



Literacy and different Stages at diagnosis of Female Breast Cancers: A Retrospective Study from a Regional Cancer Centre

Manigreeva Krishnatreya¹, Amal Chandra Katak¹, Jagannath Dev Sharma², Tapti Kumari¹ and Binita Das¹

¹Department of Hospital Cancer Registry, Dr.B Borooah Cancer Institute, Gopinath Nagar, Guwahati-781016, INDIA

²Department of Pathology, Dr.B Borooah Cancer Institute, Gopinath Nagar, Guwahati-781016, INDIA

Available online at: www.isca.in, www.isca.me

Received 13th March 2014, revised 27th March 2014, accepted 21st April 2014

Abstract

Breast cancer is a malignant disease that occurs in the breast tissues of females and rarely encountered even in males. It is known that females with higher education are likely to have a better survival. The female literacy in Assam is low compared to male literacy rate of 73.1%, which may be attributed to multiple factors prevalent in our society. There is also a perception amongst the public that patients who are educated and qualified are likely to be diagnosed in early Stage breast cancers. In this retrospective study, we had tried to see the various educational levels of female breast cancer patients and correlate their educational levels with the various stages at presentation. Our study has demonstrated that formal education of females may lower the proportion of advanced cancers of breast in our population, but formal education is not alone sufficient for the detection of early breast cancers. Community based participation by non-governmental organizations and others to impart awareness on self breast examination to all women without any biases in regards to their education will be beneficial in our population.

Keywords: Awareness, breast cancers, cancer stages, educational levels, literacy, qualified.

Introduction

Breast cancer is a malignant disease that occurs in the breast tissues of females and rarely encountered even in males. The age adjusted incidence rates for female breast cancer is in the range of 10-22 per one lakh female population in Assam, as reported in different population based cancer registries of Assam¹. In Assam, the female literacy rate is 67.3 %². The female literacy in Assam is low compared to male literacy rate of 73.1%, which may be attributed to prejudices against girl's education, early marriages in girls, economic backwardness in rural community which are main contributors of such scenario in rural India, thus contributing to the overall low literacy in females compared to males in our society. Breast cancer is said to be most common in females of urban India. The 5 year survival rates of patients treated for carcinoma of the breast is dependent on the Stage of diagnosis with a survival of 100% in patients with Stage 0 and Stage I disease³. There are certain additional biological prognostic factors which have an impact on the survival of breast cancer patients undergoing treatment, markers like estrogen receptor, progesterone receptors, and HER-2 Neu expression status⁴. Patients with early breast cancers are the patients who are having Stage I disease at presentation⁵. There is a perception amongst the masses that patients who are educated and qualified are likely to be diagnosed in early Stage breast cancers. In this retrospective study, we had tried to see the various educational levels of female breast cancer patients and correlate the educational levels with the various Stages at presentation.

Material and Methods

The data set on information of female breast cancers in Assam was obtained from the data base of a regional cancer centre in Eastern India. A retrospective study was done for the patient information from the period of 2010 to 2012. Patients whose information was not adequate for educational status and stages at presentation were excluded from the present analysis. Cases of Stage 0 or *in situ* carcinoma are not recorded at our registry. No ethical constraints will arise in this type of a study, as it was a retrospective study only. Strict confidentiality on the patient information was maintained while handling the data sets. The cases of female breast cancers for the present retrospective analysis were diagnosed either by clinical, radiological or cytopathological examination. The data on education and different Stages at presentation were considered for the present analysis. Educational information was collected by trained medical social workers at the time of patient registration at the institute and the staging information was obtained from the case records of the patients. The data on the education was collected according to the level of education proscribed by the National Centre for Disease Informatics and Research, Indian Council of Medical Research. The educational status was then clustered into 4 groups. These are as mentioned below. i. Illiterate: Patients with no educational knowledge for either reading or writing in any language. ii. Literate: Those patients who were capable of reading and/or writing their names in any language. iii. Qualified: Patients who have a primary education, or middle level education or secondary level of education, iv. Highly qualified: Patients with education of college and above.

