out the significance of study parameters on categorical scale between two groups; p<0.05 was considered statistically significant.

RESULTS

Total 110 patients were included in the study, mean age was 50.63±10.76 years and ranged between 25 to 72

years. In this study, 2 patients (1.8%) were in 21-30 years age group, 21 patients (19.1%) were in 31-40 years age group, 35 patients (31.8%) in 41-50 years age group, 28 patients (25.5%) in 51-60 years age group, 21 patients (19.1%) in 61-70 years age group and 3 patients (2.7%) were in >70 years of age; most of the study groups are below 50 years (Table 1).

Table 1: Age wise distribution of study participants.

Age (in years)	Frequency	%
21-30	2	1.8
31-40	21	19.1
41-50	35	31.8
51-60	28	25.5
61-70	21	19.1
>70	3	2.7
Total	110	100.0

Among the study participants, 53% (58) were pre-menopausal women and 47% (52) were post-menopausal women (Table 2). In this study, 14 patients (12.7%) had complete pathological response, 73 patients (66.4%) had partial response and 23 patients (20.9%) had no response to NACT (Table 3).

Table 2: Menopausal status of the study participants.

Menopausal status	Frequency	%
Post-menopausal	52	47.27
Pre-menopausal	58	52.72
Total	110	100.0

Table 3: Response distribution of the study participants.

Response	Frequency	%
Complete	14	12.7
Partial	73	66.4
No response	23	20.9
Total	110	100.0

The mean tumour size before treatment was 7.29±2.19 cm and after NACT the mean tumour size was 4.09±2.60 cm. Statistically there was significant difference between pre and post treatment tumor sizes (p<0.05) (Table 4).

Table 4: Tumor size in cm before and after treatment among the study participants.

Parameter	Before treatment	After treatment	P value
Tumor size	7.29±2.19	4.09±2.60	<0.001

DISCUSSION

In the present study, the mean age was 50.63±10.76 years similar to that of Ali et al, reported 50.4±10.4 years.³

However, Onitillo et al reported 62.7 ± 13.8 years.⁴ Up to the age of 40 years, the increase rate of breast cancer is very steep; the rate of increase then slows dramatically, although the overall cancer rate continues to rise until old age. The cumulative risk of developing breast cancer between ages of 20 to 40 was 0.5% and it is 5% between 50 to 70 years.^{5,6} Among the women the breast cancer risk appears is greatest if diagnosed before the age of 40.⁷

As per Miglietta et al report, 38% were premenopausal and 62% were postmenopausal women; whereas it was 59% and 41% respectively pre and postmenopausal women as per Burcome et al study.^{8,9} In the present study, 53% participants were premenopausal and 47% postmenopausal women. Invasive ductal carcinoma is the most common presentation of breast cancer, accounting for 50 to 70% of invasive breast cancers, usually present in premenopausal or postmenopausal women in the fifth to sixth decades of life as a solitary, firm mass.¹⁰ Tubular carcinoma is usually recognized in perimenopausal or early menopausal periods. Distant metastases are rare in tubular carcinoma, 100% long term survival approaches. Invasive cribriform carcinoma is a closely related variant of tubular carcinoma, both tubular and cribriform carcinoma give rise to axillary metastases confined to level I group.¹¹

In present study 12.7% showed PCR, 66.4% showed partial response and 20.9% had stable/progressive disease to NACT. Dondiya et al study showed complete pathological response in 17%, partial response in 61% and stable disease in 21% of patients.¹² Earlier studies conducted in India reported, 18.9% complete PCR response for docetaxel chemotherapy and 13.2% showed complete pathological response for AC chemotherapy.¹³

In present study the mean tumour size was 7.29 ± 2.19 cm, 4.09 ± 2.6 cm respectively before and after NACT, showed significant reduction in tumour size with NACT ($p < 0.0001$). As per Ali et al, report, mean tumor size before NACT was 7.4 ± 2.6 cm and after NACT was 3.6 ± 1.6 cm which was also significant reduction in tumor size ($p < 0.001$).³

CONCLUSION

Most of the individuals belonged to premenopausal group. Tumour size showed significant decrease after NACT. The overall response rate (complete and partial) after NACT was significant in our study group.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Iqbal J, Kausar B, Saeed Akram M, Zeba A. Survival of women with locally advanced breast cancer at a teaching hospital Lahore. J Pak Med Assoc. 2010;60:721-5.
2. Buzdar AU. Preoperative chemotherapy treatment of breast cancer. A review cancer. 2007;110:2394-407.
3. Ali EM, Ahmed RH, Ali AM. Correlation of breast cancer subtypes based on ER, PR and Her2 expression with axillary lymph node status. Cancer Oncol Res. 2014;2(4):51-7.
4. Onitillo AA, Engel JM, Greenlee RT, Muckesh BN. Breast cancer subtypes based on ER/PR and HER2 expression comparison of clinico pathologic features and survival. Clin Med Res. 2009;7:4-13.
5. Hulka BS. Epidemiologic analysis of breast and gynecologic cancers. Prog Clin Biol Res. 1997;396:17.
6. Singletary SE. Rating the risk factors for breast cancer. Ann Surg. 2003;237:474.
7. Norton JA, Bollinger R, Chang A, Lowry S, Mulvihill SJ, Pass HI, et al. Surgery Basic sciences and Clinical Evidence. Springer; 2001: 1607-1610.
8. Miglietta. ER, PR, Her2 grading and ki67 before and after neoadjuvant for locally advanced breast cancer. Anticancer Res. 2009;29:1621-6.
9. Burcombe RJ, Makris A, Richman PI. Evaluation of ER, PR, Her2 and ki-67 as predictors of response to neoadjuvant anthracycline chemotherapy for operable breast cancer. Br J Cancer. 2005;92:147-55.
10. Singletary SE, Allred C, Bassett LW, et al, Staging system for breast cancer: revisions for the 6th edition of the AJCC Cancer Staging Manual. Surg Clin N Am. 2003;83:803-19.
11. Das S. A manual on clinical surgery. 4th ed. Volume 30. Calcutta: 1996: 308-322.
12. Dondiya HG, Brahmabhatt AP. Neoadjuvant chemotherapy in patients with locally advanced breast cancer. J Cancer Res Therapeutic. 2015;11(3):183-8.
13. Raina GD, Rath GK, Shukla NK, Mohanti BK, Sharma DW. Clinical and pathological response rates of docetaxel based neoadjuvant chemotherapy in locally advanced breast cancer and comparison with anthracycline based chemotherapy. Indian J Cancer. 2011;48:410-4.

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