Research Article

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RISK FACTORS FOR BREAST CANCER IN SOUTH INDIA: A CASE CONTROL STUDY

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ABSTRACT

Breast cancer is the most common cancer among women globally. The incidence is rising even in developing countries. There seems to be a shift of breast cancer to younger ages making it more aggressive. A variation in the incidence of breast cancer may be due to geographical, racial, genetic and lifestyle and environmental factors. Knowledge and utilization of screening procedures for early diagnosis also contribute to variations in incidence of the disease. The present study was taken up to see the various risk factors associated with breast cancer in south India. A total of 99 women were recruited in the study of which 30 were controls and 69 were cases. Demographic data was collected by using a standard questionnaire and Information regarding age at menarche, menopausal status, age at first child birth, number of children and duration of breast feeding also collected. Information was sought about the lump in the breast like whether the woman noticed the lump, any associated pain in the breast and nipple discharge, and duration of lump till the first consultation and whether there is any family history of breast cancer. Breast cancer was found to occur a decade earlier in patients in South India when compared to the Western countries. It was also seen that literacy status, occupation, marital status, age of menarche and menopause contributed substantially to the occurrence of the disease. It is necessary to look for risk factors from time to time in the population so as not to miss any new or emerging risk factors. Assessing the complete risk factor profile of women is necessary to intervene early and prevent or decrease the incidence of the disease. Also, it would enable to educate and create awareness among women about the disease. It is necessary to teach and motivate women to perform breast self examination (BSE) regularly so that no lump in the breast goes unnoticed. However, the limitations of the present study are its small sample size taken from a hospital. A larger sample extended to the community might give a better generalized picture of breast cancer in the community.

Key words: Breast cancer, risk factors, screening.

INTRODUCTION

Breast cancer is one of the most common cancers in women globally and the incidence is rising even in developing countries like India.[1,2] It accounts for 25-30% of all cancers in women in India. The average age of developing breast cancer has also come down from above 50 years to 30-50 years with a significant number of patients below 35 years of age. [3] This shift of breast cancer to younger ages is seen to make it more aggressive. According to W.H.O, in 2012, an estimated 70218 women died of breast cancer in India, more than any other country in the world.[4] The variation in the incidence of breast cancer may be due to geographical variations, racial, genetic variations, lifestyle factors, environmental factors and socio-economic status. Also, knowledge and utilization of screening procedures like ultrasonography and mammography for early diagnosis and stage at which diagnosis is done along with required levels of care also contribute to the variations in incidence of the disease. Most of the patients are found to be present in stage II or III in India at the time of first diagnosis. The risk factors associated with occurrence of breast cancer seem to be changing and new factors from time to time are found to be associated with it. Changing lifestyles towards the West in recent times is also an important factor for its increase. Though these are established risk factors, region specific information on risk factors available is limited. The present study aims to explore various risk factors associated with breast cancer in women in South India.

MATERIAL AND METHODS

Participants
69 cases of women in different stages of breast cancer and 30 healthy controls were recruited in the present study after collecting voluntary informed consent. Cases were divided into groups based on TNM classification where the number of cases in stage 1 was 15, 21 cases in stage 2 and 33 cases were in stage 3 of breast cancer.

Laboratory setting
The present study was carried out at Department of Radiotherapy, M.N.J Institute of Oncology and Regional cancer center, Hyderabad, Telangana.

Methods
Demographic data was collected by using a standard questionnaire and information regarding age at menarche, menopausal status, age at first child birth, number of children and duration of breast feeding also collected. Information was sought about the lump in the breast like whether the woman noticed the lump, any associated pain in the breast and nipple discharge, and duration of lump till the first consultation and whether there is any family history of breast cancer.

Ethical consideration

The present study was approved by Institutional human ethical committee of M.N.J Institute of Oncology and Regional cancer center (04-08-2014), Hyderabad, Telangana.

Statistical analysis

Data was analyzed by using SPSS version 20.0. Data was expressed in mean±SD and frequency and percentage. P value less than 0.05 was considered as significant.

