Section: General Surgery

Original Research Article

A CLINICO EPIDEMOLOGICAL STUDY OF BREAST CANCER WITH SPECIFIC REFRENCE TO ER/PR POSITIVITY

Kumar Abhishek[1], Ajit Kumar Vidhyarthy[2]

[1]Senior Resident, Department of General Surgery, Atal Bihari Vajpayee institute of Medical Sciences and Dr. RML Hospital, New Delhi, India.
[2]Senior Resident, Department of General Surgery, NMCH, Patna, Bihar, India.

Received : 16/01/2023
Received in revised form : 20/02/2023
Accepted : 05/03/2023

Keywords:
Epidemiological Study, Breast Cancer, Er/Pr Positivity.

Corresponding Author:
Dr. Ajit Kumar Vidhyarthy,
Email: ajitscorpio.444@gmail.com

DOI: 10.47009/jamp.2023.5.2.277

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (2); 1313-1317

Abstract

Background: Epidemiologic data, animal models, and in vitro studies have shown that reproductive hormones, particularly estrogen, play a critical role in breast cancer etiology. Certain established breast cancer risk factors, such as postmenopausal obesity, age at menarche, and use of exogenous hormones, may affect risk by increasing systemic exposure to hormones (2,3,), a view that is consistent with prospective studies directly linking higher circulating levels of estradiol to postmenopausal breast cancer. **Materials and Methods:** Retrospective study in which 20 randomly selected case records of breast cancer patients, who presented in the period between March 2022 to February 2023, and who had undergone surgery, were taken and studied in terms of history, examination, investigations, treatment given, histopathology report and development of recurrence, metastasis and survival. These 20 patients were divided according to ER/PR status in 4 groups that is ER+PR+ / ER+PR- / ER-PR+ / ER-PR-. These 4 groups were compared in terms of breast cancer epidemiology, clinical features, stage, histopathology report, treatment given, and development of recurrence, metastasis and survival duration. **Result:** This is a retrospective study in which 20 randomly selected case records of breast cancer patients. In this study on ER PR receptor in breast carcinoma, 20 cases records of breast cancer patients were taken. In this study 6 patients were <35-year age, 8 patient in between 36 to 45 year, 6 patients in between 46 to 55 years and 10 patient having more than 55 years, so that the maximum number of patients of breast cancer were in age group of 46-55 years and next, more than 49 years in this study. **Conclusion:** Among the patient presenting with breast lump, majority of the patients (80%) were diagnosed to have early invasive breast carcinoma, followed by loco regionally advanced breast carcinoma in this study. Almost all patients of Breast Cancer were having infiltrating ductal carcinoma in this study.

INTRODUCTION

Epidemiologic data, animal models, and in vitro studies have shown that reproductive hormones, particularly estrogen, play a critical role in breast cancer etiology.[1] Certain established breast cancer risk factors, such as postmenopausal obesity, age at menarche, and use of exogenous hormones, may affect risk by increasing systemic exposure to hormones,[2,3] a view that is consistent with prospective studies directly linking higher circulating levels of estradiol to postmenopausal breast cancer.[4,5] In addition to elucidating the systemic effects of hormone-related exposures, progress in breast cancer research will require advances in our understanding of processes that occur within the breast, including hormone synthesis, metabolism, and protein expression.

Despite clinical, pathologic, and molecular evidence that breast cancers are heterogeneous,[6] most epidemiologic research to date has viewed breast cancer as a single disease that is associated with a common set of risk factors. Recent interest has focused on assessing risk factors for breast cancers stratified by pathologic features, with the important goal of revealing associations that might otherwise be diluted or masked in analyses in which breast cancer is considered as a single outcome.

Estrogen receptor (ER) and progesterone receptor (PR) are the most widely studied markers in breast tissue. When compared with hormone receptor–negative tumours, hormone receptor–positive breast cancers exhibit stronger clinical responses to hormonal treatment,[7] better differentiated

ISSN (O): 2687-5365; ISSN (P): 2753-6556

morphologic appearance,[8] and incidence rates that rise continuously with aging rather than slowing after menopause.[9,10] In contrast to many of the established clinical and pathologic distinctions between ER-defined and PR-defined breast cancers, epidemiologic studies that have compared risk factors for receptor-positive and receptor-negative tumors have led to uncertainty and debate.[11] Resolving this controversy will help to clarify whether breast cancers are etiologically heterogeneous. Toward this end, we have critically evaluated published case-control and cohort studies that have compared risk factors for breast cancer, stratified by ER and PR status with two primary goals: (a) to assess existing evidence that risk factors for breast cancers stratified by ER and PR status differ and (b) to highlight aspects of study design, tissue collection, and analysis that should be optimized in future studies. Given the current explosion in tissue biomarker identification and the development and refinement of high-throughput techniques in molecular pathology, identifying approaches that would strengthen future studies is both timely and essential for advancing the field of breast cancer research.

