



Study of Factors Responsible for Delay in Diagnosis and Management of Breast Cancer Patients at a Tertiary Care Center Rural Medical College. A Cross Sectional Study

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Abstract

Background: Breast cancer is the most common cancer among Indian women and the majority of cases are locally advanced at presentation. The majority of the population in India, live in villages, and in the rural set-up the unregistered medical practitioner (quack) acts as the gatekeeper to medical services. There are enough randomized trials based on mammographic screening that have provided strong evidence that early diagnosis and treatment of breast cancer can reduce the breast cancer mortality.

Aim and Objective: 1. To determine the factors and magnitude that influence patient delay among women with breast cancer. 2. To study clinical profile of breast cancer cases. 3. To study correlation of various risk factors of delay

Method: Study design: A cross sectional study. Study setting: Department of surgery at tertiary care centre. Study duration: 3 Years. Study population: The study population included all Female patient of 18 years and above with a confirmed histological diagnosis of Breast Cancer with written informed consent such cases were included in the study. Sample size: 150.

Results: Majority of the patients presented in the 45-55 years age group i.e. 57 (38%) patients, followed by 39 (26%) patients in the above 55 years age group, 37 (24.66%) in the 35-44 years and 17 (11.33%) in the below 35 years age group. The mean age of patients in our study was 48.4 years with a range from 18-78 years. Involvement of breast cancer was found to be more on the left side i.e. 83 (53.33%) cases compared to the right side i.e. 67 (44.66%) cases. The histology of majority of cases were invasive ductal carcinoma i.e. 147 (98%) patients. There were 2 (1.33%) patients with invasive lobular carcinoma and 1 (0.66%) patient with medullary carcinoma. The majority of [86 (57.33%)] patients, had grade II tumor at presentation, 44 (29.33%) patients had grade III tumor and 20 (13.33%) patients had grade I tumor at presentation. The mean duration of delay in (in days) in patients of >3 months delay was 130.6 days in primary delay, 77.65 days in secondary delay and 74.6 days in tertiary delay.

Conclusions: There is an urgent need to strengthen primary level care for all patients presenting with breast symptoms. Awareness about breast health in general and cancer in particular demands enhancement amongst Indian population. Need for universal education to achieve reduction in delay. Medical factors are also responsible for delays. There is a need to set up optimum time for diagnosis and treatment initiation in breast cancer. In India, there is a need to have well defined referral pattern. Reduction of delays in diagnosis and treatment may reduce the advance stage of cancer.

Keywords: Breast Cancer; Type of Delay; Histological Type; Factors of Delay

Introduction

Breast carcinoma is the most common malignant tumour and the leading cause of cancer death in women, with more than one million cases occurring worldwide every year and represents over 20% of all malignancies among females (Parkin DM., et al. 2001) [1]. Cancer is leading cause of death in many countries despite the advancement in treatment and diagnostic modality. Worldwide, breast cancer is the most common type and most common cause of cancer mortality among women (Parkin DM., et al. 2001) [1].

The majority of women present with advanced disease stage III and IV and the 5 years survival rate is less than 50% (Parkin DM., et al. 2001) [1]. Breast cancer incidence is increasing in India. According to recent GLOBOCAN 2018 data there were 162468 incident of breast cancer and 87090 deaths were due to breast cancer. 5 years prevalence was 405456. Breast cancer has the highest incidence and prevalence among other carcinomas.

Delayed patient presentation refers to a prolonged interval between discovery of initial symptoms to presentation to a provider

and typically defined as greater than 12 weeks as periods longer than this have been associated with poorer survival (Ramirez, *et al.* 1999) [2]. Breast cancer is the most common cancer among Indian women and the majority of cases are locally advanced at presentation.

The majority of the population in India, like in other developing countries, live in villages, and in the rural set-up the unregistered medical practitioner (quack) acts as the gatekeeper to medical services. There are enough randomized trials based on mammographic screening that have provided strong evidence that early diagnosis and treatment of breast cancer can reduce the specific mortality.