The staging of breast cancer was done according to the American Joint Committee on Cancer Classification⁶. The information was exported to excel spreadsheet programme from the HBCRDM1.0 (data management software).

Statistical analysis used: Descriptive statistics was used and the results are presented as percentages.

Results and Discussion

Out of 1185 female breast cancer patients registered during the period of January 2010 to December 2012, in 838 (838/1185, 70%) cases of female breast cancer staging information was available. Out of 838 patients, the level of educational

qualification was maintained in 814 (97%) female patients with breast cancers. So, in our analysis, the final data set for analysis was 814 patients only. Out of 814 patients, Illiteracy was seen 33% (270/814), 10% (86/814) were literates, 50% (407/814) were qualified and 6.2% (51/814) patients were highly qualified (figure 1). Majority (56.2%) of the patients was in the qualified or highly qualified group, and illiterates and literates represented 33% and 10.5% of patients with breast cancers respectively.

The breast cancer Stage wise distribution with educational level is shown in table 1.

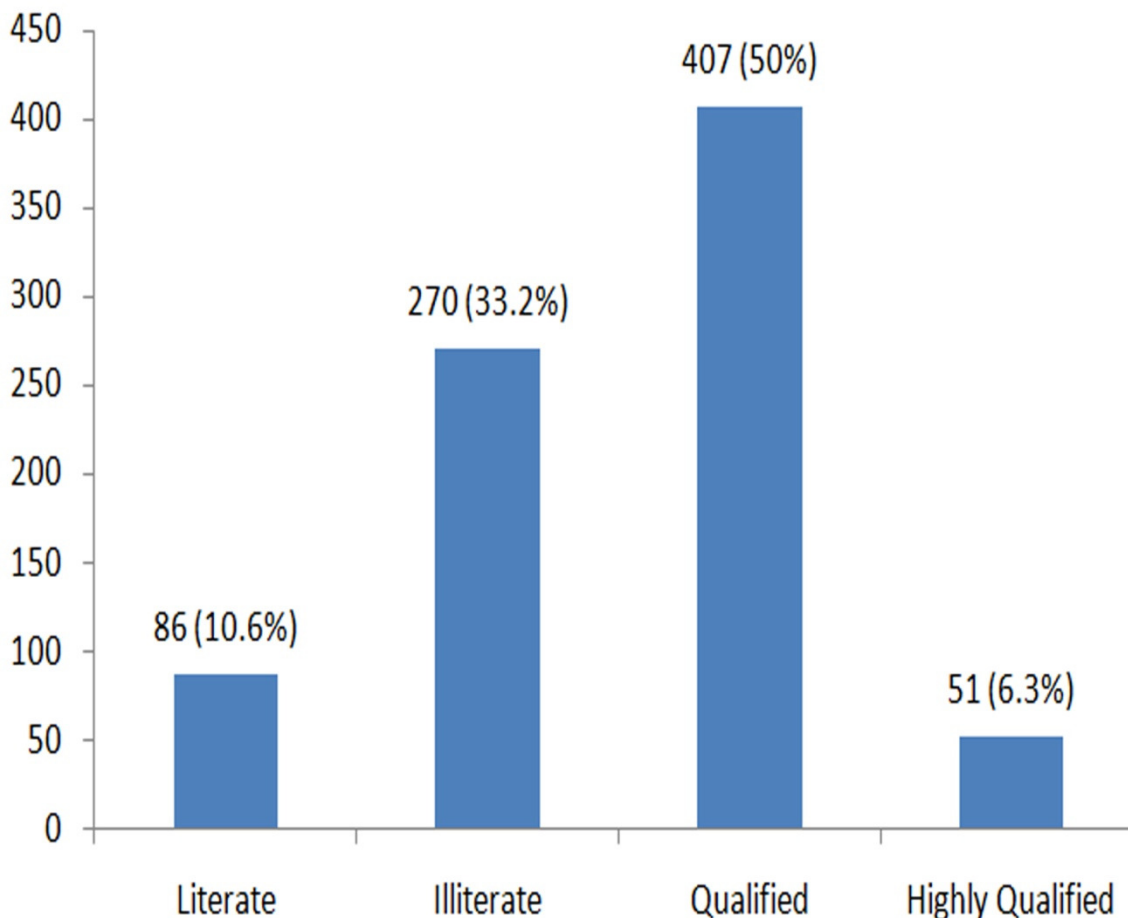


Figure-1
 It shows the different educational levels of females with breast cancers

Table-1
 Table shows levels of education vis-à-vis different cancer stages at presentation

Educational Level	Stage I	Stage II	Stage III	Stage IV
Illiterates	4.8% (13/270)	38.8% (105/270)	36.2% (98/270)	20% (54/270)
Literates	9.3% (8/86)	36% (31/86)	32.5% (28/86)	22% (19/270)
Qualified	5.1% (21/407)	43.4% (177/407)	35.6% (145/407)	15.7% (64/407)
Highly qualified	3.9% (2/51)	56.8% (29/51)	27.4% (14/51)	11.7% (6/51)

Stage distribution in illiterate females with breast cancer: Stage I in 4.8%, Stage II in 38.8%, Stage III in 36.2% and Stage IV in 20%.

Stage distribution in literate females with breast cancer: Stage I in 9.3%, Stage II in 36%, Stage III in 32.5% and Stage IV in 22% of patients.

Stage distribution in qualified females with breast cancer: Stage I in 5.1%, Stage II in 43.4%, Stage III in 35.6% and Stage IV in 15.7% of patients.

Stage distribution in highly qualified females with breast cancer: Stage I in 3.9%, Stage II in 56.8%, Stage III in 27.4% and Stage IV in 11.7% of patients.

