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# A Comparative Study on Outcomes of Adjuvant and Neoadjuvant Chemotherapy on Locally Advanced Breast Cancer.

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## ABSTRACT

**Background:** Breast cancer is among the leading cause of cancer related deaths in women. The treatment of locally advanced breast cancer requires a combination of systemic chemotherapy, surgery, and radiotherapy to optimize the chance of cure. The aim of present study is to compare the effect of Adjuvant Chemotherapy and Neo-adjuvant Chemotherapy on Locally Advanced Breast cancer (LABC). **Methods:** The study included 35 female patients presenting to the surgery OPD of SVBP hospital with locally advanced breast cancer proven on biopsy out of which 17 patients received Neoadjuvant chemotherapy based on high tumour breast ratio, fixed lymph nodes in the axilla, fixed to the chest wall and multiple sattelite lesions. And 18 patients were operated as modified radical mastectomy and then they received the six cycle of adjuvant chemotherapy. The data collected was statistically analysed by WILKOXONS SIGNED RANK TEST for neoadjuvant chemotherapy and percentage evaluation for results of adjuvant chemotherapy. **Results:** Clinically measured size of tumour correlates well with the radiological assessment of the same. There was significant reduction of tumour size both clinically and radiologically. There was significant reduction of tumour size both clinically and radiologically in ER/PR+ve as well as ER/PR-ve patients but more decrease in ER/PR+ve patients means receptor positivity is a good prognostic sign. 88.9% of patients who have receive adjuvant chemotherapy showed no local recurrence both clinically and radiologically. 88.9% of patients who have receive adjuvant chemotherapy showed no recurrence of axillary Lymphadenopathy. 94.45% of patients who have receive adjuvant chemotherapy showed no involvement of liver, brain, lung and bone both clinically and radiologically. **Conclusion:** It is concluded that both Radiological and Clinical response are same by both therapies. But, local recurrence, recurrence of axillary Lymphadenopathy and involvement of liver, brain, lung and bone both clinically and radiologically are less with adjuvant chemotherapy.

***Keywords:*** Adjuvant, neoadjuvant chemotherapy, breast cancer.

## INTRODUCTION

Breast cancer is among the leading cause of cancer related deaths in women. While it is the most common malignancy in women in the western world its incidence among female population of India ranks second after cancer cervix.[1]

Locally advanced breast cancer (LABC) is a term that refers to most advanced-stage non metastatic breast tumours and includes a wide variety of clinical scenarios. These tumours remain a difficult clinical problem as most patients with locally advanced disease will experience disease relapse and eventual death. Investigators have often differed in their precise definition of locally advanced breast cancer. Locally advanced disease also includes ?

patients with fixed axillary lymph nodes or ipsilateral supraclavicular, infraclavicular, or internal mammary nodal involvement. Thus, all of stage III disease is considered locally advanced, as is a subset of stage IIB (T3N0). Since the use of screening mammography has become widespread, the proportion of patients who have locally advanced disease at diagnosis has decreased.[2]

Data from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program, which encompasses approximately 14% of the U.S. population, indicate that 7% of patients have stage III disease at diagnosis. In populations that receive regular screening mammography, the percentage of patients with locally advanced disease is less than 5% .However, since only 50%–60% of women have had a recent mammogram, the national rates are higher. According to the SEER data, the 3- and 5-year relative survival rates for women with stage III breast cancer are 70% and 55%, respectively.

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Median survival for women with stage III disease is 4.9 years. These numbers, however, hide the heterogeneity of the disease and its prognosis, since the survival time for a woman with inflammatory breast cancer is significantly less than for a woman with a 5.1-cm tumour and a single involved axillary lymph node.[3]

The treatment of locally advanced breast cancer requires a combination of systemic chemotherapy, surgery, and radiotherapy to optimize the chance of cure. The earliest therapy for locally advanced breast cancer was radical mastectomy .However, patients with supraclavicular involvement, edema of the arm, satellite skin nodules, and extensive breast edema were all found to develop recurrences, and these signs were considered markers of inoperable disease.[4]