Moreover, in a recent systematic review of published studies, delays of 3–6 months between the onset of symptoms and the institution of treatment have been clearly found to reduce the survival rates for breast cancer patients (Saxena, *et al.* 2005) [3]. The population based cancer registry data from the various parts of the country, has revealed breast cancer as the commonest cancer among women in Delhi, Mumbai, Ahmedabad, Calcutta and Trivandrum.

In the rest of the other Indian registries, breast cancer is listed as the second leading site among women. Statistical study conducted in Jaipur region shows breast malignancies form the sixth most common site of carcinoma in both sexes combined (i.e., 8.47% of all malignancies). In females, it is the most common site of malignancy (20.44%), whereas in males it constitutes only 0.19%. (Sharma, *et al.* 2009) [4].

Breast cancer has now surpassed cancer cervix as the most common cancer in Indian women. Over the past several decades there has been a fairly steady rise in the incidence of the disease. The age standardized incidence rates vary between 9-32 per 100,000 women (Takiar R, Srivastav A. 2008) [5]. Same statistical data observed in eastern Rajasthan cancer profile, which shows Cancer of the female breast (19.4%) surpassed cancer cervix (18.2%) (Sharma, *et al.* 2014) [6].

Breast cancer is a heterogeneous disease with variable biological and clinical characteristics because of its different genetic makeup (Mona M., *et al.* 2007) [7]. It has been documented that factors such as age, age at menarche, marital status, age at menopause, place of residence (rural/urban), religion and family history of breast cancer can all play roles as risk factor.

Cancer incidence rates, while still lower compared with many western countries have been changing over recent decades. One of the main reasons for this changing trend is delay in diagnosis or initiation of treatment at advanced stage (Neal RD., *et al.* 2009) [8]. Prolonged duration of diagnosis and treatment increases the proportion of advanced stages in cancer patients and has an impact on poor prognosis and quality of life (Dwivedi AK., *et al.* 2014) [9].

Patient delayed presentation has been associated with increase tumour size, more advanced stage at presentation and poorer long term survival (Burgess cc 1998) [4]. The association between patient delay and socio-demographic factors, cancer knowledge, has been widely studied and longer delay is associated with more advanced stage (Richards MA., *et al.* lancet. 1999) [5].

Aim and Objectives

- To determine the factors and magnitude that influence patient delay among women with breast cancer.
- To study clinical profile of breast cancer cases
- To study correlation of various risk factors of delay.

Material and Methods

- Study design: Cross Sectional study
- Study setting: Department of Surgery at tertiary care centre
- Study duration: 3 Years
- Study population: The study population included all cases with breast cancer such cases were included in the study.

Inclusion criteria

Female patient of 18 years and above with a confirmed histological diagnosis of Breast Cancer with written informed consent.

Exclusion criteria

- Patient who were too ill to give sufficient information
- Patient having another cancer
- Breast Cancer Patients on follow-up
- Not willing to participate in study
- Incomplete Questioners

Approval for the study

Approval from Institutional Ethics committee was obtained. Written approval of surgery department and related department was obtained. After obtaining informed consent from all cases with confirmed diagnosis of breast cancer such cases were included in the study.

- **Sample Size:** A sample of 150 patients with breast cancer was included.
- **Sampling technique:** Using purposive sampling technique a total of 150 cases with confirmed diagnosis of breast cancer such cases were included in the study.

Methods of data collection and questionnaire

Pretested questionnaire was used to record the necessary clinical and demographic information. Questionnaires included general information, such as age, sex, address, level of education, occupation, marital status, symptoms, family history of cancer, menopausal status and histological type.

Operational definition of delay

- **Primary Delay:** Duration between onset of symptoms to first presentation to medical person.
- **Secondary Delay:** Time from contacting to medical person to confirm diagnosis.
- **Tertiary Delay:** The time from confirm diagnosis to treatment (Surgery).

