

Breastfeeding Reduces Breast Cancer Risk: A Case-Control Study in North India

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ABSTRACT

Background: Worldwide, breast cancer is the most common cancer among women. In India and other developing countries, breast carcinoma ranks second only to cervical carcinoma among women. Although studies have been done globally, to find the association between breastfeeding and breast cancer, very few studies in India document such a benefit.

Methods: A case-control study was done from August 2009 to July 2010 in the wards of General Surgery and Oncosurgery at Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India. A total of 128 histopathologically confirmed new cases of breast cancer during the study period were taken as cases. Equal numbers of controls were selected by simple random sampling. Controls were matched for age with a range of ± 2 years. Subjects were interviewed using a pretested questionnaire after obtaining written informed consent. The categorical data were analyzed statistically using the Chi-square test and odds ratio with a 95% confidence interval. Continuous variables were analyzed using an independent *t*-test. All the analysis was done using SPSS, version 17.

Results: The age group of the cases was 25-78 years, while that of the controls was 24-79 years. The proportions of cases (56.3%) and controls (63.3%) living in rural areas were more than those living in urban areas. A significant association of breast cancer cases was found with caste, age at marriage, age at the first pregnancy, number of live births, and lifetime duration of breastfeeding.

Conclusions: Breastfeeding has a significant role in reducing breast cancer, and so information, education, and communication activities for the promotion of breastfeeding and creating awareness about this fatal disease are the need of the hour.

Keywords: Breast cancer, breastfeeding, case-control

INTRODUCTION

Worldwide, breast cancer is the most common cancer among women. It is probably the most feared cancer in women because of its psychological impacts. It affects the perception of sexuality and self-image to a degree far greater than any other cancer. Breast cancer is most curable when detected in its early stages.

Breast cancer is becoming the number one killer in females. Therefore, it has become an increasingly important problem of research all over the world. Globally, every 3 min a woman is diagnosed with breast cancer, amounting to 1 million cases annually. According to World Cancer Report, the incidence could go up by 50% to 1.5 million by 2020.^[1]

In India and other developing countries, breast carcinoma ranks second only to cervical carcinoma among women. The increase in the breast cancer cases is mainly being documented in the metropolitan cities; but these data are not totally reliable as many cases in the rural areas go unnoticed.^[2] At present, India reports around 100,000 new cases annually. According to a study by International Agency for Research on Cancer (IARC), there will be approximately 250,000 new cases of breast cancer in India by 2015.^[1] While we generally focus on the positive benefits of breastfeeding for the infants, but are there any additional benefits for the mother as well? Although many studies have been done globally, to find an association between breastfeeding and breast cancer, very few studies in India document such a benefit. So the following study was done to find out the association between breastfeeding and breast cancer.

METHODS

Study Population

The study setting was the tertiary care institute of Haryana which is situated in Northern India. Eligible cases were all the histopathologically confirmed new female breast cancer patients admitted to the oncosurgery ward of the hospital from August 2009 to July 2010. They were included in the order of their admission into the hospital during the study period. Thus, a total of 128 female breast cancer patients were included in the study. Wards were visited and any new cases were included in the study, after explaining the objectives of the study to the subject.

The controls were age matched and within a 2-year age range to cases. Controls were selected from the indoor female patients admitted for wide-spectrum general surgical procedures in the General Surgery ward without having any type of cancer. Controls were selected by simple

random sampling using a lottery method. The case-to-control ratio was 1:1. Study subjects were interviewed personally and the information was recorded in the semistructured pretested pro forma. Women were labeled as menopausal if they had not menstruated during the past six months before the date of data collection. Written consent was taken from all the study subjects. The categorical data were analyzed statistically using the Chi-square test and odds ratio with a 95% confidence interval. All the analyses were performed with Statistical Package for Social Sciences (SPSS), version 17.

RESULTS

Socio-demographic variables are shown in Table 1; the age group of the cases was 25-78 years, while that of the controls was 24-79 years. Majority of cases and controls were in the age group of 45-60 years, followed by 30- to 45-year age group. The proportions of cases (56.3%) and controls (63.3%) living in rural areas were more than those living in urban areas, but the difference found was statistically insignificant (P value 0.251; Table 1).

