

A Study on Risk Factors of Breast Cancer Among Patients Attending the Tertiary Care Hospital, in Udupi District

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ABSTRACT

Background: Cancer has become one of the ten leading causes of death in India. Breast cancer is the most common diagnosed malignancy in India, it ranks second to cervical cancer. An increasing trend in incidence is reported from various registries of national cancer registry project and now India is a country with largest estimated number of breast cancer deaths worldwide. **Aim:** To study the factors associated with breast cancer. **Objectives:** To study the association between breast cancer and selected exposure variables and to identify risk factors for breast cancer. **Materials and Methods:** A hospital based Case control study was conducted at Shirdi Sai Baba Cancer Hospital and Research Center, Manipal, Udupi District. **Results:** Total 188 participants were included in the study, 94 cases and 94 controls. All the study participants were between 25 to 69 years of age group. The cases and controls were matched by ± 2 years age range. Non vegetarian diet was one of the important risk factors (OR 2.80, CI 1.15-6.81). More than 7 to 12 years of education (OR 4.84 CI 1.51-15.46) had 4.84 times risk of breast cancer as compared with illiterate women. **Conclusion:** The study suggests that non vegetarian diet is the important risk factor for Breast Cancer and the risk of Breast Cancer is more in educated women as compared with the illiterate women. **Limitation:** This is a Hospital based study so generalisability of the findings could be limited.

Keywords: Breast cancer, risk factors, menarche, diet, abortion

Introduction

Cancer is one of the major health issues worldwide. At global level it accounted for 11.4 million new cases and 7.4 million deaths (around 13% of all deaths) in 2004.⁽¹⁾ Cancer incidence in South East Asia region was 1.7 million in 2004.⁽²⁾

Cancer has become one of the ten leading causes of death in India.⁽³⁾ It is estimated that there are nearly 2 to 2.5 million cancer cases at any given point of time in India.⁽⁴⁾ Over 7 to 9 lakh new cases and 3 lakh deaths occur annually in

India due to cancer,⁽⁵⁾ whereas in Karnataka there are about 1.5 lakh prevalent cases of cancer and about 35,000 new cases are added to this every year.⁽⁶⁾ Based on the consolidated report of cancer registries the overall common cancer sites in South India are stomach for males and cervix for females.⁽⁷⁻⁹⁾

Breast cancer is the most common diagnosed malignancy in women worldwide (22%) and in India (18.5%) it ranks second to cervical cancer. The burden of breast cancer is increasing in both developed and developing countries; the peak occurrence of breast cancer in developed countries is above the age of 50 whereas in India it is above the age of 40.⁽¹⁰⁾ In India the age standardized incidence rate of breast cancer varies between 9 to 32 per 1,00,000 women. To generate the reliable data on magnitude and pattern of cancer, India started National cancer registry program in 1981.⁽¹¹⁾ Upto 2003 the program comprised of six population based cancer registry and one registry serving rural area covering the

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total population of 35.7 million (only 3.5% of the Indian total population)⁽¹²⁾ and an increasing trend in incidence is reported from various registries of national cancer registry project and now India is a country with largest estimated number of breast cancer deaths worldwide.^(13,14)

For a country like India with a huge population, diverse cultures, geographical variations, diets and habits, sources of information on cancer risk factors are considerably limited. The reasons for varying incidence of breast cancer among women are not fully understood, which are likely to be explained by reproductive and lifestyle factors such as Literacy, Diet, Age at menarche and menopause, Age at first delivery, Abortion, Family history of Breast Cancer.⁽¹⁵⁻²⁴⁾

The present study attempts to find out some of the various risk factors of Breast Cancer among patients attending the tertiary care hospital in Udupi District.