The benefit of adjuvant chemotherapy for the treatment of breast cancer has been clearly established, although most trials have not been specifically focused on patients with locally advanced disease. Initially, some authors demonstrated a survival benefit for women with node-positive breast cancer treated with CMF chemotherapy. The Early Breast Trialists' Collaborative Group published a meta-analysis of all known randomized trials of adjuvant chemotherapy and demonstrated a significantly lower mortality rate for women treated with chemotherapy .The benefit was independent of tumour size or nodal status, indicating that women with locally advanced disease are likely to receive the same proportional reduction in risk of recurrence as women with early breast cancer. .However, the data in aggregate clearly support the use of systemic chemotherapy for women with locally advanced breast cancer.[5,6]

Neoadjuvant chemotherapy was pioneered in the setting of locally advanced breast cancer .The administration of systemic chemotherapy prior to definitive local therapy is advantageous for women with locally advanced disease, since induction chemotherapy can render inoperable tumours (stage T4, N2, or N3) resectable and can increase rates of breast-conserving therapy Induction chemotherapy also has the theoretical advantages of early initiation of systemic therapy, delivery of drugs through intact vasculature, in vivo assessment of response to therapy, and the opportunity to study the biologic effects of chemotherapy. However, the use of neoadjuvant chemotherapy does result in the loss of standard and well-validated pathologic prognostic markers importantly; the survival rates of women treated with adjuvant or neoadjuvant chemotherapy are equivalent, making either approach reasonable for a woman with operable breast cancer. For inoperable disease, the initial approach should be chemotherapy with the goal of achieving respectability such as initial tumour size and the number of axillary lymph nodes involved.[7,8]

The aim of present study is to compare the effect of Adjuvant Chemotherapy and Neo-adjuvant Chemotherapy on Locally Advanced Breast cancer (LABC).

## MATERIALS AND METHODS

The study was conducted in Department of Surgery and Lala Lajpat Rai Memorial Medical College and associated Sardar Vallabh Bhai Patel Hospital (SVBP), Meerut.

The study included 35 female patients presenting to the surgery OPD of SVBP hospital with locally advanced breast cancer proven on biopsy out of which 17 patients received Neoadjuvant chemotherapy based on high tumour breast ratio, fixed lymph nodes in the axilla, fixed to the chest wall and multiple sattelite lesions. And 18 patients were operated as modified radical mastectomy and then they received the six cycle of adjuvant chemotherapy.

**Inclusion Criteria**

Female patients with locally advanced breast cancer proven on biopsy.

**Exclusion Criteria**

Pregnant and nursing women.
Distant metastasis
Previous cytotoxic or endocrine therapy
Deranged renal, hepatic or cardiac function
Known hypersensitivity to any of the chemotherapeutic agents used.

All enrolled cases had clinical assessment followed by radiological assessment with mammography and ultrasound and a core needle (Trucut) biopsy.

**Clinical Assessment**

Clinical staging of the disease was done with TNM classification. The primary tumour was measured in two dimensions using Vernier's callipers, taking longest diameter as one of the dimension. Subsequently entire breast was palpated in a sitting and supine position for the presence of any other lump. Similar examination was done for the contra lateral breast. Bilateral axillary examination was done for assessing lymph node status. Measurements were repeated after Neoadjuvant and adjuvant chemotherapy and response assessed with RECIST (Response Evaluation Criteria In Solid Tumours) criterion.

**Radiological Assessment**

This involves assessment of both breast with mammography and ultrasound. All the patients underwent imaging prior to core biopsy to prevent image distortion.

Film screen mammgraphy was done on the MAMMOMAT 3000 nova (Siemens) machine. Two standard views, cranio-caudal and medio-lateral

vertical. Supplementary views example spot compression and spot magnification were taken wherever required. Appropriate exposure factors for breast of different thickness were selected automatically by the control panel of the machine.
The following features of the mammogram were noted:
Type of parenchymal of breast – fatty, mixed or dense
Presence of any asymmetry of breast tissue
Characteristic of mass lesion location accurate size, shape, margins, density and effects on surrounding parenchyma.
Characteristics of calcification.
All the findings including the accurate measurements were confirmed on ultra sonography. Measurements were repeated Neoadjuvant and adjuvant chemotherapy and response assessed using RECIST criterion.