RESULTS

The mean age of controls was 41.4 years and cases were 49.69 years, which indicates that increasing age may itself be a risk factor for breast cancer. Among the controls (n=22), 8 women (36.36%) were premenopausal and 14 (63.64%) were postmenopausal. Among cases (n=49), 20 women (40.82%) were premenopausal and 29 women (59.18%) were postmenopausal. The difference in mean of ages was significant with p<0.05 (0.0001).

Participants divided on basis of menopausal status were presented in Table 1. Age wise distribution of participants was presented in Table 2. Breast cancer was found to be more in cases who were in their fourth decade of life. Table 3 presents literacy of the participants and percentage of illiterate women was more among cases than controls. Educational level of study participants was presented in Table 4 and overall level of education and literacy was less among cases when compared to controls. Table 5 presents about the occupation of participants. More number of laborers were present among cases indicates that literacy rates were less among the cases. Physical activity levels among cases and controls was presented in Table 6. More individuals following sedentary lifestyle among cases when compared to controls. BMI among cases and control were presented in Table 7 and 8. The number of cases with overweight and obesity levels of BMI were more among postmenopausal cases (19) when compared to premenopausal cases (11) individuals among postmenopausal women were more in cases. The mean BMI among premenopausal cases was not significant as p>0.05 (0.67). Participants from nuclear family were more in both cases and controls (Table 9). The mean age of menarche of controls and cases is statistically significant (p=0.0306). The mean age of menopause and controls was not statistically significant (p=0.2117) (Table 10). The mean age of women among controls at first child birth was 19.15 ± 4.26 years and that of cases was 19.25 ± 4.77 years which was not found to be statistically significant (p=0.9330) (Table 11). The mean total duration of breast feeding among controls and among cases, the p value was 0.548, quite close to significance (Table 12).

Table 1: Groups of women based on menopausal status

Menopausal status	Controls	Stage 1	Stage 2	Stage 3	Stage 4
Pre-menopausal	15	5	7	14	41
Post-menopausal	15	10	14	19	58
Total	30	15	21	33	99

Table 2: Age wise distribution of study participants

Age groups	N cases	%	N controls	%
<30	1	1.45	11	36.67
30-39	11	15.94	1	3.33
40-49	26	37.68	9	1
50-59	17	24.64	5	16.67
60-69	11	15.94	4	13.33
70-79	2	2.9	0	0
80-89	1	1.45	0	0
Total	69		30	

Data was presented in frequency and percentage.

Table 3: Literacy status of cases and controls

Education	Cases N (%)	Controls N (%)
Illiterate	50 (72.46%)	5 (16.67%)
Literate	19 (27.54%)	25 (83.33%)
Total	69	30

Data was presented in frequency and percentage.

Table 4: Educational level of study participants

Education	Cases N	Cases %	Controls N	Controls %
Primary School	12	17.39	3	10
Secondary school	5	7.24	8	26.67
Intermediate	0		5	16.67
Graduate / Degree	2	2.89	6	20
Post graduate	0		3	10
Nil	50	72.46	5	10
Total	69		30	

Data was presented in frequency and percentage.

Table 5: Occupation of study subjects

Occupation	Cases N	Cases %	Controls N	Controls %
Agriculture Labourer	29	42.02	2	6.67
Homemaker	38	55.07	17	56.67
Professional	2	2.9	6	20
Others	0	0	5	16.67
Total	69	-	30	-

Data was presented in frequency and percentage.

Table 6: Physical activity levels among cases and controls

Level of Physical activity	N cases	% cases	N controls	% controls
Heavy	4	5.79	0	0
Moderate	39	56.52	26	86.67
Sedantary	26	37.68	4	13.33
Total	69		30	

Data was presented in frequency and percentage.

Table 7: BMI among cases and controls

BMI	Cut-off	cases	%	controls	%
Underweight	<18.5	8	11.59	1	3.33
Normal	18.5-24.9	24	34.78	11	36.67
Overweight	>25	20	28.98	8	26.67
Obese	>30	7	10.14	8	26.67

Data was presented in frequency and percentage.