In maximum cases (54.7%), the age at marriage was 15-20 years, followed by the <15-year age group. In the control group, maximum subjects married before 15 years (50.8%) of age, 41.4% between 15 and 20 years, and only 7.8% after 20 years of age. Women who got married before 15 years of age had a decreased risk (OR 0.466, 95% CI 0.274-0.793), while an increased risk was found among those who got married

Table 1: Distribution of the study population by demographic variables

	Cases	Controls	Odds ratio	95% CI	χ^2 value, P value
Age (years)					
<30	09 (7.0)	12 (9.4)	Matched		
30-45	33 (25.8)	31 (24.2)			
45-60	63 (49.2)	57 (44.5)			
>60	23 (18.0)	28 (21.9)			
Residence					
Urban	56 (43.8)	47 (36.7)	1.340		
Rural	72 (56.3)	81 (63.3)	1	0.812-2.212	1.316, 0.251

The figures in parentheses are in percentages, CI=Confidence interval

after 20 years (OR 1.363, 95% CI 0.582-3.193), as compared to the women who got married between 15 and 20 years of age. The difference was found to be statistically significant (P value 0.005). In majority of cases, the age at the first pregnancy was 20-25 years, while majority of controls had their first pregnancy before 20 years. The risk of breast carcinoma was less in females who had their first pregnancy before 20 years, and more in cases who conceived for the first time after 25 years, when compared with subjects of the 20- to 25-year age group. The difference found in age at the first pregnancy was statistically significant ($P < 0.0001$). The risk of developing breast carcinoma was higher among females with less than or equal to two children, as compared to females who had three to four children. The difference regarding the number of children was statistically significant ($P \leq 0.001$). In majority of the cases and controls, the total duration of breastfeeding, with respect to the number of children, was more than 6 years. A total of 3.9% cases and 3.1% of the controls did not breastfeed their children at all. The risk of developing carcinoma decreased as the total duration of breastfeeding increased (OR for breastfeeding <3 years vs. 3-6 years = 0.452, 95% CI = 0.170-1.201; OR for

breastfeeding <3 years vs. >6 years = 0.301, 95% CI = 0.118-0.767; Table 2).

The mean age of cases was 49.98 ± 11.6 years and the mean age of controls was 49.54 ± 12.0 years; cases and controls were matched for the age at diagnosis with a range of 2 years. Cases and controls differed significantly by age at marriage ($P < 0.0001$, 95% CI 0.772-2.39) and age at first child birth (P value 0.018, 95% CI 0.195-2.10) [Table 3].

To examine how the prevalence of reproductive factors changed for women born in earlier and later decades, we grouped healthy controls into four birth cohorts as shown in Table 4. The average age at marriage decreased over time from 72% before age 15 years for women born before 1955, compared with 46% for those born after 1975. Similarly, the age at first child birth decreased over the time from 60% (before 20 years for women borne before 1955) compared with 48.6% for those borne after 1975. Although there is a decreasing trend in the early age at marriage and early age at first child birth, but statistically, it is not significant ($P > 0.05$). There is a decreasing trend in total live births and total duration of breastfeeding in women borne after 1975 as compared to those born between 1945

Table 2: Selected characteristics of the study population

	Cases	Controls	Odds ratio	95% CI	χ^2 value, P -value
Age at marriage (years)					
<15	40 (31.3)	65 (50.8)	0.466	0.274-0.793	10.58, 0.005*
15-20	70 (54.7)	53 (41.4)	1		
>20	18 (14.1)	10 (7.8)	1.363	0.582-3.193	
Age at first pregnancy (years)					
No child	4 (3.1)	0 (0.0)			26.66, <0.0001*
<20	34 (26.6)	73 (57.0)	0.285	0.167-0.486	
20-25	85 (66.4)	52 (40.6)	1		
>25	5 (3.9)	3 (2.3)	1.020	0.234-4.445	
No. of children					
No children	4 (3.1)	0 (0.0)			16.79, <0.001*
≤ 2 Children	44 (34.4)	28 (21.9)	2.643	1.446-4.831	
3-4 Children	44 (34.4)	74 (57.8)	1		
≥ 5 Children	36 (28.1)	26 (20.3)	2.329	1.243-4.361	
Total duration of breastfeeding (years)					
<2	11 (8.6)	8 (6.3)	0.740	0.258-2.124	
2-5	39 (30.5)	21 (16.4)	1		
5-10	59 (46.1)	65 (50.8)	0.489	0.259-0.924	10.40, 0.015*
>10	19 (14.8)	34 (26.6)	0.301	0.139-0.651	

