

ASSESSMENT OF VARIOUS RISK FACTORS OF BREAST CANCER

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ABSTRACT

Objectives: The main objectives of this study were to assess the various modifiable and non modifiable risk factors of breast cancer and to study the various chemotherapeutic regimens prescribed for the treatment of breast cancer.

Methods: It was a prospective observational study carried out for 6 months (1st July-31st December 2012) at the department of medical oncology of Amrita Institute of Medical Sciences, Kochi, Kerala India. Total 180 patients who visited the department of medical oncology during the study period and who satisfied the inclusion and exclusion criteria were included in the study. A standardized data collection form was prepared and necessary data were collected from patients and/or caregivers.

Results: The maximum numbers of patients were in the age group of 51-60. Most of the patients was postmenopausal and married. 73.88% patients were residing in urban area. 73.33% patients don't have any family history of cancer. Only 30 patients undergone hysterectomy and 150 were not. In this study out of 180 patients only 9(5%) had a history of HRT/OCT use. Majority of patients had hypertension as the co morbidity followed by diabetes mellitus. 103 patients were obese. 51 patients had their first menarche at the age of 14 and gave their first child birth at an age of 25 and breast fed for an average of 2 years.

Conclusion: Awareness of various risk factors of breast cancer will help in early detection of breast cancer and can save thousands of lives.

Keywords: Risk factor assessment, Breast cancer, Preventable and non preventable risk factors.

INTRODUCTION

Cancer known medically as a malignant neoplasm is a broad group of various diseases, all involving unregulated cell growth. Breast cancer is a type of cancer originating from breast tissue most commonly from the inner lining of milk ducts or the lobules that supply the ducts with milk. Worldwide breast cancer comprises 22.9% of all cancers in women is 100 times and is more common in women than in men, although men tend to have poorer outcomes due to delays in diagnosis. The incidence of breast cancer is rising in every country of the world especially in developing countries such as India. The American Cancer Society estimates that risk being 13% in 2012 or more than 1 in 8. [1]

A "risk factor" of breast cancer is anything that increases the risk of developing breast cancer. The main objective of this study was to assess various preventable (modifiable) and non-preventable (non-modifiable) risk factors of breast cancer. Many of the most important risk factors of breast cancer are beyond control (non-preventable) such as age, family history, and medical history. However there are some risk factors that are modifiable (preventable) such as overweight, physical inactivity, alcohol consumption etc. [2]

The preventable risk factors include: Over weight- Being overweight defined as having a BMI more than 25 and is associated with increased risk of breast cancer, especially for women after menopause. Fat tissue is the body's main source of estrogen after menopause, when the ovaries stop producing hormone. Having more fat tissue means having more estrogen level which in turn can increase breast cancer risk. Research shows that regular exercise can reduce the risk of breast cancer. The American Cancer society recommends 45-60 minutes of physical exercise 5 or more days/week. Exercise consumes and control blood sugar level and limits blood limits of insulin growth factor. [3]

Diet is a suspected risk factor for many cancers including breast cancer. Eating too much of cholesterol rich food and other fats increases the risk for cancer. In women smoking and alcoholism increases the breast cancer risk. [4, 5] Current or recent past users of HRT have a higher risk for being diagnosed with breast cancer. Largest meta-analysis (in 1997) data from 51 observational studies indicated a relative risk of breast cancer of 1.35 for women who had used HRT for 5 or more years after menopause. Using oral

contraceptives for longer periods appears to slightly increase the risk for breast cancer. The main mechanism by which environmental compounds increase breast cancer risk are by acting like hormones, especially estrogen, or increasing susceptibility to carcinogenesis.[6,7]