**Core Biopsy**
A core biospsy from the breast lump was taken under local anaesthesia using a 18G needle mounted on an automated firing device with spring loaded mechanism (Trucut Needle). After manual localization and immobilization of the lesion under complete aseptic conditions, a 2% lignocaine infiltrating anaesthetic was administered, and the skin incision performed, a biopsy specimen was obtained by means of three successive insertions with different angulation of the needle into the core of the lesion. The quantity and quality of the material obtained was judged after immediate immersion of the specimen in fixative, and the specimen was sent for histopathological examination.
The biopsy specimens were processed in a histokinette as follows:
Buffered formalin – 40 hrs
Tap water - 30 minutes
Acetone (3 changes) – 90 mins each
Xylene (2 changes) – 90 mins each
Paraffin wax (2 changes) – 2 hrs and 90 mins each
Paraffin blocks were made using Leukharts L mould. Multiple sections were cut by Spencers rotary microtome and 5 micron thick sections were mounted on slides albuminized and eosin staining.

**Staining Procedure**
Sections were first deparaffinised and hydrated by four changes in xylene and three changes in graded alcohol for 1 minute in each change.
Stained in Harris Haematoxylin for 15 mins
Rinsed in tap water
Differentiated in acid alcohol
Washed in tap water
Dipped in ammoniacal water under sections were bright blue
Washed in running tap water for 10 – 20 minutes
Stained with eosin for 1 min
Dehydrated by 95% absolute alcohol, 2 changes
Cleared in two changes of xylene, 2 mins each
Section were mounted in DPX

**Microscopic Examination**
Infiltrating ductal carcinoma:
Tumour showing sheets of highly pleomorphic, polygonal to round cells with large nuclei numerous mitotic figures with atypical features. The tumour cells infiltrating into stroma.

**Lobular Carcinoma**
The tumour cells were round and small with large nuclei. Cells were arranged in an Indian file pattern and diffusely infiltrating into the stroma.

**Assessment of receptor status**
Immunohistochemistry was performed with polymer based detection system for ER and PR.
Nuclear staining in more than 10% of tumour cells was considered +ve for both ER and PR.

**Neoadjuvant Chemotherapy**
The patients enrolled in the study receive a three cycle of FAC regime at an interval of 3 weeks.
FAC Group includes:
F: 5-flouroracil 500 mg per mt sq.
A: Adriamycin (Doxorubicin) 50 mg per mt. Sq.
C: Cyclophosphamide 500 mg per mt. Sq.
All patients received IV fluid prior and post to chemotherapy and pre-medicated with
Inj Ondansetron 4 mg i.v.
Inj Ranitidine 50 mg i.v.
Inj Chlorpheniramine 10 mg i.v.
Inj Dexamethasone 8 mg i.v.
All patients underwent rountine heamogram, kidney and liver function test and a electrocardiogram before and after the chemotherapy. A baseline echocardiogram was done in all patients before starting the first cycle of chemotherapy. In case of ECG changes in between cycles, an echocardiogram was requested and a cardiologist opinion was taken before administrating the next cycle of chemotherapy on the patient.

**Surgical Technique**
All the patients enrolled in the study underwent modified radical mastectomy with level II axillary clearance. The specimen was tagged with mark up for orientation during pathological examination. Each specimen was preserved in 10% buffered formaline prior to histopathological examination.

**Pathological examination**:
**Gross examination**
Each mastectomy specimen was anatomically oriented & measured in 3 dimensions. Skin, nipple & areola was examined for any abnormality. The specimen was palpated for any palpable lesions followed by slicing of the lesions at 1 cm intervals from the deep resected plane. Measurement for any lesion found on such sectioning was done on a millimeter scale. Gross observation for colour, texture margins & any haemorrhagic or necrotic foci was done. All other quadrants were similarly examined for the presence of any lesion or

abnormality. The axillary fat was incised to isolate all lymph nodes.

**Sections were taken from**

Lesions including margins and haemorrhagic or necrotic foci present.
Nipple & areola.
Each quadrant, involved or uninvolved.
All isolated lymph nodes, bisection of small lymph nodes or 2 mm macrosection of larger nodes.
The sections taken were processed in the exact same manner as the trucut biopsy specimens & then stained with haematoxylin & eosin.

**Pathological Response**

Comparison with the histopathology of the trucut biopsy was made & pathological response graded as follows:
Grade 1: some alteration to individual malignant cells but no reduction in overall numbers as compared with the pre-treatment biopsy.
Grade 2: a mild loss of invasive tumour cells but overall cellularity is still high.
Grade 3: a considerable reduction in tumour cells up to an estimated 90% loss.
Grade 4: a marked disappearance of invasive tumour cells such that only small clusters of widely dispersed cells could be detected.
Grade 5: no invasive tumour cells identifiable in the sections from the site of the previous tumour, i.e., only insitu disease or tumour stroma remained. Grade 5 responses were deemed to represent a complete pathologic response of the primary cancer.
Finally, the clinical & pathological response to neoadjuvant chemotherapy in each of the two arms was compared with pre-chemotherapy ER and PR status of the primary tumour.

