Original Article

Risk factors for breast cancer in patients treated at NORI Hospital, Islamabad

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Abstract

Objective: To assess the risk factors for breast cancer in women attending Nuclear Medicine, Oncology and Radiotherapy Institute (NORI) hospital, Islamabad.

Method: A case control study was conducted at NORI from January to July 2005. A total 300 females, including 150 cases and their age matched healthy 150 controls were included. Cases had newly diagnosed breast cancer based on histopathological findings. Marital status, family history of breast cancer (first degree relatives), breast feeding history (12 months at least), smoking, parity, use of oral contraceptives (regular uptake for at least one year), and menopausal status were evaluated as risk factors for breast cancer. Demographical data and risk factor related information were collected using a short structured questionnaire. Logistic regression analysis was performed to note predictive effect of each factor on risk for breast cancer. $P < 0.05$ was considered statistically significant.

Results: No history of breast-feeding ($p = <0.001$), less parity ($p = 0.001$), smoking ($p = 0.001$), postmenopausal status ($p = 0.002$), family history of breast cancer ($p = 0.006$), unmarried status ($p = 0.008$), and use of contraceptive pill ($p = 0.03$) were associated with breast cancer.

Conclusion: Lack of breast-feeding, less parity, and smoking are most significantly associated with breast cancer in patients attending NORI (JPMA 57:242;2007).

Introduction

Breast cancer is most frequently diagnosed cancer in females. It has a major impact on health of women. According to a World Health Organization [WHO] estimate, more than 1.2 million people are diagnosed with breast cancer worldwide every year.[1] It is the second leading cause of cancer death in American women.[1] Breast cancer is the most frequently diagnosed cancer in Pakistani females.[2] Highest frequencies of breast cancer have been noted in Pakistani women compared to other Asian countries.[2,3] Breast cancer is responsible for about 38% of female malignancies referred to Nuclear Medicine, Oncology and Radiotherapy Institute [NORI], Islamabad, Pakistan.[4]

What exactly is responsible for development of breast cancer is still unknown, however certain risk factors increase a person's chance of getting breast cancer. Dietary factors, obesity, use of oral contraceptives, age and family history are considered important in etiology of breast cancer. Nulliparity, infertility, old age, early menarche, late menopause and positive family history had been found to have relationship with occurrence of breast cancer in Pakistani females.[5] Same has been observed at NORI as far as these risk factors are concerned, however it has also been noted that breast cancer patients were frequently long standing smokers. This study was done to assess relationship between various reproductive risk factors and smoking with breast cancer in females attending NORI.

Patients and Methods

This case control study was conducted at NORI from January to July 2005. Three hundred females were included in the study, 150 patients with newly diagnosed breast cancer [cases] and 150 healthy age matched controls. Cases were selected from NORI, while controls were selected from the general population.

Diagnosis of breast cancer in each case was based on histopathological findings. Subtypes of breast cancers were not considered while selecting cases. Subjects suffering from major illness like diabetes mellitus, hypertension, ischaemic heart disease, and any other cancer were excluded.

A specifically designed short structured questionnaire was used to collect data regarding risk factors for breast cancer from each subject. Cases and controls were interviewed/evaluated by single investigator after verbal consent. Age, marital status, family history of breast cancer (first degree relatives), breast feeding history (12 months at least), smoking (use of cigarettes/huqqa i.e., water pipe for $\geq$ 20 years), parity, use of oral contraceptives (regular uptake for at least one year), and menopausal status (twelve consecutive months of amenorrhoea without obvious cause) were recorded. Collected data was analyzed using Statistical Package for Social

Sciences [SPSS] version 10.0 Logistic regression analysis was performed to note predictive effect of each factor on risk for breast cancer, p<0.05 was considered statistically significant.

Results

Mean age of cases and controls was 42.39 $\pm$ 11.57 and 42.49 $\pm$ 11.30 years respectively. Majority of cases and controls were married. Cases less frequently gave history of breastfeeding, and were more likely to be smokers compared to controls. History of breast cancer in family, use of oral contraceptives, and post-menopausal status were more frequent in cases compared to controls. Similarly cases had less number of children compared to controls. Details of risk factor comparison between cases and controls are given in Table.

Discussion

All the factors sought by us were noted to be signif-

Table. Risk factors for breast cancer.