Materials and Methods

The case control study was conducted at Shirdi Sai Baba Cancer Hospital and Research Center, Manipal, Udupi District. Delayed age at first delivery was considered as a risk factor⁽²⁴⁾ with an exposure of 30% in control group and an anticipated OR of 2 for a power of 80% and 5% level of significance the calculated number of cases was 94. For 1:1 allocation ratio the required number of controls was 94, hence total 188 individuals were included in the study. All type of histopathologically confirmed cases of breast cancer irrespective of their degree, between the age group 25 to 69 years were included in the study as cases and ± 2 years age matched individuals; patients other than breast cancer in the hospital were selected as controls. Patients, who were not willing to participate in study, or those cases who were seriously ill and male breast cancer patients were excluded from the study. First degree relatives of cases, controls having personal history of breast disease, pregnant

women, and women with gynecological problems were excluded from the study. The cases and controls were personally interviewed by investigator using a structured questionnaire. The study participants were informed about the purpose, method and possible discomforts related with the study and written consent was obtained. Due clearance was obtained from Institutional ethics committee and hospital Administration. Data analysis was done using statistical package for social sciences software and stata software. The data is summarized in the form of tables. Univariate Conditional Logistic Regression analysis was used to evaluate the significant factors associated with breast cancer. Multivariate Analysis was used to calculate the adjusted Odds Ratio with 95% CI.

Results

Total 188 participants were studied 94 were cases and 94 were controls. The cases and controls were selected from Shirdi Sai Baba Cancer Hospital, Manipal. The participants were interviewed with the help of a structured questionnaire and the information regarding age, religion, education, residence, diet, and history of breast cancer in family, reproductive factors, family planning and habits were obtained. All the study participants were between 25 to 69 years of age group. The cases and controls were matched by ± 2 years age range. The maximum cases (21.3%) were between 50 to 54 years of age group. The mean age of the cases was 45.64 years (SD 9.336) and that of controls was 44.9 years (SD 9.446). Most of the cases and controls belonged to Hindu Religion. The cases had a better education as compared with the controls. The study population included the participants from urban and rural areas of 15 different districts. Udupi district had the maximum number of cases (43.6%). Univariate conditional Logistic Regression Analysis was done to evaluate the factors significantly associated with breast cancer. Table 1 reports the results of Univariate

Table 1: Univariate conditional logistic regression for socio-demographic variables, diet and family history

Variables	Groups	Cases N (%)	Controls N	Unadjusted OR (CI)	P value
Education	Illiterate	18 (19.1)	35 (37.2)	Reference	
	1 to 7 years	29 (30.9)	27 (28.7)	2.07 (0.91-4.67)	0.08
	>7-12 years	34 (36.2)	23 (24.5)	2.95 (1.29-6.77)	0.01*
	Graduate and above	13 (13.8)	9 (9.6)	3.01 (0.95-9.50)	0.06
	Total	94 (100)	94 (100)		
Monthly family income	<=5000	42 (54.5)	51 (56.7)	Reference	
	>5000 to 15000	28 (36.4)	29 (32.2)	1.55 (0.66-3.63)	0.30
	>15000	7 (9.1)	10 (11.1)	1.63 (0.54-4.90)	0.38
	Total	77 (100)	90 (100)		
Diet	Vegetarian	31 (33)	46 (48.9)	Reference	
	Non vegetarian	63 (67)	48 (51.1)	1.93 (1.05-3.54)	0.03*
	Total	94 (100)	94 (100)		
Family History of Breast Cancer	Yes	5 (5.3)	3 (3.2)	1.66 (0.40-6.97)	0.48
	No	89 (94.7)	91 (96.8)	Reference	
	Total	94 (100)	94 (100)		

*P<0.05

conditional logistic regression for exposure variables education monthly income, Diet and Family History with breast cancer. More than seven to twelve years of education was observed as a significant risk factor and the non vegetarian diet was also observed an important risk factor. The unadjusted risk of breast cancer was more among the women who had non vegetarian diet (OR 1.93, CI 1.05- 3.44) as compared with the vegetarian women. Table 2 reports the results of univariate conditional logistic

regression for reproductive factors. Age at menarche, age at first child birth and abortion reported significant risk for breast cancer. Use of Oral contraceptive pills did not report any significant risk in present study population. In this study habits of pan chewing, tobacco chewing, arecanut chewing and snuffs use were not significantly associated with breast cancer risk. Table 3 reports the adjusted Odds Ratio of the variables which reported significant risk for Breast Cancer in univariate analysis.