MATERIALS AND METHODS

This study was carried out in the Department of Surgery of a tertiary care hospital. This is a retrospective study in which 20 randomly selected case records of breast cancer patients, who presented in the period between March 2022 to February 2023, and who had undergone surgery, were taken and studied in terms of history, examination, investigations, treatment given, histopathology report and development of recurrence, metastasis and survival. These 20 patients were divided according to ER/PR status in 4 groups that is ER+PR+ / ER+PR- / ER-PR+ / ER-PR-.

These 4 groups were compared in terms of breast cancer epidemiology, clinical features, stage, histopathology report, treatment given, and development of recurrence, metastasis and survival duration.

Inclusion Criteria

All females having carcinoma breast that underwent surgery at least 1 year before, with known hormonal receptor status and who had taken chemotherapy/radiotherapy / hormonal therapy or combined therapy.

Exclusion Criteria

Females age less than 20 years, Females with breast cancer but unknown hormonal receptor status, Females with breast cancer with metastasis.

RESULTS

This is a retrospective study in which 20 randomly selected case records of breast cancer patients.

In this study on ER PR receptor in breast carcinoma, 20 cases records of breast cancer patients were taken. In this study 6 patients were <35-year age,8 patient in between 36 to 45 year, 6 patients in between 46 to 55 years and 10 patient having more than 55 years, so that the maximum number of patients of breast cancer were in age group of 46-55 years and next, more than 49 years in this study.

Table 1: Stage of breast cancer and number of patients.

Stage of carcinoma	Number of patient	Percentage
Early invasive	16	80%
Loco-regionally advanced	4	20%
Metastasis	0	0%
Total	20	100%

Out of 20 patients 9 were in the category of pre – menopausal (45%) and 11 were in the category of post – menopausal (55%).In this study breast carcinoma was more in Postmenopausal female as compared to Premenopausal females.

Table 2: Size of Breast Lump (cm).

Number of patient	Percentage	Size of Breast Lump (cm)
1	65 %	3-5 cm
2	10%	<3cm
5	25%	>5cm

Out of 20 patients 13 (65%) were having breast lump of size 3-5 cm , 2(10%) patients were having breast lump of size <3 cm and 5 (25%) patients were having breast lump of size >5 cm . In this retrospective study majority of the patients of Breast carcinoma were observed in those patients having breast lump size in between 3-5 cm.

In this study, out of 20 patients 14 (70%) patients were having breast lump located in upper outer quadrant of the breast followed by 4(30%) patients having lower inner quadrant. Among the patient presenting with breast lump, majority of the patients (80%) were diagnosed to have early invasive breast carcinoma, followed by loco regionally advanced breast carcinoma in this study [Table 1].

Table 3: Type of breast carcinoma and number of patients.

Type of carcinoma	No. of patients	Percentage
Infilterating ductal carcinoma	20	100%
Other type	0	0%
Total	20	100%

ISSN (O): 2687-5365; ISSN (P): 2753-6556

[Table 3] shows that all patients of Breast Cancer were having infiltrating ductal carcinoma in this study.

Table 4: Histological grade of breast cancer and number of patients.

Histological grade	No. of patients	Percentage
1	1	5%
2	17	85%
3	2	10%
Total	20	100%

[Table 4] shows that out of 20 patients 17(85%) patients were having histological grade 2 carcinoma and 2 (10%) were having histological grade 3 carcinoma and 1 (5%)patients were having histological grade 1 carcinoma. Majority of the patients were having grade 2 carcinoma.

Table 5: Hormonal status and number of patients of breast cancer.

Hormonal status	No. of patients	Percentage
ER/PR (+/+)	10	50%
ER/PR (+/-)	1	5%
ER/PR (-/+)	1	5%
ER/PR (-/-)	8	40%
Total	20	100%

[Table 5] shows trhat out of 20 patients 10 (50%) patients were having hormone receptor positive i.e. ER/PR (+/+) ,1(5%) patients were having hormone receptor ER/PR (+/-), 1(5%) patients were having hormone receptor ER/PR (-/+) and 8 (40%) patients were having hormone receptor ER/PR (-/-). Majority of the patients were having hormone receptor positive i.e. ER/PR(+/+).

Table 6: Herceptin-2neu and number of patients of breast cancer.

Herceptin-2neu	No. of patients	Percentage
Her-2neu (+)	11	55%
Her-2neu (-)	9	45%
Total	20	100%

[Table 6] shows Herceptin-2neu receptor positivity was slightly more in this study.

Table 7: Type of treatment given and number of patients of breast cancer.

Treatment	No. of patients
Chemotherapy	19
Radiotherapy	20
Hormonal therapy	8
Neoadjuvant	3

[Table 7] shows that out of 20 patients 19 patients received chemotherapy, 20 patients received radiotherapy ,8 patients received hormonal therapy according to ER/PR status and 3 patients also received neoadjuvangt therapy for down staging. In this study almost all patients received chemotherapy and radiotherapy after surgery.

Table 8: Metastasis and number of patients of breast cancer.