Parameters	Number (%)		p-value
	Cases (n=150)	Control (n=150)	
History of breast feeding			
No	71 (53.8)	21 (14.5)	<0.001
Partially (<12 months)	06 (4.5)	22 (15.2)	
Yes	55 (41.7)	102 (70.3)	
Parity	2.85 $\pm$ 1.95	4.00 $\pm$ 1.99	
Smoking			
No	103 (68.7)	133 (88.7)	0.001
Yes	47 (31.3)	17 (11.3)	
Marital Status			
Married	132 (88.0)	145 (96.7)	0.008
Single	18 (12.0)	05 (3.3)	
Menopausal status			
Premenopausal	108 (72.0)	130 (86.7)	0.002
Postmenopausal	42 (28.0)	20 (13.3)	
Family history of breast cancer			
No	120 (80.0)	137 (91.3)	0.006
Yes	30 (20.0)	13 (8.7)	
Use of oral contraceptive			
No	108 (81.8)	132 (91.0)	0.03
Yes	24 (18.2)	13 (9.0)	

icantly associated with breast cancer. Of these, lack of breastfeeding was most statistically significant risk factor. It is considered to be protective against development of breast cancer as confirmed by other studies.[6-8] Somewhat different results have been obtained in other Pakistani studies. In one study breastfeeding was associated with risk of developing breast cancer, while another concluded that breast cancer has no statistically significant relation with breastfeeding.[5,9]

Having fewer children was the second most significant risk factor in our study. Nulliparity increases lifetime incidence of breast cancer.[10] It was associated with 30% increase in risk compared to parous women in a meta-analysis from Nordic countries.[11] Child bearing two to three times reduces chances of developing breast cancer. A 7% risk reduction is noted with each successive birth. This risk reduction is most prominent when child birth occurs before 30 years of age.[12] In a Pakistani study, it was noted that breast cancer was common in women who had no issue (12.06%) or in whom children were born after the age of 30 years (9.37%).[13] Parity's protective effects is considered to be due to, 1) terminal differentiation occurring in breast tissue, temporary break from ovulation, greater transcription of BRCA or other genes, and mutagen elimination in breast milk.[14]

Cigarette smoking is not consistently associated with risk of breast cancer.[8,15,16] Currently it is not considered very important in the etiology of breast cancer, however opposite findings have also been noted. Women who start smoking as teenagers and continue to smoke for at least 20 years may increase their breast cancer risk.[17] Certain genotypes like SULT1A1 in combination with NAT2 fast acetylator status may increase breast cancer risk in women exposed to tobacco smoke.[18] Smoking was significantly associated with breast cancer in our study and its role needs to be further evaluated.

We observed a relationship between postmenopausal status and risk of breast cancer. High levels of serum estrogens, particularly estradiol, have been shown in multiple studies to increase the risk of breast cancer in postmenopausal women.[19] Significantly increased risk of breast cancer have been associated with natural menopause after the age of fifty four.[20] Early age at menopause is also important determinant of breast cancer risk which seems relevant in our subjects.[21]

Five percent of breast cancer cases are familial.[22] One third of familial breast cancer cases are considered to be due to a mutation in the BRCA1 gene on long arm of chromosome 17[10] in Pakistani breast cancer patients, 4-47.3% have been noted to have positive family history.[13,23] Risk of developing breast cancer increases two or more times if a woman has a first degree relative (mother, sister, or daughter) with breast cancer.[16] This risk further increases if relative had developed breast cancer before the age of 50 years.[16] Twenty five percent of our patients had positive family history.

Unmarried women had significant risk for breast cancer in our study. Various studies have shown that single and nulliparous married women have a similar increased risk for breast cancer as compared with parous women of the same age.[24] Risk reduction in married women probably results from early first full-term pregnancy.[25]

Conflicting views exist regarding role of oral contraceptives as risk factor for breast cancer. Oral contraceptives increase risk in BRCA1 mutation carriers. There is a small increase in relative risk of developing breast cancer in women on contraceptives and for 10 years after stopping them.[16] An increase in risk of premenopausal breast cancer is noted in younger women who use oral contraceptives for four years or more before first term pregnancy.[10] In one study significant inverse association between oral contraceptive and breast cancer was noted.[8] Our finding that oral contraceptive use is significantly associated with breast cancer has also been documented in another Pakistani study.[9]

In females, chances of getting breast cancer increase with age. The risk doubles every 10 years until menopause when the rate of increase slows.[10] Females over 60 years age are at greatest risk. Breast cancer patients in our study were relatively young. Similar results have been noted from other Asian subgroups i.e., Iranian and Vietnamese.[25] We do not have a specific reason for this, but it has been postulated that a relatively high proportion of young breast cancer cases in our region are due to young population structure, protective effect of high age at menarche and low age at first pregnancy on development of breast cancer in later life.[25]

Conclusion

No history of breast-feeding, less parity, smoking, postmenopausal status, family history of breast cancer, unmarried status, and use of contraceptive pill are risk factors for breast cancer in patients attending NORI.

Acknowledgements

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