



Risk factor stratification in breast cancer - a tertiary care analysis

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ABSTRACT

Breast cancer is a very common malignancy diagnosed in India and is the most common cancer in women in India. The morbidity and mortality burden of malignancy in India ranks as one of the highest in the world. India has a network of cancer registries, a process which has expanded since the 1960s and has new initiatives such as cancer atlas and online software programs. The burden of breast cancer is on the rise in both developed and developing countries. The objectives were to identify and study the risk factors for breast cancer among women attending Saveetha Medical College and Hospital, Chennai and to study the association between risk factors and breast cancer. The case-control study was conducted on 110 cases and 110 controls. A semi-structured questionnaire was used to collect information. Statistical Analysis was done using MS Excel 2007 and the Chi-Square test was also used. Of the parameters studied, residence, family history, parity, duration of breastfeeding and oral contraceptive use were found to be associated with breast cancer and were statistically significant ($p < 0.05$). The findings suggest that positive family history, nulliparity, duration of breastfeeding and OCP use may have an impact on breast cancer in Indian women. Hence screening and creation of awareness may help in decreasing mortality.



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INTRODUCTION

Malignancy is one of the most significant medical problems worldwide and has become one of the ten driving reasons for death in India (Gupta *et al.*,

2002). It is evaluated that at any point in time, there are almost 2 to 2.5 million instances of malignancy in India. Breast cancer ranks first in the list of cancers among Indian women and is the most commonly diagnosed malignancy in women worldwide (22%) and in India (18.5%). Cancer of the breast is on the rise in both developed and developing nations; the occurrence is high after the age of 50 in developed countries, though in India, it is after the age of 40.

Late marriage and fewer children among women have increased the rate of breast malignancy. In India, the age institutionalized occurrence of breast cancer varies between 9 to 32 for every 1,00,000 ladies. India started the National cancer registry program in 1981 to produce solid information on the pattern and magnitude of the disease. Up to 2003, the program contained six populace based cancer registries and one of them for the rural area

Table 1: Risk Factors for Breast Cancer

Parameter	Cases	Controls	P Value
Age (in years)			0.41
≤39	33	44	
40 – 49	17	12	
50 – 59	52	48	
≥60	8	6	
Mean ± SD	42 ± 10.5	44 ± 9.5	
Median (Range)	43 (25 – 69)	40 (25 – 69)	
Educational Status			0.18
Illiterate	36	34	
Primary	38	29	
Secondary	32	36	
University	4	11	
Residence			<0.05
City	10	18	
Town	22	52	
Village	78	40	
Monthly Family Income (In Rupees)			0.17
1-500	2	6	
500-1000	18	24	
>1000	90	80	
Marital Status			0.21
Married	96	86	
Unmarried	3	2	
Divorced	1	2	
Single	10	20	
BMI			0.45
<18.5	2	1	
18.5 – 24.9	33	44	
25 – 29.9	32	28	
30 – 34.9	43	37	
Family History			<0.05
No	98	108	
Yes	12	2	
Age at Menarche (years)			0.83
≤12	27	22	

Continued on next page

Table 1 continued

Parameter	Cases	Controls	P Value
13	43	48	
14	29	28	
≥15	11	12	
Mean ± SD	13.4	13.6	
Median (Range)	13 (10 - 18)	13 (9 - 19)	
Parity			<0.05
Parous	96	105	
Nulliparous	14	5	
Age at First Full Term Pregnancy (years)			0.30
<20	55	59	
20 - 24	32	31	
25 - 29	12	5	
≥30	11	15	
Mean ± SD	21	19	
Median (Range)	19 (15 - 45)	19 (16 - 35)	
Age at Last Full Term Pregnancy (years)			0.44
≤29	35	38	
30 - 34	22	23	
35 - 39	36	26	
≥40	17	23	
Mean ± SD	50	48	
Median (Range)	50 (36 - 69)	48 (36 - 69)	
Breastfeeding			
Yes	110	110	
No	0	0	
Duration of Breastfeeding			<0.05
< 6 month	99	107	
≥ 6 months	11	3	
Menopausal Status			0.24
Premenopausal	71	79	
Postmenopausal	39	31	
Oral Contraceptive Use			<0.05
No	101	108	
Yes	9	2	

