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.

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>31-40</td>
<td>21</td>
<td>19.1</td>
</tr>
<tr>
<td>41-50</td>
<td>35</td>
<td>31.8</td>
</tr>
<tr>
<td>51-60</td>
<td>28</td>
<td>25.5</td>
</tr>
<tr>
<td>61-70</td>
<td>21</td>
<td>19.1</td>
</tr>
<tr>
<td>&gt;70</td>
<td>3</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100.0</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Menopausal status</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-menopausal</td>
<td>52</td>
<td>47.27</td>
</tr>
<tr>
<td>Pre-menopausal</td>
<td>58</td>
<td>52.72</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3: Response distribution of the study participants.

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>14</td>
<td>12.7</td>
</tr>
<tr>
<td>Partial</td>
<td>73</td>
<td>66.4</td>
</tr>
<tr>
<td>No response</td>
<td>23</td>
<td>20.9</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100.0</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Before treatment</th>
<th>After treatment</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor size</td>
<td>7.29±2.19</td>
<td>4.09±2.60</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

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. Up to the age of 40 years, the incidence 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. Among the women the breast cancer risk appears is greatest if diagnosed before the age of 40.

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 Burcombe et al study. 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. 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.

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. Earlier studies conducted in India reported, 18.9% complete PCR response for docetaxel chemotherapy and 13.2% showed complete pathological response for AC chemotherapy.

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).

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**