**Statistical Analysis**

The data collected was statistically analysed by WILKOXONS SIGNED RANK TEST for neoadjuvant chemotherapy and percentage evaluation for results of adjuvant chemotherapy.

## RESULTS

**Result of Neoadjuvant Chemotherapy**

In this study it is assessed on the following parameters :

1. Longest diameter of tumor on clinical examination
2. Longest diameter of tumor on radiological assessment
3. Grade of tumor on pathological evaluation
   = Total no. of patient study=17

**Table 1: Effect of Neoadjuvant Chemotherapy on longest diameter of tumor on clinical examination.**

| Pre chemotherapy Status | | | Post chemotherapy Status | | |
|---|---|---|---|---|---|
| Mean | Standard Deviation | Median | Mean | Standard Deviation | Median |
| 7.84375 | 2.8047 | 7 | 4.775 | 2.093 | 5 |

*As the median is decreasing so the study is statistically significant

On applying data to the wilkoxons signed rank test the p-value comes out to be 0.0003 i.e., the result is statistically significant.

**Table 2: Effect of Neoadjuvant Chemotherapy on longest diameter of tumor on Radiological Assessment.**

| Pre chemotherapy Status | | | Post chemotherapy Status | | |
|---|---|---|---|---|---|
| Mean | Standard Deviation | Median | Mean | Standard Deviation | Median |
| 6.25 | 3.215 | 6.4 | 3.8625 | 2.378 | 4.1 |

*As the median is decreasing so the study is statistically significant

On applying data to the wilkoxons signed rank test the p-value comes out to be 0.0003 i.e., the result is statistically significant.

**Table 3: Effect of Neoadjuvant Chemotherapy on longest diameter of tumor on clinical examination based on Receptor Status:**
**Out of 17 Patient studied 10 patient were estrogen and progesterone receptor positive. Their result are as follows:**

| Pre chemotherapy Status | | | Post chemotherapy Status | | |
|---|---|---|---|---|---|
| Mean | Standard Deviation | Median | Mean | Standard Deviation | Median |
| 8.12 | 3.414 | 6.5 | 4.54 | 2.331 | 4 |

*As the median is decreasing so the study is statistically significant

On applying data to the wilkoxons signed rank test the p-value comes out to be 0.0.00512 i.e., the result is statistically significant.
Rest 7 patients were estrogen and progesterone receptor Negative.

**Table 4: Effect on patients who were estrogen and progesterone receptor Negative.**

| Pre chemotherapy Status | | | Post chemotherapy Status | | |
|---|---|---|---|---|---|
| Mean | Standard Deviation | Median | Mean | Standard Deviation | Median |
| 8.04 | 2.211 | 8 6.5 | 5.28 | 1.631 | 5.4 |

*As the median is decreasing so the study is statistically significant

As number of sample is 7 is not too large enough for the distribution of wilkoxons statistics to form a normal distribution, therefore it is not possible to calculate accurate p-value.

**Table 5: Effect of Neoadjuvant Chemotherapy on longest diameter of tumor on Radiological Assessment based on Receptor Status:**
**Out of 17 Patient studied 10 patient were estrogen and progesterone receptor positive. Their results are as follows:**

| Pre chemotherapy Status | | | Post chemotherapy Status | | |
|---|---|---|---|---|---|
| Mean | Standard Deviation | Median | Mean | Standard Deviation | Median |
| 6.52 | 4.221 | 5.95 6.5 | 3.33 | 2.408 | 2.75 |

*As the median is decreasing so the study is statistically significant

On applying data to the wilkoxons signed rank test the p-value comes out to be 0.0.00512 i.e., the result is statistically significant.
Rest 7 patient were estrogen and progesterone receptor Negative .

**Table 6: Effect on patients who were estrogen and progesterone receptor Negative.**

| Pre chemotherapy Status | | | Post chemotherapy Status | | |
|---|---|---|---|---|---|
| Mean | Standard Deviation | Median | Mean | Standard Deviation | Median |
| 6.98 | 2.938 | 6.4<br>6.5 | 4.86 | 2.065 | 5.3 |

*As the median is decreasing so the study is statistically significant

As number of sample is 7 is not too large enough for the distribution of wilkoxons statistics to form a normal distribution, therefore it is not possible to calculate accurate p-value.