Study procedure

This study was conducted in surgery Department of tertiary care center, in who satisfied the above said inclusion and exclusion

criteria and this study conducted from 01/07/19 to 30/06/2022.

Data entry and analysis

The data were entered in Microsoft Excel and data analysis was done on SPSS no 21 for Windows. The analysis was performed by using percentages in frequency tables, $p < 0.05$ was considered as level of significance using the Chi-square test.

Results and Observations

The present Cross sectional study was carried out among 150 cases of breast cancer involvement of breast cancer was found to be more on the left side i.e. 83 (53.33%) cases compared to the right side i.e. 67 (44.66%) cases. the histology of majority of cases were invasive ductal ca i.e. 147 (98%) patients. There were 2 (1.33%) patients with invasive lobular ca and 1 (0.66%) patient with medullary ca. majority of patients presented with lump without pain, i.e. 81 (54%) cases, followed by 38 (25.33%) patients who presented with lump with pain, 23 (15.33%) patients presented with ulceration and 8 (5.3%) patients with nipple discharge. majority were illiterate i.e. 77 patients (51%), 16 patients (11%) had completed primary education, 17 patients (11%) had completed secondary school and 40 patients (27%) had completed tertiary education.

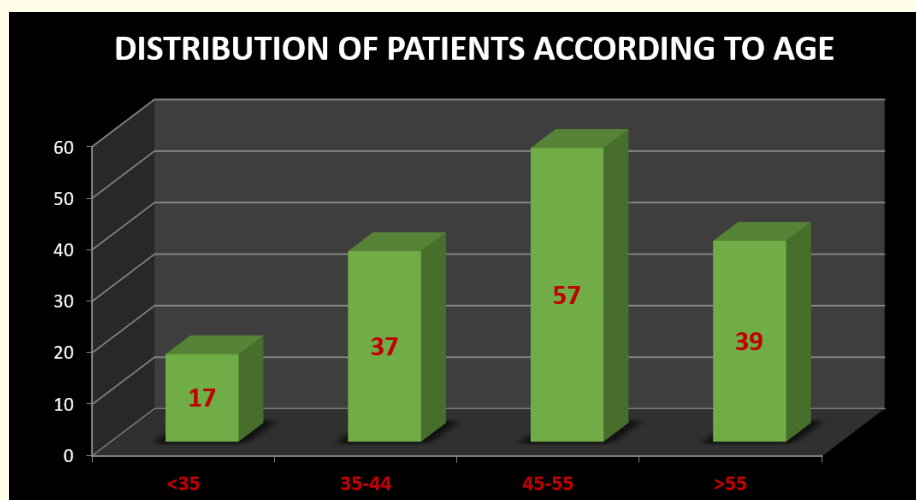


Figure 1

Above figure shows that majority of the patients presented in the age group of 45-55 years [57 (38%)] patients, This was followed by 39 (26%) patients in the above 55 years age group, 37 (24.66%) in the 35-44 years and 17 (11.33%) in the below 35

years age group. The mean age of patients in our study was 48.4 years and range from 18-78 years. Dr. Ajay please check normal distribution of data. If it is normal give mean and S.D. If it is not normal give median and interquartile range.

