

The relevance of established risk factors in context to Indian breast cancer patients

Abstract

Breast cancer is the most common cancer affecting the females across the world and even in India. There has been an alarming rise in the incidence of breast cancer and there is an urgent need to control them by modifying the risk factors. Various risk factors with convincing evidence of causing breast cancer have been identified. These include increasing age, young age at first child birth, null parity, obesity, avoiding breast feeding, use of oral contraceptives and alcohol. However, the physique and the lifestyle of Indian breast cancer patients are quite different from their western counterparts. Various epidemiological studies from India do not the presence of these risk factors in a convincing form. So, this review was done to evaluate the prevalence of risk factors in Indian breast cancer patients.

Keywords: breast cancer, India, age, parity, breast feeding, obesity, contraceptive pills

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Abbreviations: IARC, international agency for research on cancer; AICR, American Institute of Cancer Research; BMI, body mass index

Introduction

Breast cancer is the most common female cancer in the world with an estimated 1.67 million new cancer cases diagnosed in 2012. Though the age adjusted incidence rates of breast cancer in India is lower than the western countries, because of the large population the burden of breast cancer is high and increasing day by day. With an annual incidence of approximately 1,44,000 new cases of breast cancers in India, it has now also become the most common female cancer in India.¹ Many risk factors are presumed to increase the chance of having breast cancer. These factors have been summarized in a systematic review conducted by an expert panel committee of the International Agency for Research on Cancer (IARC) and the American Institute of Cancer Research (AICR) on the basis of the strength of the existing evidence.^{2,3} Factors with convincing evidence for increasing the risk of breast cancer include increasing age, age at first childbirth, parity, alcohol consumption, obesity and use of oral contraceptives. Further breast feeding has also shown sufficient evidence for decreasing the risk of breast cancer. However, this classification of the risk factors was based on studies conducted in patients from western countries. The physique and lifestyle of Indian women is quite different from those of western world. Early marriage, young age at first childbirth, multiparity and long durations of breast feeding is traditionally seen in a majority of Indian women. The use of oral contraceptives is not very common in Indian women as tube ligation is by far the most prevalent birth-control method used in three-fourth of the female population.⁴ The consumption of alcohol in Indian women is also very less, as it is a social taboo for majority of them.⁵ With this background, this review was done to evaluate the prevalence of breast cancer risk factors in Indian women, which include age, age at first childbirth, parity, duration of breast feeding, obesity and alcohol use as reported in various recent studies from India.

Discussion

Breast cancer in India is on a rising trend in all parts of the country and across all population. The average age in Indian patients is seen to be younger than those from western countries. A majority of our patients are in the fourth to sixth decade of their life whereas, reports from the western world show that female breast carcinoma is predominantly seen in the fifth and sixth decade.⁶ The mean age of the patients was found to be 49 years ranging from 20 to 99 years in a study at a tertiary cancer centre in western India by Ghosh J et al.,⁷ on 2001 breast cancer patients.⁷ Similar findings have been reported among north Indian population, where a study by Sandhu DS et al.,⁸ showed a mean age of 47.39 years in female and 56.5 years for male breast cancers and 65.8% patients were below 50 years.⁸ Further Raina V et al.,⁹ reported median age of 47 years in their patients with equal distribution of premenopausal and postmenopausal status.⁹ Similarly, Bhadoria AS et al.,¹⁰ reported 62.5% of their patients to be between 30-50 years with mean age of 45±10.29 years.¹⁰ Balasubramaniam SM et al.,¹¹ also found 35.5% of their patients in the age group of 41-50 years with mean age of 49.1±10.85 years.¹¹ The average age of our breast cancer patients may be even lower, as most of our patients present in an advanced stage probably due to low level of awareness, cumbersome referral pathways and limited access to standard cancer care in the country.¹² Early age at first full-term pregnancy is inversely related to breast cancer risk.¹³ The probable explanation could be either a pregnancy induced maturation of mammary cells, which makes them less susceptible to carcinogenic transformation or a long-lasting hormonal change or both. Takalkar et al.,¹⁴ reported the age at the time of first child birth to be 18.6±/- 4.2 years ranging from 16 to 25 years in their study on breast cancer patients of western India.¹⁴ Though there are not many studies reporting the age at first child birth of the breast cancer patients, the average age in Indian women at the time of first childbirth is 19.9 years as compared to 25.6 years in the United States and 28.1 years in the United Kingdom.¹⁵ Having multiple full term pregnancies or high parity has generally been associated with low breast cancer risk in various epidemiological studies along with

nulliparity being associated with an overall increased risk of breast cancer.^{8,13} Contradictory to these studies and available literature it was found that most of the Indian women with breast cancer were multiparous. In the study by Talwalkar et al.,¹⁴ 94% of the patients were multiparous.¹⁴ Similarly, a study by Pakseresht S et al.,¹⁶ showed that 80% of cases had parity of at least four.¹⁶ Practicing breast feeding is supposed to minimize the risk of breast cancer in both pre- and postmenopausal patients. The longer the duration of breastfeeding by women, the greater the protection and the risk are relatively reduced by 4% for every 12 months of breastfeeding.¹⁷ Breast feeding for long duration is a very common custom seen across India. One of the largest studies done in India to examine the relationship between breastfeeding and breast cancer risk has shown mixed results; it reported that increased duration of breastfeeding was associated with a significantly decreased risk of premenopausal breast cancer, but no effect was seen in women with postmenopausal breast cancer.⁸ Obesity is an established risk factor for breast cancer as these women have higher levels of circulating estrogen which promotes ductal proliferation by interacting with intracellular receptors, especially ER- α . Excessive ductal proliferation is associated with accumulation of mutations in various genes, including HER2/neu, and TP53, which promote aberrant cell proliferation leading to carcinogenesis. In Indian context, a study by Meshram et al.,¹⁸ showed that majority, 41.82% had normal body mass index (BMI between 18.5 to 22.99).¹⁸ Further, 19.09% had low BMI (less than 18.5) indicating underweight. Similar findings were also observed by.^{19,20}

Similarly, women using oral contraceptive pills have an increased risk of developing breast cancer as they contain estrogens. However, the pattern of contraceptive use in India suggests that the dominating perception across married non pregnant women in India is to produce the desired number of children quickly with little spacing between successive births and then choose terminal methods of contraception, like tube ligation to stop childbearing.²¹ This thought process or custom is reflected in various Indian studies, which shows very few breast cancer patients with a history of the use of oral contraceptives. In one such study by Pakseresht S et al.,¹⁶ 98% of the patients gave no history of the use of oral contraceptives.¹⁶ As per study by Dumitrescu and Cotarla the risk of breast cancer increases progressively in a dose-dependent manner to an alcohol intake of 60g (2-5 drinks) per day, depending on the strength of the drink and for every 10g increment in daily alcohol consumption, the risk increases by 9%.²² Alcohol consumption in general, is very low in Indian women so, most of the Indian studies have no data on alcohol intake. In one such study by Pakseresht S et al.,¹⁶ no patient had a history of alcohol intake.¹⁶

Conclusion

The overall data from Indian studies suggests that the role of known or established risk factors in the development of breast cancer in the Indian population is rather unclear and a large multi-center study would be of benefit to evaluate these findings and search for probable factors.

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Conflict of interest

The author declares no conflict of interest.

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