The non preventable risk factors include Age: The risk of breast cancer increases with age. That's because the longer one live there are more opportunities for genetic damage (mutation) in the body. Being women is the most significant risk factor for developing breast cancer. Women's breast cells are constantly changing and growing mainly due to the activity of female hormones estrogen and progesterone.[8,9] Women who started menstruating younger than age 12 have a higher risk of breast cancer later in life. This is same for women who go through menopause when they are older than 55. Women who give first child birth and breast feed by the age of 20 may have even greater protection against breast cancer. For women who are breast feeding may have slightly lower breast cancer risk especially if they continue for 1.5 and 2years.[10,11] In 5% of breast cancer cases, there is strong inherited familial risk. Women with close relatives who have been diagnosed with breast cancer have a higher risk of developing the disease. People who have previously been diagnosed with breast, ovarian, uterine or bowel cancer have a higher risk of developing breast cancer in the future.[12,13] Prophylactic oophorectomy and mastectomy in individuals with high risk of mutation in BRCA1 and BRCA2 reduces the risk of getting breast cancer as well as reducing the risk of developing ovarian cancer.[14,15]

MATERIALS AND METHODS**Study design**

Prospective- observational study.

Study Period

The study was an observational study completed over a period of 6 months from 1st July 2012 to 31st December 2012.

Study site

The study was conducted at the department of medical oncology, Amrita Institute of Medical Sciences (AIMS), Kochi, Kerala, India.

Study population

Study patients consisted of out-patients who were undergoing chemotherapy in the department of medical oncology during the study period and who satisfied the inclusion and exclusion criteria.

Patient selection

Inclusion criteria

1. Female patients of all age group who were diagnosed to have breast cancer.
2. Out-patients who were undergoing chemotherapy for breast cancer in the specialized day care unit.

Exclusion criteria

1. Male breast cancer patients.
2. Foreign patients diagnosed to have breast cancer.
3. All in-patients diagnosed with breast cancer.

Sample size

Sample size (n) is calculated statistically on the basis of incidence rate of breast cancer in India and it is found to be > 141. All out-patients who were diagnosed to have breast cancer and who were undergoing chemotherapy in the department of medical oncology during the study period and those who satisfied inclusion and exclusion criteria were included in the study.

Data collection

Patient data relevant to the study was obtained by interviewing the patients and/or their caregivers and by the examination of patient's medical record and recorded in the standardized data collection form. The data collection form provided the information regarding the demographic details of the patient which includes age, sex, social history etc. Patient's co morbid conditions, marital status, various risk factors like pregnancy history, breastfeeding history, age of first child birth, use OCT or HRT, BMI etc were also collected. Form also included the individual patient's chemotherapy regimen.

RESULTS AND DISCUSSION

A total of 180 female patients who satisfied the inclusion and exclusion criteria were included in this study. The maximum number of patients were in the age group of 51-60 ie, 68 (37.77%) and 65(36.11%) were in the age group of 41-50 years of age (Table 1). In contrast, in the study titled "Risk factors for breast cancer among women attending a tertiary care hospital in southern India" done by Prince Antonio Harrison et al most of the patients (46%) were in the age group 45 - 54. [16,17]

Table 1: It shows age distribution of study patients

Age Group	No. of patients	Percentage
≤30	1	0.55%
31-40	14	7.7%
41-50	65	36.11%
51-60	68	37.77%
61-70	30	16.66%
71-80	1	0.55%
≥80	1	0.55%

Out of 180 patients 107(59.44%) patients were postmenopausal, 61(33.88%) were premenopausal and the rest were perimenopausal (Table 2). Among 180 patients 177 were married and only 3 were single. In a review of "Breast Cancer in India: Where Do We Stand and Where Do We Go?" by Anita Khokhar reported that the risk of affecting breast cancer is 4-5 folds for single women than married women which is contrary to our results. The changes in life style is also an important risk factor for getting cancer. [18] Almost 3/4th of the patients who were included in this study were staying in urban area i.e, 133(73.88%) and only 47(26.11%) were staying in rural area. In Croatia a study conducted by Valerija Stamenic et al on Urban-rural differences in a population based breast cancer screening program concluded the same as these results.