Education plays an important role in the life style, parity, and reproductive behavior of females which may play a role as risk factor in the causation of breast cancers in females⁷. In our retrospective analysis, majority (56.2%) of the patients representing both the urban and rural areas were educated. *American Cancer Society* recommends yearly mammography for females over 40 years of age for the early detection of breast cancers. Mammography is a radiological technique used for detecting early lesions or tumors in the breasts. However, in a limited resources country like ours, mammography is economically not feasible for screening purposes. In our analysis, the Stage I disease at presentation in the combined group of illiterate patients and literate patients was around 7%, where as in qualified and highly groups it was 5.1% and 3.9% respectively. This showed that only formal education is not sufficient for early diagnosis of breast cancers and specific information on screening procedures for detection of early breast cancers is more relevant. Currently such awareness programmes on breast cancers has a limited reach amongst the population of our region. For early detection of breast cancers, among others there is a recommendation suggesting emphasis on training of health care providers to conduct clinical breast examination⁸. In a country like ours, where the resources of health care providers are limited self breast examination by the females themselves can be an effective tool and moreover, self breast examination will not lead to embarrassment on the part of the woman of visiting a clinician or health care provider for examination of the breasts. Patients considered being in the locally advanced and advanced breast cancers are those who presents in Stage III or in Stage IV. In our analysis, in the group of illiterate patients, patients who were literate, in the qualified and the highly qualified group, advanced cancers of the breast was seen in 56.2% and 54.5%, 51.3% and 39.1% patients respectively. This trend showed that late or advanced Stage breast cancers were on a decline with higher formal education. A population based study by Hussain *et al* showed an increased survival in patients with higher education and breast cancers, however, the Stages at presentation was not considered in that analysis⁹. Dalton *et al* have demonstrated improve survival in patients diagnosed with early Stage breast cancers¹⁰. There are