Metastasis	Number of patient	Percentage
Present	2	10%
Absent	18	90%
Total	20	100%

[Table 8] shows most of the patients did not develop metastasis after treatment in this study.

Table 9: Survival duration and number of patients of breast cancer.

Survival duration	No. of patients	Percentage
Survival >12 months	18	90%
Survival< 12 months	2	10%
Total	20	100%

[Table 9] shows that 18 (90%) patients were having survival more than 12 and 2 (10%) patients were having survival less than 12 months in this study.

DISCUSSION

Breast cancer is one of the most common malignancies among women in most developed and developing countries of the world with nearly a million new cases reported each year. It accounts for nearly 21% of all cancers among women worldwide. As in the rest of the world, India too has been witnessing a surge in the incidence of female breast cancer, and it is now the most common cancer of women in many parts of India.[3]

This is a retrospective study in which 20 randomly selected case records of breast cancer patients, who presented in the period between 20-- to 20--, and

ISSN (O): 2687-5365; ISSN (P): 2753-6556

who had undergone surgery, were taken and studied in terms of history, examination, investigations, treatment given, histopathology report and development of recurrence, metastasis and survival. These 20 patients were divided according to ER/PR status in 4 groups that is ER+PR+ / ER+PR- / ER-PR+ / ER-PR-. These 4 groups were compared in terms of breast cancer epidemiology, clinical features, stage, histopathology report, treatment given, and development of recurrence, metastasis and survival duration.

The mean age at presentation of female breast carcinoma in the present study is 48 years.

Out of 20 patients 9 were in the category of pre – menopausal (45%) and 11 were in the category of post – menopausal (55%).In this study breast carcinoma was more in Postmenopausal female as compared to Premenopausal females.

Out of 20 patients 13 (65%) were having breast lump of size 3-5 cm , 2(10%) patients were having breast lump of size <3 cm and 5 (25%) patients were having breast lump of size >5 cm . In this retrospective study majority of the patients of Breast carcinoma were observed in those patients having breast lump size in between 3-5 cm.

In this study, out of 20 patients 14 (70%) patients were having breast lump located in upper outer quadrant of the breast followed by 4(30%) patients having lower inner quadrant followed by painful lump followed by nipple discharge. Among the patient presenting with breast lump, majority of the patients (80%) were diagnosed to have early invasive breast carcinoma, followed by loco regionally advanced breast carcinoma in this study [Table 1].

Most patients presented in this study were stage II cancer followed by stage III. The reason for late presentation may possibly be due to low socioeconomic status and lack of awareness regarding the disease. There was no significant difference between patients having any stage of cancer according to hormone receptor status. Most of the patients in various studies were having stage 2 and 3 breast cancer.

In this study all patients were having invasive ductal carcinoma-not otherwise specified (NOS) type. Various studies showed that majority of cases of carcinoma breast were Invasive ductal carcinoma-NOS type.[8-11]

Table 4 shows that out of 20 patients 17(85%) patients were having histological grade 2 carcinoma and 2 (10%) were having histological grade 3 carcinoma and 1 (5%)patients were having histological grade 1 carcinoma. Majority of the patients were having grade 2 carcinoma.[12,13]

Our present study [Table 5] shows that out of 20 patients 10 (50%) patients were having hormone receptor positive i.e. ER/PR (+/+) ,1(5%) patients were having hormone receptor ER/PR (+/-), 1(5%) patients were having hormone receptor ER/PR (-/+) and 8 (40%) patients were having hormone receptor ER/PR (-/-). Majority of the patients were having hormone receptor positive i.e. ER/PR (+/+). Various studies show that maximum number of patients were having hormone receptor positive.[14-16]

Our present study shows that out of 20 patients 19 patients received chemotherapy, 20 patients received radiotherapy, 8 patients received hormonal therapy according to ER/PR status and 3 patients also received neoadjuvangt therapy for down staging. In this study almost all patients received chemotherapy and radiotherapy after surgery which indicate similar result done in various studies.[17-20]

However, in patients assessed as responding to therapy a significant difference did occur between these two groups. Patients assessed as responding to therapy with ER-positive tumours had a significant survival advantage over the small number of responding patients with ER-negative Primary tumours.[21,22]

CONCLUSION

Most of the patients of breast cancer in India present a decade earlier as compared to western country. Mean age at diagnosis of breast cancer in western countries is 61 years and in India it is 50 years. Breast cancer is more common in postmenopausal group as compared to premenopausal group. Most patients of breast cancer come with complaint of painless breast lump followed by breast pain and nipple discharge. Most of patients in India are diagnosed when patients have early invasive cancer followed by locally advanced cancer.

Most common type of breast carcinoma is infiltrating ductal carcinoma - NOS. Most patients have lymph node positivity and histological grade 2 in histopathological report. Among the patient presenting with breast lump, majority of the patients (80%) were diagnosed to have early invasive breast carcinoma, followed by loco regionally advanced breast carcinoma in this study. Almost all patients of Breast Cancer were having infiltrating ductal carcinoma in this study.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556