



## Role of Different Factors Associated with Incidence of Breast Cancer: A Review

### KEYWORDS

Breast Cancer, Breast Self Examination, Oral Contraceptives, Hormone Replacement Therapy

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**ABSTRACT** Breast cancer is one of the leading causes of mortality globally. It is the second most common cancer among Indian women. This study is a critical review of literature which includes different aspects viz. socio-economic and demographic factors, use of oral contraceptives and hormone replacement therapy and knowledge attitude and practice of breast self examination. In the last section of the study discussion is made for further research point of view.

#### Discussion

On the basis of studies considered, we come to know that in late seventies and eighties, there was a great lack of awareness about breast health and after around one century western world started to become aware about the BC. Today we know several risk factors of this disease but it seems that there is a need to work in such a way that can predict the risk of getting BC on the basis of information for combination of different risk factor for example for a women of a particular age at menarche, given age at marriage and given age at first full term pregnancy, what would be the risk that she will diagnosed with BC in premenopausal or in postmenopausal years?

### Introduction

Breast cancer (BC) is increasing rapidly and has become an important public health problem in developing countries over the past few decades. (Jemal A et al., 2010; Everardo D. Saad, 2011; Imran Ali, 2011). Global incidence of BC has increased by 3.1% from 1980 to 2010. A survey conducted by Indian Council of Medical Research (ICMR) in the metropolitan cities viz. Delhi, Mumbai, Bangalore and Chennai; from 1982 to 2005 showed that the incidences of BC have doubled. According to Yip et al, 100,000 new patients are being detected every year in India (Yip et al, 2006; Michael et al, 2003). BC killed 425,000 women of whom 68,000 were aged 15-49 years in developing countries in 2010. (Forouzanfar MH, 2011). According to an estimate, about 15.0 million new cancer cases are expected to be diagnosed with about 12.0 million cancer deaths by 2020. (Brayand et al, 2006).

Various studies concerning disease experience with different aspects like, socio-economic and demographic aspect, use of contraceptives, hormone replacement therapy, breast self-examination –its knowledge and practice etc. are reported in literature. We present here a critical review of these studies as to pinpoint the gaps which may be addressed further.

The paper is organized, first taking socio-economic and demographic aspect of disease experience then use of oral contraceptives and hormone replacement therapy; thereafter knowledge Attitude and practice of breast self examination.

### 1. Socioeconomic and Demographic Aspect

Socioeconomic and demographic aspects play important role in occurrence and recovery of any disease. Various studies related to socio-economic aspects of breast cancer, which included age, year of education, household income, poverty, marital status, age at menarche, age at first full

term pregnancy and age at menopause, breast feeding, premenopausal and post-menopausal status and obesity, women living in urban areas etc. have been reviewed.

As age is concerned, there is an important study conducted in 1978 by American college of surgeons, which included 498 hospitals and 47 states and a total of 24136 female patients with confirmed BC. In this study it was found that young women under 35 years of age had poor survival and cure rates, whereas in women 35-44 years of age results were found comparable to the older group of patients (Takuma Nemoto et al. 1980). Kelsey JL, described that BC incidence rates increased with age throughout the life span in Western countries. The rate of increase of disease occurrence was found greater up to the age of 50 years than after 50 years (Kelsey JL, et al, 1988). In another study of 54896 women of age 31-89 years, who participated in the BC Detection Demonstration Project, it was observed that 226 of premenopausal and 1198 of postmenopausal women developed BC during a mean follow up period of 7 years. The risk of BC was found parallel with relative weights (weight(Kg)/height(m)) among postmenopausal women, whereas relative weights were not found associated with BC among premenopausal women in the same study (Yong LC et al, 1996). If we talk about women with and without BC, age at menopause was found 47.2±5.1 years for women with BC and 47.4±4.9 year for women without BC. It shows similarity of prevalence of menopause symptoms between the two groups (Conde et al, 2005). In some studies it was discussed that early age at menarche, late age at menopause increase the risk of BC (Kelsey JL et al, 1988, Kelsey JLetal, 1993).

A protective effect of breast feeding was observed in China, but this effect was not found in US (Kelsey JLetal, 1993). In one of the studies data for the period 1966 to 1998, identified through a MEDLINE research, regarding breastfeeding and BC risk, results indicated no associated

or rather a weak protective effect against BC. (Loren Lipworth et al, 2000). In one of the studies considered, BC was found more common among women in upper rather than lower social classes, among women who never have been married, among women living in urban areas, among white than black, and among those above the age of 50 years (Kelsey JL, et al, 1988).

Chatterjee et al, considered cancer incidence data for the period 2002-2012 of West Bengal and showed that the overall rates of cancer were increasing with greater increase among females. This study also revealed that BC is prevalent more in rural women with low socioeconomic status. (Chatterjee et al, 2012)

Another cross-sectional study examined the relationship between acculturation level and knowledge of BC risk through a sample of 135 Chinese women. The data reported that women with a better knowledge of BC risk were twice as likely to have higher income and more education. It was concluded that year of education, marital status and household income significantly predict BC risk knowledge level (Chen et al, 2004).