very few worldwide population based studies correlating the survival with the Stage at diagnosis and educational levels. This retrospective study can suggests the findings of improvement in the survival in patient with higher educational qualifications could be possibly due to proportionate decrease in cases with advanced Stage at diagnosis which is lower in the qualified patients or patients with higher education as shown in our study. The survival of patients with breast cancers with educational levels and Stages could not be estimated in our retrospective study. There are logistical constraints in carrying out such survival studies, as in our setting the follow-up for survival is mostly an active one and there is a limited role of passive follow-up. The active follow-up methods involve actively pursuing the vital status (dead or alive status) of patients by making telephonic calls to patients or relatives, sending post cards, and finally making home visits to the patient's addresses. The passive method of follow-up involves matching the mortality records with that of patient information's like, name, gender, age, address etc. However, not all deaths (100% deaths) are reported with the office of birth and death registration in India due to illiteracy and poor knowledge about its importance to the masses, and as such the current mortality records will not represent the actual population mortality for carrying out any population based survival studies. A Swedish study has shown that, higher the educational qualification of females of the population, the more likely is to detect localized and *in situ* cancers by mass screening methods like by using mammography¹¹. But, in India, mass screening using mammography is still not done.

Conclusion

This retrospective study has shown that formal education of females may lower the proportion of advanced cancers of breast in our population, but formal education is not alone sufficient for the detection of early breast cancers. Community based participation by non-governmental organizations and others to impart awareness on self breast examination to all women without any biases in regards to their education will be beneficial in our population.

Acknowledgement

The cancer registry at our institute is being financially supported by National Centre for Disease Informatics and Research under Indian Council of Medical Research.

References

1. Three-year Report of Population Based Cancer Registries:2009-2011, NCDIR, ICMR; Bengaluru (2013)
2. Census of India Report, 2011 Available at <http://www.mapsofindia.com/census2011/literacy-rate.html>, Last accessed March 12, (2014)
3. American Cancer Society. *Breast cancer survival rates by Stage*, [Cited serial online] Available at

- www.cancer.org/cancer/breastcancer/detailedguide/breast-cancer-survival-by-Stage (Last accessed on March 12 2014) (2014)
4. Norton N. and Perez E.A., How relevant is hormone receptor status in the context of outcome to HER2-positive breast cancer? *Breast Cancer Res*, **15**, 101 (2013)
 5. Cabanes P.A., Salmon R.J., Vilcoq J.R., Durand J.C., Fourquet A. and Gautier C. *et al.*, Value of axillary dissection in addition to lumpectomy and radiotherapy in early breast cancer, *The Lancet*, **339(8804)**, 1245-48 (1992)
 6. Edge S.B., Fritz A.G., Byrd D.R., Greene F.L., Trotti A., Compton C.C., Editors, Cancer Staging manual, AJCC, 7th edition, Springer; New York (2010)
 7. Bratten T., Weiderpass E., Kumle M., Adami H.O., Lund E., Education and risk of breast cancer in the Norwegian-Swedish women's lifestyle and health cohort study, *Int J Cancer*, **110**, 579–83 (2004)
 8. Leitch A.M., Dodd G.D., Constanza M., Linver M., Pressmen P., McGinnis M. and Smith R.A., American Cancer Society Guidelines for the Early Detection of Breast Cancer: Update 1997, *CA Cancer J Clin.*, **47**, 150-53 (1997)
 9. Hussain S.K., Altieri A., Sundquist J. and Hemminki, Influence of education level on breast cancer risk and survival in Sweden between 1990 and 2004, *Int J Cancer*, **122(1)**, 165-9 (2008)
 10. Dalton S.O., Doring M., Ross L., Carlsen K., Mortensen P.B., Lynch J. and Johansen C., The relation between socioeconomic and demographic factors and tumour Stage in women diagnosed with breast cancer in Denmark, 1983–1999, *Br J Cancer* **95**, 653–9 (2006)
 11. Duffy S.W., Tabar L., Chen H.H., Holmqvist M., Yen M.F. and Abdsalah S *et al.*, The impact of organized mammography service screening on breast carcinoma mortality in seven Swedish counties—a collaborative evaluation, *Cancer*, **95**, 458–69 (2002)