

## **A case control study on risk factors of breast cancer among women attending MNJ Cancer Hospital, Hyderabad**

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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. Globally, breast cancer is by far the most frequent cancer among women, with an estimated 1.67 million new cases diagnosed in 2012 (25% of all cancers) and ranks second overall (12% of all cancers). It is now the most common cancer both in developed (794,000 cases) and developing regions (883,000 cases).

**Objectives:** 1. To study the risk factors for breast cancer among women attending MNJ Cancer Hospital, Hyderabad, Telangana. 2. To Study the association between risk factors and prevalence of breast cancer.

**Methodology:** A hospital based case control study was conducted on 100 cases and 100 controls admitted and treated in MNJ Cancer Hospital, Hyderabad in December 2015. Semi-structured questionnaire was used to collect information.

**Statistical Analysis:** Frequency distribution, Descriptive analysis and Chi Square test were used. Statistical Analysis was done using MS Excel 2007 and Epi info version 7.

**Results:** Women with age at first full term pregnancy  $\geq 30$  years had 3.14 times increased risk of breast cancer compared with age at full term pregnancy  $< 30$  years and the association was not significant ( $p > 0.05$ ), OR=3.14; 95% CI (0.61, 16.01). Breastfeeding for  $\leq 6$  months had 2.57 times increased risk when compared to those who have breastfed for  $> 6$  months and the association was not significant ( $p > 0.05$ ), OR=2.57; 95% CI(0.94,7.04). Family history had an association with breast cancer ( $p < 0.003$ ).

**Conclusions:** The cases had higher age at first full term pregnancy and lower duration of breast feeding when compared to the controls. Positive family history had a strong association with breast cancer.

**Keywords:** Breast cancer, case-control study, risk factors, breast feeding.

### **1. Introduction**

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. Globally, breast cancer is by far the most frequent cancer among women, with an estimated 1.67 million new cases diagnosed in 2012 (25% of all cancers) and ranks second overall (12% of all cancers). It is now the most common cancer both in developed (794,000 cases) and developing regions (883,000 cases).[1]

In South eastern Asia, estimated age standardised rates per 100,000 women is around 35 and mortality rate is 13/100,000 women.

India is rapidly stepping towards industrialization, urbanisation resulting in a change of life style factors,

particularly an increase in age at marriage, reduction in parity, improved socio economic status, etc. In India, the number of deaths due to breast cancer in the country has increased to 70,218 in 2012 from 50,821 in 2010. Around 25.8 new cases of breast cancer a year/100,000 women were recorded in India.[2]

Late marriage and fewer children among women have led to a decrease in cervical cancer cases. Ironically, these very factors have increased breast cancer rates in India. The established risk factors for cancer breast includes increased consumption of fat products, obesity, sedentary lifestyle, late marriages, parity, the factors leading to reduced breastfeeding are all supposed to be behind this amplified risk of breast cancer.

Several epidemiological studies have uncovered the risk factors and most of these studies have been conducted abroad and very few in India, and almost nil in South India. Hence there is need of doing research on risk factors for breast cancer in South India and the present study is an attempt to fill this gap.

**1.1 Objectives**

- 1) To study the risk factors for breast cancer among women attending MNJ Cancer Hospital, Hyderabad, Telangana.
- 2) To Study the association between risk factors and prevalence of breast cancer.

**2. Methodology**

The case control study was conducted at Mehdi Nawaz Jung Cancer Hospital, Hyderabad.

Delayed age at first delivery was considered as a risk factor 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. 100 cases were taken. For 1:1 allocation ratio the required number of controls was 100, hence total 200 individuals were included in the study.

**a. Selection of cases:**

**Diagnostic criteria for cases:**

All the female breast cancer patients, who got diagnosed and conformed by all the three methods namely clinical examination, biopsy finding and expert opinion (oncosurgeon).

**Eligibility criteria:**

All the stages of breast cancer and all age group of female who got diagnosed within 12 months from the date of interview.

Both pre-operative and seven days after post-operative cases who are all willing to participate.

**b. Selection of Controls:**

All the female patients other than breast cancer in the hospital during the interview.

Females who are having any history suggestive of breast cancer or any signs found during clinical examination are excluded from the study.

Group matching was done with age and sex with the age interval of 2 years.

**c. Data collection:**

After obtaining IEC clearance and permission from the Director of Cancer Institute, information about the exposure are obtained in both for cases and controls by using semi structured, pre tested questionnaire with the interview method.

Interview includes complete demographic details, general examination, reproductive history, family history, past history, lifestyle and stage at diagnosis.

**d. Statistical analysis**

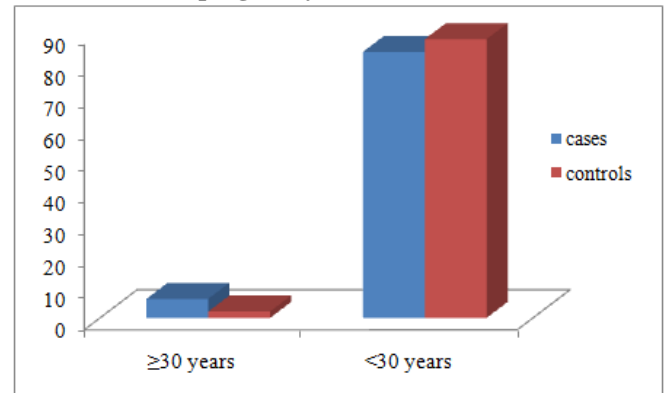
Data entry was done in MS Excel 2007 and analyzed by Epi info version 7. Descriptive analysis was done by IJBAR (2016) 07 (02)

summarizing categorical variables and results were expressed in percentages and represented in the form of tables and bar charts.

