A CASE-CONTROL STUDY OF CARCINOMA BREAST AMONG WOMEN : AN EPIDEMIOLOGICAL RISK FACTOR STUDY

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ABSTRACT

A hospital based case-control study of breast cancer was carried out during January to November 1991 at Command Hospital Southern Command, Pune. Ninety six cases of female breast cancer and an equal number of matched controls were studied. It was found that age at menopause and age at first birth had no significant ($p > 0.05$) association with the risk of breast cancer. A significant association was found between attainment of menarche before the age of 12 years and development of breast cancer ($p < 0.01$). A positive history of breast cancer in first degree relatives was also associated with an increased risk of breast cancer ($p < 0.05$). Body anthropometry was measured in terms of absolute body weight (in kg) and waist to hip ratio showed a positive association. Body weight of more than 55 kg ($p < 0.01$) and WHR more than 0.86 ($p < 0.01$) showed a significant risk.

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KEY WORDS : Breast cancer; Epidemiology; Risk factors.

Introduction

With the rapid control of communicable diseases and changing patterns of life styles, certain non-communicable diseases like cancer are emerging as important public health problems in developing countries like India. In the armed forces also, the incidence of cancer is showing a steady rise.

Breast cancer remains the most common invasive cancer in women, representing 32% of cancers and 18% of deaths [1]. In India, breast cancer is the second most common cancer among women after carcinoma cervix. The incidence of breast cancer in India as per the Bangalore based cancer registry varies between 13 and 17 per 100,000 female population [2].

Keeping in mind the increasing magnitude of the problem and a need for a better understanding of the epidemiologic risk factors and their control, a case-control study was undertaken at the Malignant Diseases Treatment

Centre (MDTC), Command Hospital Southern Command, Pune.

Materials and Methods

This hospital based case-control study was conducted during January to November 1991.

In this study, 96 cases of female breast cancer and an equal number of matched controls were studied. All clinically and histologically confirmed cases of female breast cancer diagnosed in the last two and half years and admitted to the MDTC were considered as cases. The control group comprised of patients admitted to CH (SC) Pune who were not suffering from any malignancy. Paired matching of cases and controls were done with regard to age (± 3 years), state of residence, and socioeconomic status (modified Prasad's scale). Matching was done in order to eliminate confounding variables.

The various epidemiological risk factors studied included; marital status, age at menarche, age at menopause, age at first birth, parity, breast feeding, family history and an-

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thropometry (body weight and waist to hip ratio (WHR)). Data was collected and analyzed. Odd's ratio and 'p' value were calculated to find out the strength and significance of association.

Results

Table 1 shows that majority of the subjects were in the age group of 40 years and above (69.8%). Majority hailed from northern part of India (55.2%). Modified Prasad's scale (based on monthly per capita income duly modified to meet the present day situation) was used to classify the socio-economic status. Majority were in class IV (62.5%) followed by class III (17.2%).

TABLE 1

Distribution of study and control group subjects according to matched variables.

Variables	Case No	%	Control No	%
1. Age (in years)				
< 30	12	12.5	12	12.5
31-40	18	18.8	18	18.8
41-50	34	35.4	34	35.4
51-60	18	18.6	18	18.6
> 60	14	14.6	14	14.6
2. State of residence				
North Indian	53	55.2	53	55.2
West India	14	14.6	14	14.6
Central India	06	06.3	06	06.3
East India	15	15.6	15	15.6
South India	08	08.3	08	08.3
3. Socioeconomic status (Modified Prasad's scale)				
I	05	05.2	05	05.2
II	14	14.6	14	14.6
III	17	17.7	17	17.7
IV	60	62.5	60	62.5
V	00	00.0	00	00.0

Table 2 shows the distribution of cases and controls according to risk factor variables studied. Data was dichotomized for each variable to calculate the 'p' value by McNemar's test.

All patients fell into two categories of marital status ie. married and unmarried. 94.8% of the cases and 96.9% of controls were mar-

ried. No significant association ($p > 0.05$) between marital status and breast cancer was found.

It was found that the majority attained menarche before 14 years of age. A significant association ($p < 0.01$) was found between attainment of menarche before 12 years and subsequent development of breast cancer.