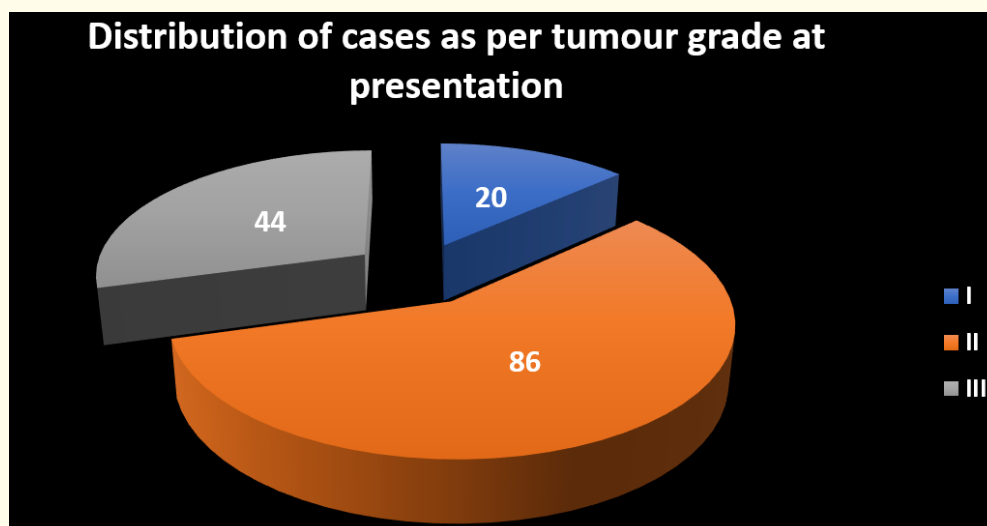


Figure 2

Above figure shows among the 150 cases, majority i.e. 86 (57.33%) patients, had tumor grade II at presentation, 44 (29.33%) patients had tumor grade III and 20 (13.33%) patients had tumor grade I at presentation.

| Age group | DELAY < 3 MONTHS (%) | DELAY > 3 MONTHS (%) | Total (percentage) |
|-----------|----------------------|----------------------|--------------------|
| <35 | 2(6.66) | 15(12.5) | 17(11.33%) |
| 35-44 | 7(23.33) | 30(25) | 37(24.66%) |
| 45-55 | 17(56.66) | 40(33.33) | 57(38%) |
| >55 | 4(13.33) | 35(29.16) | 39(26%) |
| TOTAL | 30 | 120 | 150 (100%) |

Table 1: Age wise distribution of delay in presentation of patients. {Chi-square = 6.50, df = 3, P = 0.118} Chi square test comparing proportion of patients in different age groups.

Correlation of age with delay statistically not significant at $p > .05$.

| Family history of breast cancer | DELAY <3 MONTHS (%) | DELAY >3 MONTHS (%) | Total (%) |
|---------------------------------|---------------------|---------------------|-------------|
| Present | 4(13.33) | 7(5.83) | 11(7.33%) |
| Absent | 26(86.66) | 113(94.16) | 139(92.66%) |
| Total | 30 | 120 | |

Table 2: Delay in presentation of patients on the basis of family history of breast cancer.

Chi-square = 1.036, df = 3, P = 0.309.

Correlation of delay in presentation on the basis of family history statistically not significant at $p > .05$.

The family history of breast cancer was present and delay was <3 months i.e. 4(13.33%) patients, delay was >3 months i.e. 7(5.83%) patients and total was 11(7.33%) patients. The family history of breast cancer was absent and delay was <3 months i.e. 26(86.66%) patients, delay was >3 months i.e. 113(94.16%) patients and total was 139(92.66%) patients. So, delay was <3 months whether family history of breast cancer is present or absent total is 30. And delay was >3 months total is 120.

| First contact | DELAY <3 MONTHS (%) | DELAY >3 MONTHS (%) | Total (%) |
|---------------|---------------------|---------------------|-----------|
| Medical | 19(63.33) | 83(69.66) | 102(68%) |
| Non medical | 11(36.66) | 37(30.33) | 48(32%) |
| Total | 30 | 120 | |

Table 3: Delay in presentation of patients on the basis of consultation by non medical practitioner.

Chi-square = 0.155, df = 1, P = 0.694.

Correlation of Delay in presentation of patients on the basis of consultation by non medical practitioner statistically not significant at $p > .05$.