Chi square test was used to study the association between the risk factors and breast cancer. A p-value of <0.05 was considered as significant.

**3. Results**

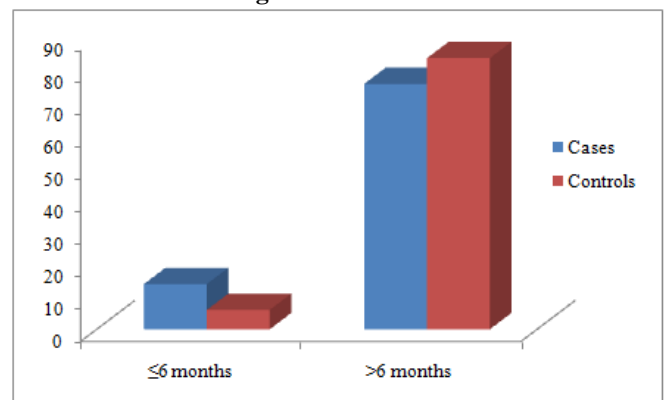
**Figure 1: Graph showing association of age at first full term pregnancy with breast cancer**



X<sup>2</sup>=1.177; p>0.05; OR=3.14; 95% CI (0.61, 16.01)

Among cases, breast cancer is more prevalent in women whose age at first full term pregnancy was <30 years (93.33%) when compared to those ≥30 years (6.66%) and the association was not significant (p>0.05). Most of the controls fall under <30 years age group (97.77%) when compared to ≥30 years age group (2.22%). Compared with the age at first full term pregnancy of below 30 yrs, age at 30 or above increased the risk (OR=3.14; 95% CI: 0.61-16.01).

**Figure 2: Graph showing association of duration of breast feeding with breast cancer**



X<sup>2</sup>=3.6; p=0.057; OR=2.57; 95% CI (0.94,7.04)

Among cases, breast cancer is more prevalent in women who have breastfed for >6 months (84.44%) when compared to those who have breastfed for ≤6 months(15.55%) and the association was not significant (p=0.057). Most of the controls fall under >6 months breast feeding duration group(93.33%) when compared to ≤6 months breast feeding duration group(6.66%). Compared with duration of breast feeding above 6 months, duration

below 6 months increased the risk (OR=2.57; 95% CI: 0.94-7.04).

**Table 1: Showing association of family history with breast cancer**

Family History	Cases	Controls	Total
Yes	10	-	10
No	90	100	190
Total	100	100	200

$X^2 = 8.526$ ;  $p = 0.003$

Among cases, breast cancer is more prevalent in women who had no family history of breast cancer (90%) when compared to those who had family history of breast cancer (10%) and the association was found to be significant ( $p < 0.05$ ). All the controls were found to have no family history of breast cancer (100%).

**Table 2: Showing distribution of Biomarkers in Breast cancer cases**

Biomarkers	ER	PgR	HER2
Positive	6	6	12
Negative	94	94	88

Among the cases, 6 cases were Estrogen Receptor positive (6%), 6 cases were Progesterone Receptor positive (6%) and 12 cases were Human HER2 positive cases (12%).

#### 4. Discussion

The present study reported significant unadjusted risk of breast cancer for the women with age at first full term pregnancy  $\geq 30$  years (OR=3.14; 95%CI: 0.61-16.01). Among parous women, age at first full term pregnancy was not statistically significantly associated with breast cancer risk ( $p > 0.05$ ). The findings are similar to study conducted by Kamath R *et al.* In the studies conducted by Joseph M. Ramon *et al.*, Gajalakshmi *et al.* and Soumen Das *et al.*, early age at first full term pregnancy has a protective effect from breast cancer. [3,7,18,19]

The present study showed significant unadjusted risk of breast cancer for the women who have breastfed for  $\leq 6$  months (OR=2.57; 95% CI: 0.94-7.04). There was statistically no significant association between duration of breast feeding and breast cancer risk ( $p = 0.057$ ). The findings are similar to the study conducted by Laufey Tryggvadottir *et al.* [17]. In the studies conducted by McCredie *et al.*, Vidayashankar, stated that breast cancer risk tended to fall amongst parous women with increasing duration of breastfeeding. [16]

There is a statistically significant association between family history and breast cancer risk ( $p < 0.003$ ). Hence education and awareness about the beneficial effects of screening will be helpful in controlling Breast Cancer.

#### 5. Conclusion

The cases had higher age at first full term pregnancy and lower duration of breast feeding when compared to the controls. Delayed age at first pregnancy should be avoided and breast feeding should be promoted. Positive family history is a risk factor; hence screening of all women who

have a family history of first degree relatives with breast cancer is essential. People should be made aware regarding the modifiable risk factors to prevent breast cancer. The role of biomarkers in breast cancer merits further exploration. Breast cancer 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 in reducing mortality.

#### 6. Limitations

This is a Hospital based study so the results of the study cannot be generalised to the whole population. The study was carried out in a small group of 50 subjects. Another limitation of the study is all the data were obtained from the women's self-reports.

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