(just 3.5% of the Indian population) (Chakraborty *et al.*, 2001). An expanding pattern in the occurrence of the ailment has been accounted for from different registries and India has now become a nation with one of the biggest assessed number of breast malignancy-associated deaths around the world (Nandakumar *et al.*, 2005). The sources of information on risk factors of cancer, in a country like India, are considerably limited because of its vast population, diverse cultures, geographical variations and various diets and habits. The explanations behind the changing occurrence of breast malignancy among ladies are not completely understood and might be clarified by the conceptive and various ways of lifestyle. The present study endeavors to discover different risk factors of breast cancer among patients of a tertiary care hospital in India.

MATERIALS AND METHODS

The study was directed at Saveetha Medical College and Hospital, Chennai. A sum of 220 people was included according to previous literature. All-female breast cancer patients, who were diagnosed and affirmed by clinical assessment, findings from biopsies and opinions from oncosurgeon were included in the investigation. All the types of histopathologically affirmed instances of breast malignancy, regardless of the degree, between the age of 25 to 69 years and who were diagnosed inside a year from the date of interview, were recruited. Both pre-operative and seven days after post-operative cases who were willing to participate were also included. Patients who were not ready to partake, patients who were ill, male breast malignancy patients, pregnant ladies and ladies with gynecological issues were not included. All the female patients other than breast cancer in the hospital during the interview were taken for the control group. Females who were having any history suggestive of breast cancer or any signs found during the clinical examination were excluded from the study. Ethical clearance was obtained from the Institutional Ethics Committee of Saveetha Medical College and Hospital. Information sheet regarding the study with all relevant information was given to all the participants and written informed consent form was also obtained. It was conducted in collaboration with the Surgery department and department of surgical oncology, Saveetha Medical College & Hospital. By using a semi-structured, pre-tested questionnaire and interview method, the required data was collected. The interview included complete demographic details, general examination, reproductive history, family history, past history, lifestyle and stage at diagnosis. Data entry was done in

MS Excel 2007. Descriptive analysis was done by summarizing categorical variables and results were expressed in percentages and represented in the form of tables. A chi-square test was used to study the association between the risk factors and breast cancer. A p-value of <0.05 was considered as significant.