The delay in presentation of patient on the basis of consultation <3 months delay was 19 days in medical practitioner, 11 days in non-medical practitioner. And >3 months delay was 83 days in medical practitioner and 37 days in non-medical practitioner.

| Type of delay | MEAN DURATION OF DELAY (in days) IN PATIENTS OF <3 MONTHS DELAY(mean ± SD) | MEAN DURATION OF DELAY (in days) IN PATIENTS OF >3 MONTHS DELAY(mean ± SD) | In total patients (mean ± SD) |
|-----------------|--|--|-------------------------------|
| Primary delay | 33.58 ± 23.46 | 130.6 ± 220.6 | 111.2 ± 201.1 |
| Secondary delay | 14.8 ± 15.04 | 77.65 ± 125 | 65.08 ± 114.7 |
| Tertiary delay | 23.03 ± 20.66 | 87.49 ± 45.28 | 74.6 ± 48.88 |
| P value | 0.002 | 0.014 | 0.009 |

Table 4: Mean duration of delay (in days) in primary, secondary and tertiary delay.

Correlation of Mean duration of delay (in days) in primary, secondary and tertiary delay is statistically significant at $p > .05$.

The mean duration of delay (in days) in patients of <3 months delay was 33.53 days in primary delay, 14.8 days in secondary delay and 23.3 days in tertiary delay.

Whereas, the mean duration of delay (in days) in patients of >3 months delay was 130.6 days in primary delay, 77.65 days in secondary delay and 74.6 days in tertiary delay.

Discussion

The delayed presentation of patients with breast cancer refers to a prolonged interval between discovery of initial symptom by the patient herself to presentation to a medical provider and is typically defined as greater than 12 weeks as period longer than this has been associated with poorer survival [4].

Majority of the patients presented in the 45-55 years age group i.e. 57 patients, followed by 39 patients in the above 55 years age group, 37 in the 35-44 years and 17 in the below 35 years age group. The mean age of patients in our study was 48.4 years (range 18-78 years) which was similar to the study by Odongo, *et al.* [10] in which mean age was 45.12 years.

Out of the total 150 cases, involvement of breast cancer was found to be more on the left side i.e. 83 cases compared to the right side i.e. 67 cases. Similar result found in the study of Odongo, *et al.* [10], The histology of tumor was majority of cases were invasive ductal carcinoma in most women. There with 2 patients having invasive lobular carcinoma and 1 patient with medullary carcinoma. Out of the 150 the majority were post-menopausal i.e. 82 cases (55%), and 68 cases (45%) were pre-menopausal.

The majority i.e. 86 patients, had tumor grade II at presentation, 44 patients had tumor grade III and 20 patients had tumor grade I at presentation. Similar result was reported by (Burgess *et al.* 1998) [4].

The majority were illiterate i.e. 77 patients (51%), 16 patients (11%) had completed primary education, 17 patients (11%) had

completed secondary school and 40 patients (27%) had completed tertiary education. Similar result reported by Nitin Gangane, *et al.* 2015 [11].

In the present study the total number of patients with a delay in presentation of less than 3 months were 30 and number of patients with delay in presentation more than 3 months were 120.

Out of the patients with delay in presentation less than 3 months, majority were present in the age group of 45-55 years i.e. 17 out of 30 patients, and among the patients with delay in presentation more than 3 months majority were present in the same age group of 45-55 years i.e. 40 out of 120 patients. Similar result observed in the study conducted by Chintamani, *et al.* 2011 [12].

In our study minimum number of patient were in the age group of less than 35 years, i.e. 17 patients among which 2 patients presented with a delay less than 3 months and 15 patients presented with a delay more than 3 months. Similarly, according to the study conducted by Nitin Gangane, *et al.* 2015 [11] maximum patient delay was present in age group of 41-50 years and minimum delay was present in age group of less than 40 years. According to the study conducted by Chintamani, *et al.* 2011 [12] maximum delay is present in age group of 40-55 years and minimum delay is present in age group of more than 55 years.