Figures in parentheses are in percentages., *Significant values, CI=Confidence interval

and 1955. This decrease in trends is statistically significant ($P < 0.05$; Table 4).

DISCUSSION

This study demonstrates that the reproductive factors play an important role in breast cancer etiology among indigenous Indian women. We found that the age at marriage, at first child birth, parity, and breastfeeding were significant predictors.

The present study showed that women who got married before 15 years of age have decreased risk of breast cancer (OR 0.466, 95% CI 0.274-0.793) as compared to women who got married after 20 years (OR 1.363, 95% CI 0.582-3.193). The findings were similar to other studies.^[3,4] Ebrahimi *et al.* and Rosner *et al.* in their studies found that single and nulliparous married women were found to have increased risk for breast cancer as compared with parous women of the same age.^[5,6] Marital status by itself may not be a determining factor for

increased or reduced breast cancer risk, but the main protective effect comes from the early first full-term pregnancy if a woman got married at an early age.

In the present study, the risk of breast carcinoma was more among cases who have had first pregnancy after 20 years as compared to cases who have had first pregnancy before 20 years of age. Furthermore, the risk was more in those cases who had first pregnancy after 25 years as compared to cases who had first pregnancy before 25 years of age. The difference found was statistically significant ($P < 0.0001$). Ewertz *et al.* also reported a significant trend of increasing risk with increasing age at first birth; women who had first pregnancy after the age of 35 years had 40% increased risk compared to those with first pregnancy before the age of 20 years.^[7] Findings of other studies were similar to the present study.^[8]

Helmrich *et al.* found that high parity was associated with a reduction in the risk for parity greater than or equal to 5, compared with parity 1-2, with the relative risk estimate being 0.7 (95% CI 0.5-1.0).^[8] Many other studies found similar results.^[3,9] The findings of the present study were similar to all of the above-mentioned studies; the risk was more in nulliparous women as compared to women having ≤ 2 children; risk of breast cancer was more in females having less than or equal to 2 children when compared to females having three to four children (P value 0.001).

Table 3: Analysis of age among cases and controls

Variables	Cases	Controls	t-test (P value)	95% CI
Age	49.98±11.6	49.54±12.0	Matched	
Age at marriage	17.46±3.29	15.87±3.31	<0.0001*	0.772-2.39
Age at first child birth	20.43±4.64	19.28±2.89	0.018*	0.195-2.10

*Significant values, CI=Confidence interval

Table 4: Selected characteristics by birth cohort in healthy controls

Decades	1945-1955 (n=25)	1955-1965 (n=33)	1965-1975 (n=35)	>1975 (n=35)	Total (n=128)	P value
Age at marriage (years)						
≤15	18 (72.0)	17 (51.5)	14 (40.0)	16 (45.7)	65 (50.8)	
>15	07 (28.0)	16 (48.5)	21 (60.0)	19 (54.3)	63 (49.2)	0.090
Age at first child (years)						
<20	15 (60.0)	17 (51.5)	24 (68.6)	17 (48.6)	73 (57.0)	
≥20	10 (40.0)	16 (48.5)	11 (31.4)	18 (51.4)	55 (43.0)	0.331
Total live births (numbers)						
≤3	07 (28.0)	17 (51.5)	16 (45.7)	25 (71.4)	65 (50.8)	
>3	18 (72.0)	16 (48.5)	19 (54.3)	10 (28.6)	63 (49.2)	0.009*
Total breastfeeding duration (years)						
<8	05 (20.0)	16 (48.5)	13 (37.1)	24 (68.6)	58 (45.3)	
≥8	20 (80.0)	17 (51.5)	22 (62.9)	11 (31.4)	70 (54.7)	0.002*