132(73.33%) patients do not have any family history of cancer but 48(26.66%) patients had some kinds of cancer in their first degree relatives. [19]

Table 2: It shows Menopausal status of patients

Menopause	No. of patients	Percentage
Postmenopausal	107	59.44%
Premenopausal	61	33.88%
Perimenopausal	12	6.66%

Risk of breast cancer is approximately doubled among women whose mother had breast cancer diagnosed before the age of 40 years or who have a sister with breast cancer, and remains elevated even for those whose mothers were diagnosed with breast cancer at the age of 70 years or older is reported by Graham A. Colditz et al. [20] Whereas in this study 132(73.33%) patients don't have any family history of cancer but 48(26.66%) patients had some kinds of cancer in their first degree relatives. 30 (16.66%) were undergone hysterectomy and 150(83.88%) were not (Fig. 1). Reproductive organ surgeries may alter ovarian hormone levels, thereby affecting breast cancer risk. The chance of getting breast cancer is more in women who undergone hysterectomy is demonstrated by David J. Press et al. [21]

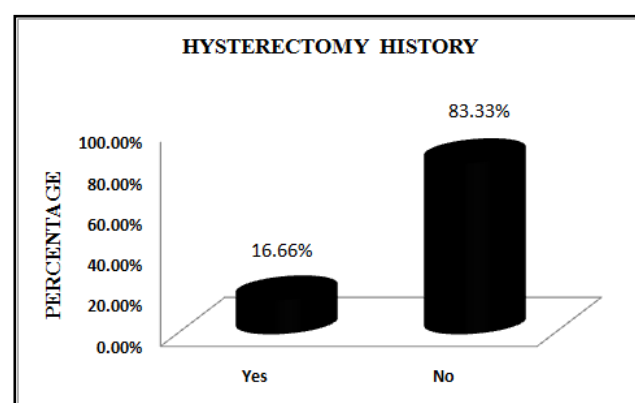


Fig. 1: It shows Hysterectomy history

Hormonal replacement therapy or use of oral contraceptives will also influence in getting breast cancer. In this study out of 180 patients only 9(5%) had a history of HRT/OCT use and the rest 171(95%) were not taken any HRT/OCT in the past. The largest no. of patients (28.88%) had hypertension as the co-morbidity followed by diabetes mellitus (27.22%) and dyslipidemia (16.66%) (Table 3).

Table 3: It shows Co-morbidities of patients

Co morbidities	No. of patients	Percentage
Hypertension	52	28.88%
Diabetic melitus	49	27.22%
Dislipidimia	33	18.33%
Hypothyroidism	11	6.11%
Hyperthyroidism	7	3.88%
Cancer*	6	3.33%
Asthma	5	2.77%
Hepatitis	2	1.11%
Cervical spondyllysis	2	1.11%
Angina	1	0.55%
Osteoporosis	1	0.55%
Endometriosis	1	0.55%
Seizure	1	0.55%
Vericose vein	1	0.55%
Glaucoma	1	0.55%
Osteoarthritis	1	0.55%
Migraine	1	0.55%
Rheumatoid arthritis	1	0.55%
Cataract	1	0.55%

*cancer other than breast cancer

It is reported that being overweight defined is associated with increased risk of breast cancer especially for women after menopause. In this study most of the patients (46.11%) were overweight (Fig. 2). In a study by Piet A. van den Brandt et al showed that body mass index (BMI) showed significant inverse and positive associations with breast cancer among pre and postmenopausal women which is identical to our result. [22]

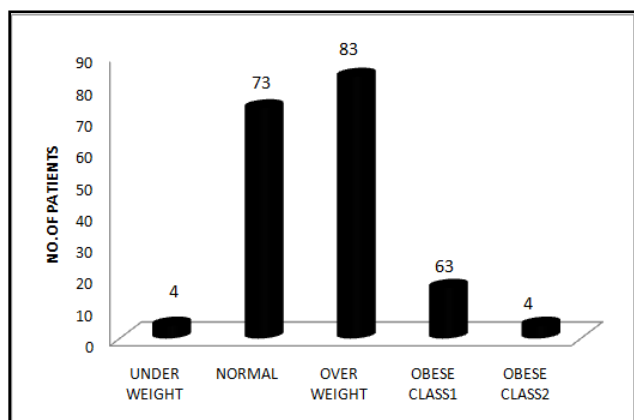


Fig. 2: It shows BMI of the patients

51(28.33%) patients were had their first menarche at the age of 14, 42(23.33%) patients had at the age of 13. Prince Antonio Harrison et al shows menarche less than 11 years showed a beneficial effect in breast cancer. But this study shows less no of patients in the age group of less than 11 (Table 4).