Table 2: Conditional logistic regression for reproductive factors

Variables	Groups	Cases N (%)	Controls N (%)	Unadjusted OR (CI)	P value
Age at menarche	<=13	35 (37.2)	50 (53.2)	Reference	
	>13	59 (62.8)	44 (46.8)	2.15 (1.11-4.15)	0.02*
	Total	94 (100)	94 (100)		
Age at marriage	<=30 years	86 (93.5)	92 (97.9)	Reference	
	>30 years	6 (6.5)	2 (2.1)	3 (0.60-14.83)	0.17
	Total	92 (100)	94 (100)		
Parity	Nulliparous	7 (7.6)	7 (7.4)	1.16 (0.40-3.48)	0.78
	Parous	85 (92.4)	87 (92.6)	Reference	
	Total	92 (100)	94 (100)		
Number of children	Nulliparous	7 (7.6)	7 (7.4)	Reference	
	<=2 child	58 (63.0)	39 (41.5)	1.57 (0.47-5.25)	0.45
	>2children	27 (29.3)	48 (51.1)	0.40 (0.11-1.39)	0.15
	Total	92 (100)	94 (100)		
Age at first child birth	<=20 years	21 (25.6)	34 (39.1)	Reference	
	21 to 30 years	52 (60.5)	48 (55.2)	1.88 (0.93-3.80)	0.07
	>30 years	12 (14.0)	5 (5.7)	4.18 (1.13-15.41)	0.03*
	Total	85 (100)	87 (100)		
Abortion	No	69 (75.5)	77 (81.9)	Reference	
	Natural	9 (9.6)	13 (13.8)	0.85 (0.32-2.05)	0.66
	Induced	14 (14.9)	4 (4.3)	5.75 (1.27-25.99)	0.02*
	Total	92 (100)	94 (100)		
Menopausal status	Premenopausal	35 (37.2)	43 (45.7)	1.66 (0.81-3.40)	0.16
	Postmenopausal	59 (62.8)	51 (54.3)	Reference	
	Total	94 (100)	94 (100)		
Oral contraceptive pills use	No	86 (93.6)	93 (98.9)	Reference	
	Yes	6 (6.4)	1 (1.1)	5.99 (0.72-49.83)	0.09
	Total	92 (100)	94 (100)		

*P<0.05

Table 3: Adjusted odds ratio of factors associated with breast cancer risk

Variables	Groups	Cases N (%)	Controls N (%)	Unadjusted OR (CI)	Adjusted OR (CI)	P value
Education	Illiterate	18 (19.1)	35 (37.2)	Reference	Reference	
	1 to 7 years	29 (30.9)	27 (28.7)	2.07 (0.91-4.67)	2.18 (0.78-6.14)	0.13
	>7-12 years	34 (36.2)	23 (24.5)	2.95 (1.29-6.77)	4.84 (1.51-15.46)	0.008*
	Graduate and above	13 (13.8)	9 (9.6)	3.01 (0.95-9.50)	3.44 (0.62-19.15)	0.15
Diet	Vegetarian	31 (33)	46 (48.9)	Reference	Reference	
	Non vegetarian	63 (67)	48 (51.1)	1.93 (1.05-3.54)	2.80 (1.15-6.81)	0.02*
Age at menarche	<=13	35 (37.2)	50 (53.2)	Reference	Reference	
	>13	59 (62.8)	44 (46.8)	2.15 (1.11-4.15)	1.59 (1.62-4.09)	0.33
Age at first child birth	<20 years	21 (25.6)	34 (39.1)	Reference	Reference	
	21 to 30 years	52 (60.5)	48 (55.2)	1.88 (0.93-3.80)	1.53 (0.64-3.65)	0.33
	>30 years	12 (14.0)	5 (5.7)	4.18 (1.13-15.41)	1.76 (0.36-8.55)	0.48
Abortion	No	69 (75.5)	77 (81.9)	Reference		
	Natural	9 (9.6)	13 (13.8)	0.85 (0.32-2.05)	0.73 (0.21-2.54)	0.62
	Induced	14 (14.9)	4 (4.3)	5.75 (1.27-25.99)	6.38 (0.99-40.81)	0.05