Among the patients who presented with delay in presentation of more than 3 months majority of the patients were illiterate. I.e. 75 patients out of 120. This was in accordance to the study conducted by Chintamani, *et al.* 2011 [12] 61% patients were illiterate and maximum delay was present in illiterate group. According to A. K. Dwivedi, *et al.* [9] maximum number of patients comes in illiterate group and this group had maximum delay. Similarly, according to study conducted by Nitin Gangane, *et al.* 2015 [11] maximum number of patients were in the group with below higher secondary education (can read and write) and maximum delay is also present in this group. Minimum delay was present in higher secondary and above education group.

In the present study, majority of patients with delay in presentation of less than 3 months had no family history of breast cancer i.e. 26 out of 30 patients. Whereas, 4 patients had family history of breast cancer.

Among the patients who presented with delay in presentation of more than 3 months, majority had no family history of breast cancer i.e. 113 patients out of 120. Whereas, 7 patients had family history of breast cancer. According to study conducted by Nintin gangane., *et al.* 2015 [11] maximum number of patients came in group with no family history of breast cancer and presented late in comparison to patients with family history of breast cancer. According to study of Odongo., *et al.* [10] maximum number of patients were in the group with no family history of breast cancer and this group had more delay in comparison to group with family history of breast cancer.

In the present study, majority of patients with delay in presentation of less than 3 months had at first contact consulted a medical practitioner i.e. 19 out of 30 patients. Whereas 11 patients had consulted a quack/non-medical professional.

Among the patients who presented with delay in presentation of more than 3 months majority of the patients at first contact had consulted a medical professional. I.e. 83 patients out of 120. Whereas 37 patients had consulted a quack/non-medical professional. According to study conducted by Chintamani., *et al.* 2011 [12] first contact with nonmedical person was higher in illiterate patients and presented with higher stages of breast cancer. First contact with nonmedical person was less in educated group and present with less higher stage of breast cancer.

The mean duration of delay in (in days) in patients of <3 months delay was 33.53 days in primary delay, 14.8 days in secondary delay and 23.3 days in tertiary delay. Whereas, the mean duration of delay in (in days) in patients of >3 months delay was 130.6 days in primary delay, 77.65 days in secondary delay and 74.6 days in tertiary delay. Total mean duration was 111.2 days.

According to A. K. Dwivedi., *et al.* [9] maximum number of patients come in group which delays more than 3 month maximum delay was present in primary delay group. That may be affected by patient (lack of awareness, ignorance, family related problem, fear of cancer).

Secondary delay was found to be higher in patients with delay more than 3 months. It may be due to lack of awareness, fear

of cancer, family related problem, misdiagnosis and symptomatic treatment.

Tertiary delay is mostly system related to issues like referral, long waiting list for chemotherapy, and family related problem.

Mean total delay was 194 days in patients of different type of cancer i.e. Breast, extremity, head and neck, and miscellaneous. Mean primary delay was 101.7 days p value = 0.00, mean secondary delay was 142.1 days, p value = 0.64 and mean tertiary delay was 97.5 days p value = 0.75.

Conclusion

- The mean age of presentation of breast cancer in our study was 48.4 years and range from 18-78 years.
- Screening programs to reduce the diagnosis delay are amenable in breast cancer thus identifying the important cofactors that can be modifiable through appropriate intervention programs related to delay would not only reduced delays in diagnosis but also minimize time in initiating treatment.
- Education of patient and head of family is an important factor in delay educated patients present with less delay. Awareness of cancer and ignorance is also an important factor in breast cancer patients. patients with knowledge of cancer present early to health system. a deficiency of sufficient knowledge, information and awareness in our population regarding this fatal disease Specific attention should be conducted to increase the awareness among general practitioners for improving breast cancer prognosis by early diagnosis and treatment.
- First contact with medical or nonmedical practitioner also important factor. Patients with first contact with medical practitioner presented early and who presented to nonmedical presented late.
- Need for universal education to achieve reduction in delay. Medical factors are also responsible for delays. There is a need to set up optimum time for diagnosis and treatment initiation in breast cancer. In India, there is a need to have well defined referral pattern. Reduction of delays in diagnosis and treatment may reduce the advance stage of cancer.

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