53.1% of cases and 58.3% of controls had a parity ranging between 2 and 3 at the time of diagnosis of breast cancer. No significant association was found between low parity (i.e. one or less) and development of breast cancer. Most of the women had breast-fed their babies, majority, between 50-100 weeks. Only a small percentage had either never breast-fed or were nulliparous. An odd's ratio of 9 indicated that the risk of developing breast cancer was 9 times greater among those who had never breast-fed. A significant association ($p < 0.05$) was found between a positive family history of breast cancer and the development of breast cancer. 52.1% of cases as compared to 25% of controls had a body weight of more than 55 kg. A significant association was found between a WHR of 0.86 or more and development of breast cancer.

Discussion

In the present study majority of cases were in the age group of 40-60 years. In a similar study [3] at Bombay, breast cancer incidence was seen to rise in the third decade of life and increase steadily upto 50 years of age and then decline.

In an earlier report [3] it was found that the incidence of breast cancer was higher among spinsters than married women. According to the Bombay cancer registry, the rate of breast cancer is lower among married women. However, marital status cannot be really commented upon in this study as women population in service hospitals are essentially married barring out a small percentage of unmarried women.

In the present study a significant association was found between menarche before the age of 12 years and breast cancer. In one study

TABLE 2
Distribution of cases and controls according to risk factor variable

Variable	Case No	%	Controls No	%	p Value/OR
Marital status					p > 0.05
Married	91	94.79	93	96.6	OR = 2
Unmarried	05	05.21	03	03.13	
Age at menarche (yrs)					p < 0.05
> 15	13	13.54	12	12.5	
12 - 24	70	72.92	80	83.33	
< 12	13	13.54	04	04.17	
Age at menopause (yrs)					p > 0.05
> 50	06	06.25	05	05.21	
45 - 49	23	23.96	26	27.84	
< 45	25	26.04	25	26.04	
Premenopausal	42	43.75	40	41.67	
Age at first birth (yrs)					p > 0.05
< 20	58	60.42	63	65.61	
21-25	30	31.25	27	28.13	
26-30	02	02.08	05	05.21	
> 30	01	01.04	00	00.00	
Nulliparous	05	05.21	01	01.04	
Parity					p > 0.05
Nulliparous	05	05.21	01	01.04	
0 - 1	09	09.38	07	07.29	
2 - 3	51	53.13	56	58.33	
> 3	31	32.29	32	33.23	
Breast feeding (in weeks)					p < 0.05
0	09	09.38	01	01.04	OR = 9
1 - 50	07	07.29	09	09.37	
51 - 104	46	47.92	39	40.02	
> 104	34	35.92	47	48.96	
Positive family history in first degree relatives					p < 0.05
No	91	94.79	96	100	
Yes	05	05.21	00	09	
Body weight (kg)					p < 0.01
< 45	14	13.54	25	26.04	
46 - 50	13	13.54	16	16.67	
51 - 55	19	19.79	31	32.29	
56 - 60	22	22.92	16	16.67	
> 60	28	29.17	08	08.33	
Waist to hip ratio					
< 0.813	05	05.21	22	22.92	
0.813 - 0.854	20	20.83	18	18.75	
0.854 - 0.09	64	66.67	46	47.92	
> 0.91	07	07.21	10	10.42	

[4], women with menarche before the age of 12 years had almost two times higher risk of breast cancer than women attaining menarche after 13 years. However, no significant association was found between menopausal status and breast cancer. Thomas and Lillionfield (1976) have shown that natural menopause after the age of 55 years had a relative risk of 1.46 for developing breast cancer whereas relative risk decreased to 0.36 with artificial menopause before 35 years of age [5].

In an international case-control study by WHO, little evidence in favour of a protective effect of breast feeding was found against developing breast cancer once parity was considered in analysis [6]. In the present study, a significant association was found between those who had never breast fed and breast cancer.

Houston et al (1992) studied the relative risk of breast cancer in first degree relatives [7]. A significant association was found depending on the relative age of the index patient. In the present study also a significant association was found between a family history of breast cancer in first degree relatives and risk of breast cancer.

In a case-control study carried out in Netherlands among 225 breast cancer patients, body adiposity measured in terms of body

mass index and WHR showed that in post-menopausal women there was significant preponderance of central obesity [8]. In the present study, a significant association was found between body weight of more than 55 kgs and WHR of more than 0.86 and breast cancer risk.

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