*P value<0.05

The women with more than 7 to 12 years of education had 4.84 times risk of breast cancer (OR 4.84 CI 1.51-15.46) as compared with the illiterate women. The adjusted risk of breast cancer was more among the women who had non vegetarian diet (OR 2.80, CI 1.15-6.81) as compared with the vegetarian women.

Discussion

The present study conducted at Shirdi Sai Baba Cancer Hospital Manipal, included 94 breast cancer cases and 94 control subjects. The cases and controls were between 25 to 69 years of age. Ozmen, *et al.*, conducted a similar study with the cases and controls between 18 to 70 years of age.⁽²⁵⁾ Ahmed, *et al.*, conducted a similar study with study population between 20 to 65 years age group.⁽²⁶⁾ In the present study maximum numbers of subjects (21.3%) were observed between 50 to 54 years of age group. The average age of the cases was 45.64 years (SD 9.336) and that of controls was 44.9 years (SD 9.446), similar findings were noted in the study conducted by Meshram *et al.*, the study reported most of the patients between 40 to 49 years of age with the average age of 48.4 years for cases.⁽¹⁵⁾ Abbasi, *et al.*, reported average age of cancer cases 47.49 years in a similar study conducted Iran.⁽²⁷⁾

The present study reported 34% of the cases with less than age 40 years. In the present study no case or control reported the habits of smoking or drinking, Pakseresht, *et al.*, reported the similar findings in the study conducted in delhi.⁽¹⁸⁾

The study reported significant unadjusted risk of breast cancer for the women with education between more than 7 to 12 years, non vegetarian diet, age at menarche more than 13 years, age at first child birth more than 30 years and induced abortion ($P < 0.05$). The study conducted by Abbasi, *et al.*, reported significant association between age at menarche and breast cancer.⁽²⁷⁾ The study done by Gajalakshmi, *et al.*, reported that higher education is associated with increased risk of breast cancer.⁽²⁰⁾ The study conducted by Rai, *et al.*, reported that education and socio-economic status of the cases was higher as compared to cases, the study reported significant association between abortion and breast cancer.⁽²⁸⁾

The present study showed an increased adjusted risk of breast cancer with increase in education (>7 to 12 years). This may be because of better awareness of educated women regarding detecting the Breast Cancer or may be due to education brings about the lifestyle changes such as late age of marriage, late age at child birth which are not incremented in the study. Similar finding was reported by Gajalakshmi, *et al.*, in a multicentric

case control study in both premenopausal (>12 years education OR 1.52 CI 1.09-2.13) and postmenopausal women (>12 year education OR 2.46 CI 1.46-4.13).⁽²⁰⁾

The non vegetarian diet was observed an important risk factor. The adjusted risk of breast cancer was more among the women who had non vegetarian diet (OR 2.80, CI 1.15-6.81) as compared with the vegetarian women. A similar study conducted by Harrison *et al.*, noted that diet was significantly associated with breast cancer.⁽²⁹⁾ The Risk level for non-vegetarian diet was higher than vegetarian diet because non vegetarians consume more fat than vegetarians and a diet with a high animal fat intake has been shown to increase the risk of breast cancer.⁽²¹⁾ Hence education and awareness about the beneficial effects of consuming fresh vegetables and fruits will be helpful in controlling Breast Cancer.

Conclusion

The study results are in accordance with the results of previous investigations on risk factors of Breast Cancer. Breast Cancer occurs a decade earlier in Indian Women as compared with the women of developed countries and is a leading cause of mortality in developing countries like India so raising awareness about the screening procedure and treatment of Breast cancer can help reducing mortality.

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