Figures in parentheses are in percentages.*Significant values

The present study supports the fact that breastfeeding has statistically significant role in the reduction of developing breast carcinoma risk. Polly *et al.* conducted a multicenter, population-based, case-control study to describe the association between lactation and the risk of breast cancer. After adjustment for parity, age at first delivery, and other risk factors for breast cancer, increasing the cumulative duration of lactation, was associated with the decreased risk of breast cancer among premenopausal women (P value for trend < 0.001) but not among postmenopausal, parous women (P value for trend = 0.51). A younger age at first lactation was significantly associated with a reduction in the risk of premenopausal breast cancer (P value for trend = 0.003). As compared with parous women who did not lactate, the relative risk of breast cancer among women who first lactated at less than 20 years of age and fed their infants for a total of 6 months was 0.54 (95% CI 0.36-0.82).^[10] Huo *et al.* found that breast cancer risk decreased by 7% for every 12 months of breastfeeding.^[9] Many other studies also reported that as the duration of breastfeeding increases, the risk of breast carcinoma decreased.^[3,11]

CONCLUSIONS

The study documents that early age at marriage, early age at first pregnancy, extended period of breastfeeding, and increased number of live births are protective for breast cancer. The study also documents the changing pattern in reproductive factors, which could explain the generally low incidence of breast cancer in Indian women and suggests that this may increase over time. Breastfeeding significantly reduces breast cancer, and so information, education, and communication activities for the promotion of breastfeeding and to create awareness of this fatal disease should be done.

REFERENCES

1. Breast cancer will become epidemic in India. [On line]. 2008. Available from: <http://www.thaindian.com/newsportal/health/>. [Last cited on 2009 May 22].
2. Indian Council of Medical Research. National Cancer Registry Programme of India – an Overview. Bangalore: NCRP; 2002.
3. Bidgoli SA, Ahmadi R, Zavarhei MD. Role of hormonal and environmental factors on early incidence of breast cancer in Iran. *Sci Total Environ* 2010;408:4056-61.
4. Pakseresht S, Ingle GK, Bahadur AK, Ramteke VK, Singh MM, Garg S, *et al.* Risk factors with breast cancer among women in Delhi. *Indian J Cancer* 2009;46:132-8.
5. Ebrahimi M, Vahdaninia M, Montazeri A. Risk factors for breast cancer in Iran: A case-control study. *Breast Cancer Res* 2002;4:R10.
6. Rosner B, Colditz GA, Willett WC. Reproductive risk factors in a prospective study of breast cancer: The Nurses' Health Study. *Am J Epidemiol* 1994;139:819-35.
7. Ewertz M, Duffy SW, Adami HO, Kvåle G, Lund E, Meirik O, *et al.* Age at first birth, parity and risk of breast cancer: A meta-analysis of 8 studies from the Nordic countries. *Int J Cancer* 1990;46:597-603.
8. Helmrich SP, Shapiro S, Rosenberg L, Kaufman DW, Slone D, Bain C, *et al.* Risk factors for breast cancer. *Am J Epidemiol* 1983;117:35-45.
9. Huo D, Adebamowo CA, Ogundiran TO, Akang EE, Campbell O, Adenipekun A, *et al.* Parity and breastfeeding are protective against breast cancer in Nigerian women. *Br J Cancer* 2008;98:992-6.
10. Newcomb PA, Storer BE, Longnecker MP, Mittendorf R, Greenberg ER, Clapp RW, *et al.* Lactation and a reduced risk of premenopausal breast cancer. *N Engl J Med* 1994;330:81-7.
11. Hadjisavvas A, Loizidou MA, Middleton N, Michael T, Papachristoforou R, Kakouri E, *et al.* An investigation of breast cancer risk factors in Cyprus: A case control study. *BMC Cancer* 2010;10:447.

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