Pruitt S et al considered primary data on individuals of ages 18 years or more years from developed countries, and measured the association of area and individual socioeconomic status (SES) with breast and other cancer screening. In this study poverty, income, and education were reported as common factors at both levels (Pruitt et al, 2009).

In one of the studies 24-hour urine catecholamine samples and saliva cortisol samples of 193 adult subjects were considered and it was observed that lower SES was associated with higher levels of cortisol and epinephrine and marginally higher levels of norepinephrine. These associations were also found independent of race, age, gender, and body mass. (Sheldon et al, 2006)

#### **Use of Oral Contraceptives (OCs) and Hormone Replacement Therapy (HRT)**

Use of Oral Contraceptives is increasing in day-to-day life. We touched some risk factors related with the use of OC and explored its association with BC in the literature. We looked for risk factors, such as are age, age at menarche, age at menopause, premenopausal and postmenopausal obesity, OC use in early reproductive period, use of hormone replacement therapy and body mass index.

In one of the studies, incidence of BC among users and nonusers of OC was determined. The incidence was found identical in users and non-user women of age 45 years or younger. This study revealed a positive association between OC use of women over 45 years of age and BC. In the same study risk ratio estimates and 90% confidence interval observed were 4(1.8-9.0) in women of age 46-50 years and 15.5(5.2-4.6) in women of age 51-55 years. Hence OC was found associated with strong increase in BC risk in premenopausal women of 46-55 years (Jick H et al, 1980).

We came across another study of 52,705 women with BC and 108,411 women without BC which was based on data from 21 countries. In this study the number of postmenopausal women with known age at menopause was 53,865. 33% of these women had used HRT. Median age at first use was found 48 years. This study revealed an increased relative risk of having diagnosed by 1.023 (95% CI

1.011-1.036;  $2p=0.0002$ ) for each year of use for the current users (who ceased use 1-4 years previously), whereas the relative risk of use of HRT for 5 years or longer was found 1.35(1.21-1.49;  $2p=.0001$ ), with average duration of use 11 years. Hence in this study the increase in relative risk of BC was found associated with long duration of use in current users and the recent users and it was suggested that cessation of use of HRT reduces this effect but not wholly (Venn A et al, 1997).

The Collaborative Group on Hormonal Factors in Breast Cancer included 54 studies in 26 countries and considered a total of 53,297 women with BC and 100,239 women without BC. Use of OC was found in 41% and 40% of the women with BC and without BC respectively. The median age at first use, median duration of use and median duration since last use were observed 26 years, 3 years, and 16 years respectively. A small increase in the risk of having BC diagnosed was found in current users of OC and in women who had stopped its use in past 10 years whereas the risk was not found increased in women who had stopped its use for more than 10 years. The recent users who began use before 20 years of age were also observed at higher risk than the recent users who began use at older ages (Anonymous, 1996). However, a study also reported that incidence of BC do not increase with OC use. In this study 747 women of age 21-45 with BC diagnosed in 1983-1990 were taken after identification through the Seattle-Puget Sound Surveillance, Epidemiology and End Results cancer registry. The study found that use of OC for 10 years or more was associated with a small increased risk of BC (odds ratio for  $\geq 10$  years = 1.3; 95% confidence interval [CI] = 0.9-1.9;  $P$  for trend = .03), especially among women not older than 35 years (odds ratio for  $\geq 10$  years = 1.7; 95% CI = 0.9-3.1) (White E et al, 1994) (1994.19). In another study of use of OC for a women of age more than 40 years was marked as it may increase the risk (Thomas DB, 1991). BC was also found modestly related to OC use early in reproductive life (odds ratio for use within 5 years of menarche = 1.3; 95% CI = 1.0-1.8;  $P$  for trend = .04) (White E et al, 1994).

As far as use of hormone replacement therapy is concerned, we came across a study that showed that long term use of combined estrogen /progestin HRT increased the risk of BC and an moderately increased risk was found linked to long term estrogen replacement therapy (Kelsey JL, 1993).

In another study also, it was concluded that the risk of BC diagnosis is higher among the women, who have used HRT than among women who have not. This risk was observed increased with duration of treatment and was found reduced at the time when treatment was stopped. In the same study, the risk was found almost completely disappeared in duration of 5 years after the end of the treatment. Study also revealed that increase in the risk of BC may be larger with estrogen -progestogen therapy than with estrogen alone. (Clavel-Chapelon F et al, 2000). Same results were also drawn by Kelsey JL (Kelsey JL, 1993).