Table 4: It shows Menstruation history of patients

Age	No. of patients	Percentage
≤11	18	10.00%
12	39	21.66%
13	42	23.33%
14	51	28.33%
15	24	13.33%
≥16	6	3.33%

Majority of the patients in this study gave their first child birth at an age of 25 and 12(6.66%) were nulliparous. In the study of risk factors for breast cancer among women attending a tertiary care hospital in southern India by Prince Antonio Harrison et al out of 315 study group about 54.4% of patients had their first child birth at age less than 30 (Table 5). [17] In this study majority patients breast fed for about 2 years ie, 57(31.67%) and 13(7.22%) patients were in not breast fed category (Table 6).

Table 5: It shows Age of first child birth of patients

Age	No. of patients	Percentage
≤20	8	4.44%
21	11	6.11%
22	21	11.66%
23	24	13.33%
24	27	15.0%
25	33	18.33%
26	15	8.33%
27	16	8.88%
28	5	2.77%
29	3	1.66%
≥30	5	2.77%

Chemotherapy treatment uses medicine to weaken and destroy cancer cells in the body including cells at the original cancer site and any cancer cells that may have spread to another part of the body. The most commonly used regimen in this study group was AC (Adriamycin cyclophosphamide). Almost half of the patient (45%) were undergone this regimen. FEC (5 fluorouracil, epirubicin, cyclophosphamide) regimen was used for 32 (17.77%) patients (Table 7).

Table 6: It shows Breast feeding history of patients

Time period (Average)	No. of patients	Percentage
Not breast fed	13	7.22%
<6 months	3	1.66%
6 months	13	7.22%
1 yr	32	17.78%
1.5yr	31	17.22%
2 yr	57	31.67%
2.5 yr	13	7.22%
3 yr	14	7.77%
3.5 yr	2	1.11%
4 yr	2	1.11%

Table 7: It shows Chemotherapeutic regimen prescribed for the patients

Chemotherapy regimen	No. of patients	Percentage
AC-Adriamycin and Cyclophosphamide	81	45%
FEC-Fluorouracil, Epirubicine, Cyclophosphamide	32	17.77%
Paclitaxel	27	15%
Docetaxel	17	19.4%
CAF- Cyclophosphamide, Adriamycin, Fluorouracil	8	4.4%
Transtuzumab	3	1.66%
CMF-Cyclophosphamide, Methotrexate, Fluorouracil	2	1.1%
AD-Adriamycin, Docetaxel	2	1.1%
DC-Docetaxel, Cyclophosphamide	1	0.5%
Carboplatin	1	0.5%
ED- Epirubicine, Docetaxel	1	0.5%
FEM- Fluorouracil, Epirubicine, Methotrexate	1	0.5%

CONCLUSION

In this study 37.77% of patients were in the age group of 51-60. In which 107(59.44%) patients were postmenopausal. Most of them are married (98.33%) and residing in urban area. Coming to the age of menarche of the patients most of them had their menarche in the age of 14(28.33%). Many of the patients were not having a family history of cancer, The largest no. of patients (28.88%) had hypertension as the comorbidity followed by diabetes mellitus.. Majority of patients in the study group were overweight. The result shows many of the patients gave their first child birth at an age of 25 and 12(6.66%) patients were nulliparous. In this study majority patients' breast fed for about 2 years ie, 57(31.67%) and 13(7.22%) patients come under not breast fed category. Regarding the risk factors of the breast cancer use of OCT & HRT are one of the important factor. But in this study shows, only 16.66% patients were undergone hysterectomy. Out of 180 patients only 9(5%) had a history of HRT/OCT use and the rest 171(95%) were not taken any HRT/OCT in the past. Another important objective was to assess the various chemotherapeutic regimens prescribed for breast cancer treatment in this hospital. The mostly used regimen is AC (Adriamycin cyclophosphamide). The goal of early breast cancer detection is to find cancers before they start to cause symptoms. By the early detection for breast cancer thousands of lives can be saved, and that many more lives could be saved if even more women and their health care providers came to know about various preventable risk factors so that they can make necessary changes to avoid in getting breast cancer.

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