Table 8: BMI as per menopausal status

Menopausal status	Premenopausal		Postmenopausal	
BMI range	Control	Cases	controls	cases
<18.5	1	3	0	7
18.5-24.9	6	12	5	17
>25	4	6	5	16
>30	3	5	5	3

Table 9: Type of family among cases and controls

Type of Family	Cases		Controls	
Joint	24	(34.78%)	8	(26.67%)
Nuclear	45	(65.22%)	22	(73.33%)

Data was presented in frequency and percentage.

Table 10: Age of menarche of cases and controls

Menstrual history	Age of Menarche		Age of Menopause		Not attained menopause / No information available
	< 12	> 12	< 50	> 50	
Cases	36 (52.17%)	33 (47.82%)	38 (55.07%)	5 (7.24%)	26 (37.68%)
Controls	12 (40%)	18 (60%)	12 (40%)	3 (10%)	15 (50%)

Data was presented in frequency and percentage.

Table 11: Age at birth of 1st child in cases and controls

Age at birth of 1st child	Cases	Controls
< 18 yrs	35	11
> 18 yrs	33	9
NA	1	10

Data was presented in frequency and percentage.

Table 12: Duration of breast feeding in cases and controls

Breast feeding Duration	Cases	Controls
< 1 year	1 (1.45%)	2 (6.67%)
1-3	16(23.19%)	8 (26.67%)
4-6	23(33.33%)	7 (23.33%)
>7 yrs	25(36.23%)	3 (10%)
NA	4 (0.9%)	10 (33.33%)
Total	69	30

Data was presented in frequency and percentage.

DISCUSSION

Our study agrees with earlier studies as we have observed that age is an independent risk factor for breast cancer and the incidence is found to be more in the fourth decade of life in the present study. [5-16, 28] Occurrence of breast cancer reflects on the literacy status of women too which is also seen in previous studies. [27] The level of education in cases was less when compared to controls, which indicates that education and literacy play an important in the occurrence of breast cancer as education women would be more aware of the disease and its prevention aspects. This is in accordance with previous studies. [17] Level of education of a woman determines several lifestyle and behavioral factors that may affect the risk of occurrence of breast cancer.

Several factors like diet, physical activity, age at first child birth,[17-22] may be influenced by the level of education as also utilization of screening programmes. [23-26]

In the present study we have observed a positive correlation between levels of education and occupation and occurrence of breast cancer which was high among uneducated, illiterate women who engaged in manual labour. The study shows that in lower socioeconomic strata the incidence of the disease may be higher which agrees with earlier studies. [23] The number of women living as nuclear families is also high in cases than controls. This leads to difficulty in assessing and identifying any mutations associated with breast cancer in the family. Women who attained menarche early and those who has late menopause were found to be more among cases indicating that both events are related to occurrence of breast cancer probably due to exposure to hormone estrogen for a longer duration and high estrogen levels are found to be associated with breast cancer.

The present study indicates the risk of developing obesity among such individuals which can further contribute to the occurrence of breast cancer and Body mass Index (BMI) also found to be higher. No relation was found between breast cancer and breast feeding. 9 women out of cases and 1 among controls had a family history showing that having a positive family history for breast cancer increases the risk of getting the disease. Women with less than 2 children were more among cases than controls. Parity is associated with breast cancer, null parity with increased risk of occurrence of breast cancer. Assessing the complete risk factor profile of women is necessary to intervene early and prevent or decrease the incidence of the disease. Also, it would enable to educate and create awareness among women about the disease. It is also necessary to teach and motivate women to perform breast self examination (BSE) regularly so that no lump in the breast goes unnoticed.

CONCLUSION

Assessing the complete risk factor profile of women is necessary to intervene early and prevent or decrease the incidence of the disease. Also, it would enable to educate and create awareness among women about the disease. It is necessary to teach and motivate women to perform breast self examination (BSE) regularly so that no lump in the breast goes unnoticed. However, the limitations of the present study are its small sample size taken from a hospital. A larger sample extended to the community might give a better generalized picture of breast cancer in the community

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