#### **Breast Cancer Screening**

McCaul compared women with and without a family history of BC. In this study women with a family history were found more likely to have been screened. Feeling vulnerable to BC was found positively related to having obtained a screening. Study concluded that greater worry is related to higher screening levels (McCaul, 1996).

Maria C. Katapodi et al conducted a cross-sectional survey and examined the relationship between women's reported social support and their adherence to recommend BC screening. A sample of 833 low-income women with a mean age of 46.2 years from three ethnic groups (i.e., Latina, Caucasian, and African American) was considered, who were not breast cancer survivors. Women who did not adhere to screening (for BSE or CBE) reported less social support (Maria C. et al, 2002).

In another study, a sample of 1364 African American, US-born white, English-speaking Caribbean, Haitian, Dominican, and Eastern European women were recruited to determine which of several emotional propensities were associated with the frequency of mammograms and clinical breast exams. In this study three emotion-related variables repression, cancer worry, and embarrassment were examined and it was found that self-regulation and cancer worry were both positively associated with mammogram and clinical breast exam frequency, while embarrassment regarding having a mammogram was found negatively associated with screening. It was also concluded that screening rates for African American women equalled or exceeded the rates for European Americans (Nathan S Considine, 2004).

#### **Knowledge Attitude and Practice (KAP) of Breast Self Examination (BSE)**

In one of the studies, conducted in Turkey, a sample of 718 female high school students was included and data was collected for knowledge of breast self examination, its practice and knowledge of risk factors for BC. Study revealed that the female high school students had insufficient knowledge about breast self-examination and a low percentage of students reported that they had performed breast self examination monthly. The most common reason for not doing breast self-examination was reported as "not knowing how to perform breast self-examination" (98.5%). In this study significant relation was observed between breast self-examination practice and age, school grade, knowledge about BC and knowledge about breast self-examination (Ozgul Karayurt et al, 2008).

In a cross-sectional survey of teachers working in schools, a sample of twenty schools was selected, that included primary, intermediate and secondary schools. In this study data were collected from 421 female teachers with 87.5% response rate. In this study it was found that 67.5% of the participants had information about BC and their sources of information were found health professionals/workers (98.2%), friends/neighbour (83.5%), TV/Radio (76.0%) and printed

Materials(60.2%).Of the participants,18.5% reported positive family history of BC,49.9% were found having no knowledge of practicing BSE,29.0% were found having knowledge of the but never applied it. Moreover, 81.9%had no breast examination by health professionals and 85.7% did not know what the mammography is.(Naif A.Alharbi,2012)

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In a community based study, conducted in northeast Nigeria, included 1600 rural women aged 20-40 years from 28 randomly selected village units between April and June 2010.Study disclosed that only 931 (58.2%) of them had heard of BC. Of these, 263 (28.2%) perceived the cause as being brought about by a medical condition, 199 (21.4%) spiritual, 194 (20.8%) hereditary, 143 (15.4%) use of bras-sieres and 21 (2.3%) excessive breastfeeding. 360 (38.7%) knew about Breast self-examination (BSE). Only 176 had ever done it; of those, 16 (9.1%) did it because one of their family members had BC. It was reported that more than half (58.8%) will use BSE if it is of benefit to them, 19.9% if their husbands agree and 4.2% if there is known cure.(Babaturji Omotara,2012).

In another descriptive cross sectional study a sample of 287 senior secondary school female students from selected schools in the municipal area council of Abuja, Nigeria was considered. In this study mean age was observed 16.5 ± 1.4 years and a greater proportion of respondents 163 (56.8%) were found having poor knowledge of BC while 217 (75.6%) had poor knowledge of BSE. Only 114 (39.7%) of the respondents were found having knowledge that being a female was a risk factor for BC and the least known risk factors reported were obesity and aging whereas the major source of information for BC and BSE among the respondents was the mass media. Only 29 (10.1%) of respondents had practiced BSE. Study reported that knowledge of BSE is significantly associated with BSE practice (A.R. ISARA, 2011).

We came across a cross-sectional study conducted at university Sains Malaysia in which 200 participants from 10 randomly selected universities were interviewed. Mean age of the respondents was found 26.7 years. Study revealed that the vast majority of the female university students had inadequate knowledge of BC. In the same study Indian students were found having significantly less knowledge of BC compared to their Chinese and Malay counterparts( $p < 0.05$ ).However, more than two third of the students were found aware of BSE and clinical BC examination(CBE) recommendations(Hadi AA,2010).

#### **Discussion**

On the basis of studies considered, we come to know that in late seventies and eighties, there was a great lack of awareness about breast health and after around one century western world started to become aware about the BC. Today we know several risk factors of this disease but it seems that there is a need to work in such a way that can predict the risk of getting BC on the basis of information for combination of different risk factor for example for a women of a particular age at menarche, given age at marriage and given age at first full term pregnancy, what would be the risk that she will diagnosed with BC in premenopausal or in postmenopausal years?

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