**Result of adjuvant chemotherapy**

Out of 18 patients who have receive adjuvant chemotherapy after MRM results are evaluated on the basis of the following parameters :

1) Any local recurrence (on clinical examination)
2) Recurrence of axillary Lymphadenopathy (on clinical examination)
3) Liver, lung, brain and bone involvement (on clinical examination)
4) Any local recurrence (on radiological examination)
5) Recurrence of axillary Lymphadenopathy (on radiological examination)
6) Liver, lung, brain and bone involvement (on radiological examination)

=> only two(2) patients showed local recurrence on clinical examination out of 18 patients means 88.9% of patients showed positive response to adjuvant chemotherapy.
=> only two(2) patients showed local recurrence on radiological examination out of 18 patients means 88.9% of patients showed positive response to adjuvant chemotherapy.
=> only two(2) patients showed recurrence of axillary Lymphadenopathy on clinical examinaton out of 18 patients means 88.9% of patients showed positive response to adjuvant chemotherapy.
=> only two(2) patients showed recurrence of axillary Lymphadenopathy on radiological examinaton out of 18 patients means 88.9% of patients showed positive response to adjuvant chemotherapy.
=> only one(1) patients showed liver, brain, lung and bone involvement on clinical examinaton out of 18 patients means 94.45% of patients showed positive response to adjuvant chemotherapy.
=> only one(1) patients showed liver, brain, lung and bone involvement on radiological examinaton out of 18 patients means 94.45% of patients showed positive response to adjuvant chemotherapy.

Out of 18 patients those who were ER & PR positive showed no local recurrence, no recurrence of axillary Lymphadenopathy & no distant metastasis means receptor positivity is a good prognostic sign.

## DISCUSSION

35 patients were studied out of which 17 patient were given Neoadjuvant Chemotherapy and 18 patients were given Adjuvant Chemotherapy and their results were analyzed.
Out of 17 patients who have received Neoadjuvant Chemotherapy, the age of the patients 28 to 70years, peak incidence of cases ranging under 40 to 60 years, and the mean age of presentation is 48 years.
Out of 18 patients who have received Adjuvant Chemotherapy ,their age range from 35 to 70 years , peak incidence of cases ranginging under 40 to 60 years , and the mean age of presentation is 48 years.
Out of 17 patients who have received Neoadjuvant Chemotherapy ,maximum number of patients (9) Fall under stage T4bN1M of LABC. Out of 18 patients who have received Adjuvant Chemotherapy , maximum number of patients fall under stage T3N1M0 and T3N2bM0.(5 and 5)
Out of 17 patients who have received Neoadjuvant Chemotherapy, correlation between prechemotherapy clinical and radiological assessment for the longest diameter of tumor is 5 to 15 cm(with a mean of 8cm) on clinical examination and 2 to 14.1 cm(with a mean of 6.7cm) on radiological assessment. Similar studies were also conducted on African and turkish population by different authors.[9-11]

Out of 17 patients who have received Neoadjuvant Chemotherapy, correlation between postchemotherapy clinical and radiological assessment for the longest diameter of tumor is 1.4 to 9 cm(with a mean of 4.8 cm) on clinical examination(Out of 17 patients, complete reduction of tumour after Neoadjuvant chemotherapy was not achieved. However the maximum reduction was 72%. The maximum number of patients achieved an average of 40% reduction in tumour) and 0.6 to 8.2 cm(with a mean of 4cm) on radiological examination (Out of 17 patients, complete reduction of tumour after Neoadjuvant chemotherapy was not achieved. However the maximum reduction was 72%. The maximum number of patients achieved an average of 41% reduction in tumour). The study conducted in 2001 showed similar reduction (78%) in tumor size.[12]
Out of total 35 patients enrolled in the study, 17 were ER / PR positive and 18 were ER / PR negative. Patients receiving Neoadjuvant chemotherapy are maximum ER / PR +ve Whereas patients receiving Adjuvant chemotherapy are maximum ER / PR -ve.

**Clinical response of neoadjuvant chemotherapy based on receptor status**

Out of total 17 patients who received Neoadjuvant chemotherapy, 10 were ER / PR positive and 7 were ER / PR negative.