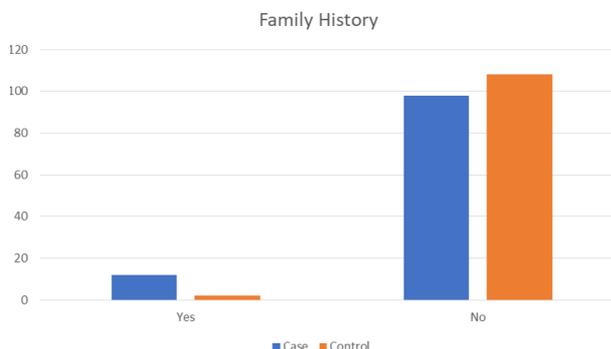


Figure 1: Association of family history with breast cancer

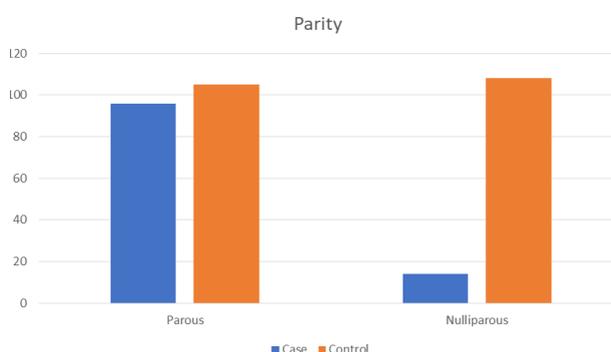


Figure 2: Association of parity with breast cancer

RESULTS AND DISCUSSION

An aggregate of 220 patients was interviewed, 110 ladies with breast malignancy and 110 ladies for the control group. The results of the statistical analysis are shown in Table 1. The mean \pm SD age of cases and controls were found to be 42 ± 10.5 years and 44 ± 9.5 years, respectively. There were no significant differences among the cases and controls concerning the age, income, marital status, BMI, level of education, age at menarche, age at first full-term pregnancy, age at last full-term pregnancy and menopausal status. Among the cases, breast cancer was found to be significantly associated with those who had a family history of the ailment when compared to those who had no family history. The association was found to be significant, as shown in Figure 1 ($p < 0.05$). When compared to those residing in the city, women residing in town and villages had a higher risk for breast malignancy. Those with the

Table 2: Association of the duration of breastfeeding with breast cancer

Association of the duration of breast feeding with breast cancer	Cases	Controls	Total
< 6 months	99	107	206
≥ 6 months	11	3	14
Total	110	110	220

$X^2 = 4.882$; $p = 0.027$

Table 3: Association of oral contraceptive use with breast cancer

Oral Contraceptive Use	Cases	Controls	Total
No	101	108	209
Yes	9	2	11
Total	110	110	220

$X^2 = 4.689$; $p = 0.030$

duration of breastfeeding ≤ 6 months had increased risk of attaining the disease as compared to those who had a duration of breastfeeding for > 6 months and the association was found to be significant, as shown in Table 2 ($p < 0.05$). This was in line with other studies (Harrison *et al.*, 2010). The risk for breast cancer was significantly higher in nulliparous women and those with a history of usage of oral contraceptive pills, as shown in Figure 2 and Table 3, respectively. The finding was found to be similar to other studies (Grabrick, 2000; Ursin *et al.*, 1998). However, the other factors did not display a significant association with breast malignancy. The findings in our study suggest that positive family history of the disease, nulliparity, residence in towns and villages, duration of breastfeeding ≤ 6 months and oral contraceptive pill usage are all risk factors for breast cancer. The patients were found to be relatively young and the above findings are in accordance with most other research studies, thus showing that a positive family history of the disease might be a solid risk factor for breast cancer at a young age (Pharoah *et al.*, 1997). Consequently, training and creating awareness about the advantageous impacts of screening will be useful in controlling breast malignancy. However, the relative high extent of young cases, as seen from the present study may be due to low age at first pregnancy along with a young population structure. It is well known that a higher age at menarche and early first full-term pregnancy are protective in later life. A large portion of the investigation demonstrated that nulliparous ladies were found to have a comparatively greater risk for breast malignancy as contrasted to parous ladies of similar age (Rosner *et al.*, 1994). Different studies have additionally indicated that connections between age, family history of the disease and parity may exist (Andrieu *et al.*, 2000). Moreover, other

investigations have detailed that nulliparity lessens the chance for breast malignancy at a younger age, but increases the risk in the elderly (Lipworth, 1995; Tavani *et al.*, 1999). Among parous ladies, age at full-term pregnancy was found to be statistically insignificant ($p > 0.05$). These discoveries are in accordance with most other studies (Mahajan *et al.*, 2013; Gajalakshmi, 1998) In other investigations, early age at the start of first full-term pregnancy was found to play a protective role with regard to the disease (Ramon *et al.*, 1996; Das *et al.*, 2012).

CONCLUSION

It is essential that all women who have a positive family history of breast cancer should be screened. Breastfeeding should be promoted and oral contraceptive usage should be monitored. There should be awareness spread on the modifiable risk factors of breast cancer. In developing countries, like India, breast cancer causes a heavy toll on the lives of the people and is a leading cause of mortality. Thus, effective screening and rising of awareness can help curb breast cancer. The associations may differ in other parts of the world and require further investigation.

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