Out of 10 ER / PR +ve patients:Partial Response achieved for 80% of the patients. Stable disease achieved for 20% of the patients. Complete response was Nil.

Out of 7 ER / PR -ve patients: Partial Response achieved for 43% of the patients. Stable disease achieved for 57% of the patients. Complete response was Nil.

Similar results were shown by the authors Orel Greenstein S, Balu-Maestro.[13,14]

**Radiological response of neoadjuvant chemotherapy based on receptor status**

Out of total 17 patients who received Neoadjuvant chemotherapy, 10 were ER / PR positive and 7 were ER / PR negative. Out of 10 ER / PR +ve patients:Partial Response achieved for 80% of the patients.Stable disease achieved for 20% of the patients.Complete response was Nil. Out of 7 ER / PR -ve patients:Partial Response achieved for 43% of the patients.Stable disease achieved for 57% of the patients.Complete response was Nil. It is concluded that the Response of Radiological and Clinical response are same. Similar response was shown by authors Londero V, Smith PJ.[15,16]

**Pathological response of neoadjuvant chemotherapy based on receptor status**

Out of total 17 patients who received Neoadjuvant chemotherapy, 10 were ER / PR positive and 7 were ER / PR negative. Out of 10 ER / PR +ve patients:9 showed Grade 2 response1 showed Grade 3 response Out of 7 ER / PR -ve patients:5 showed Grade 2 response2 showed Grade 3 response. These responses were comparable to the results of Hayes DF and Andre F.[17,18]

**Clinical response of neoadjuvant chemotherapy based on recist criteria**

Out of total 17 patients who received Neoadjuvant chemotherapy, based on RECIST (Response Evaluation Criteria In Solid Tumors):

11 showed Partial response 6 showed Stable Disease Complete response was Nil.

**Radiological response of neoadjuvant chemotherapy based on recist criteria**

Out of total 17 patients who received Neoadjuvant chemotherapy, based on RECIST (Response Evaluation Criteria In Solid Tumors): 11 showed Partial response6 showed Stable Disease Complete response was Nil. It is concluded that Clinical and Radiological response are same. Similar response was also seen by Geisler J and Yamauchi H.[19,20]

**Pathological response of neoadjuvant chemotherapy**

Maximum patients (59%) achieved Grade 2 pathological response to Neoadjuvant chemotherapy (FAC).

Out of total 18 patients who received Adjuvant chemotherapy, Maximum patients (88.89%) showed no Local recurrence to adjuvant chemotherapy on Clinical examination.

Out of total 18 patients who received Adjuvant chemotherapy, Maximum patients (88.89%) showed no Recurrence of Axillary Lymphadenopathy to adjuvant chemotherapy on Clinical examination.

Out of total 18 patients who received Adjuvant chemotherapy, Maximum patients (94.44%) showed no involvement of liver, lung, brain & bone (on Clinical examination).

Out of total 18 patients who received Adjuvant chemotherapy, Maximum patients (88.89%) showed Negative response to Local recurrence to adjuvant chemotherapy on Radiological examination.

Out of total 18 patients who received Adjuvant chemotherapy, Maximum patients (88.89%) showed Negative response to Recurrence of Axillary Lymphadenopathy to adjuvant chemotherapy on Radiological examination.

Out of total 18 patients who received Adjuvant chemotherapy, Maximum patients (94.44%) showed Negative response to Liver, lung, brain & bone metastasis (on Radiological examination).

## CONCLUSION

The study has shown a later age of presentation of patients of patients with LABC in our hospital compared to similar studies in the Western world.

- Patients present in a more advanced stage of disease in comparison to similar studies in the western world.
- Clinically measured size of tumour correlates well with the radiological assessment of the same.
- There was significant reduction of tumour size both clinically and radiologically.
- There was significant reduction of tumour size both clinically and radiologically in ER/PR+ve as well as ER/PR-ve patients but more decrease in ER/PR+ve patients means receptor positivity is a good prognostic sign.
- 88.9% of patients who have receive adjuvant chemotherapy showed no local recurrence both clinically and radiologically.
- 88.9% of patients who have receive adjuvant chemotherapy showed no recurrence of axillary Lymphadenopathy.
- 94.45% of patients who have receive adjuvant chemotherapy showed no involvement of liver, brain, lung and bone both clinically and radiologically.

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