Pattern of risk factors of breast cancer at a tertiary care hospital in Bangladesh

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Abstract
Background*: Breast cancer is the commonest cancer of women worldwide. Bangladesh is no exception. It is one of the major causes of cancer related death among Bangladeshi women. To adopt an early detection strategy to this cancer is vital. For this, it is important to analyse the risk factors for developing breast cancer in our population, which might not be like those of the western population.*
Objectives*: to evaluate the risk factors of breast cancer in women at a tertiary care hospital in Bangladesh.*
Methods*: it's a descriptive type of cross-sectional study. Data were collected prospectively over a period of six months starting from 1st August 2010 to 28th February 2011 from 60 diagnosed female breast cancer patients admitted to Dhaka Medical College Hospital. Pre-designed semi-structured questionnaire was used for assessing risk factors after taking Informed written consent from each of the participants. Male patients, severely ill patients and patients unwilling to take part in the study were excluded. After analysis & compilation the results were presented in tables, graphs and charts.*
Results*: The mean age of the patients was 37.13 years. 95% of the patients were married and 85% of them were multipara. Most of the parous women had more than 2 children. 72.2% gave their first childbirth between 15-19 years. The mean age of menarche was 12.15 years. Ten patients were postmenopausal. 10% of patients had a family history of breast cancer. The mean age of this subgroup of patients was 31.83 years. Only 2 were smokers. 75% of patients used hormonal contraceptives. Mean duration of use was 6.82 year. Seventeen patients had BMI above 25.*
Conclusion*: Breast cancer is common among relatively younger women, majority below 40 years, in our study. Risk factors like nulliparity, late age of pregnancy, obesity and avoidance of breast feeding were found to be absent in contrast to western study. Though use of oral contraceptive was found in most patients. The mean age of getting cancer was much lower in subgroup of patients having family history of breast cancer. Larger multicenter studies are warranted in this regard.*
Key words*: Risk factors, Breast cancer, Tertiary care hospital*

I. Introduction

Breast cancer is by far the most common cancer in women worldwide accounting about 2.3 million new cases and 666103 deaths each year [1]. It is the second most common cancer both in the developed and developing countries. In low- and middle-income countries the incidence has been rising steadily in the last years due to increase in life expectancy, increase urbanization and adoption of western lifestyles.[1] Breast cancer is the highest ranking cancer among Bangladeshi females with an incidence of 12989 per year [2]. The continuing rise in breast cancer incidence has created an urgent need to develop strategies for early detection and treatment. Risk factors for developing breast cancer in Bangladeshi population may not be the same as of the western population due to different genetic, ethnic and environmental factors. Moreover, detection of breast cancer by population based mammographic screening will be expensive for a developing country like Bangladesh. For this reason, by identifying the risk factors in our population, we can select the group of patients who can be benefited most from the screening program. We can even set up a strategy to screen the high-risk group followed by planning of future preventive and treatment modalities. Thus, the mortality and morbidity related to breast cancer can be reduced.

II. Patients And Methods

It is a descriptive type of cross-sectional study. It was carried out over a period of six months starting from 1st August 2010 to 28th February 2011 in different surgical wards of Dhaka medical college Hospital. A total of 60 female patients with diagnosed breast cancer admitted to in-patient department of this hospital during the study period were enrolled in the study as case. Data were collected by purposive sampling, all inclusive who gave informed written consent after admission into the hospital with the help of semi-structured questionnaire for assessing the risk factors. The patients were subjected to a detailed history recording especially of their epidemiological factors which are known to have relation in causation of carcinoma breast. Male patients, severely ill patients and patients unwilling to take part in the study were excluded from the study. All consecutive samples were included. A written Informed consent was taken from each case. At the end of the study the data were compiled and analyzed. Then the results were presented in tables, graphs and charts.

III. Results

The mean age was 37.13 years. The youngest patient in this series was 22 years old and the eldest was 57 years. More than half of the patients were in their thirties (61.66%).

Table I: Age incidence of breast cancer (n=60)

Age group (in years)	Number of patients	%
21-30	9	15
31-40	37	61.66
41-50	10	16.66
51-60	4	6.66

In this series, 57 patients were married which is 95% of the total study population.

Table II: Marital status of cases of breast cancer (n=60)

Marital status	Number of patients	Percentage
Married	57	95
Unmarried	2	3.33
Widowed	1	1.66

In this series, 52 patients were multiparous, which is 85% of the total study population. 3 patients were uniparous & 6 were nulliparous.
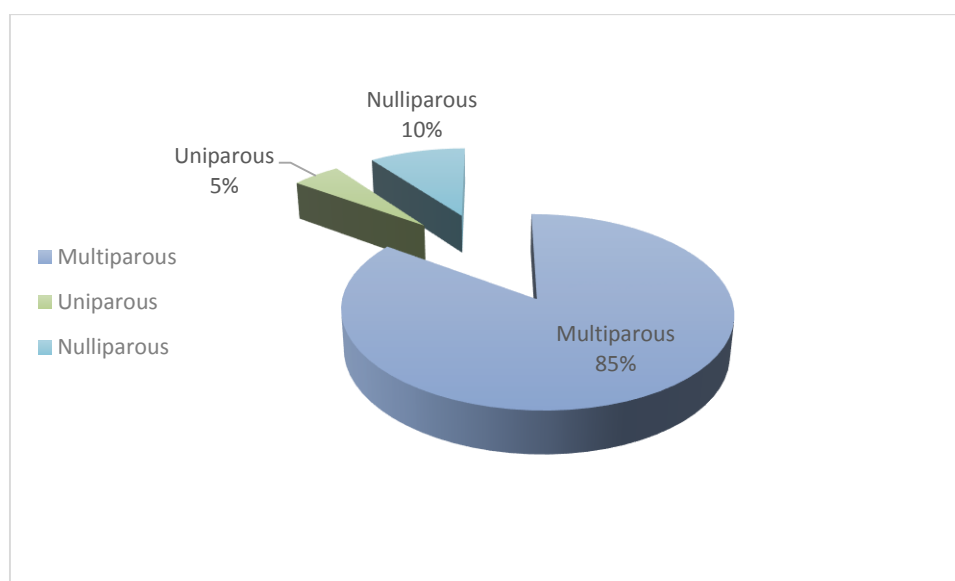

Fig I : Parity of cases of breast cancer (n=60)

Among the 54 parous women the mean number of children per woman was 2.61.

Table no III: Number of children in breast cancer patient (n=54)

Number of children	Number of patients	Percentage
0	6	11.11
1	3	5.55
2	13	24.07
3	25	46.30
4	12	22.22
5	1	1.85

The most common age group at first childbirth among the 54 parous women was 15-19 years in 39 patients (72.22%) and the mean age at first childbirth was 18.94 years.

Table IV: Age at first childbirth in breast cancer patients (n=54)

Age at first childbirth (in years)	Number of patients	Percentage
15-19	39	72.22
20-24	13	24.07
25 or more	2	3.70

Among the 54 parous female, 100% of the patients breast-fed their babies.

The age at menarche ranged from 10 years to 14 years, the most common age being 12 years. The mean age at menarche was 12.15 years.
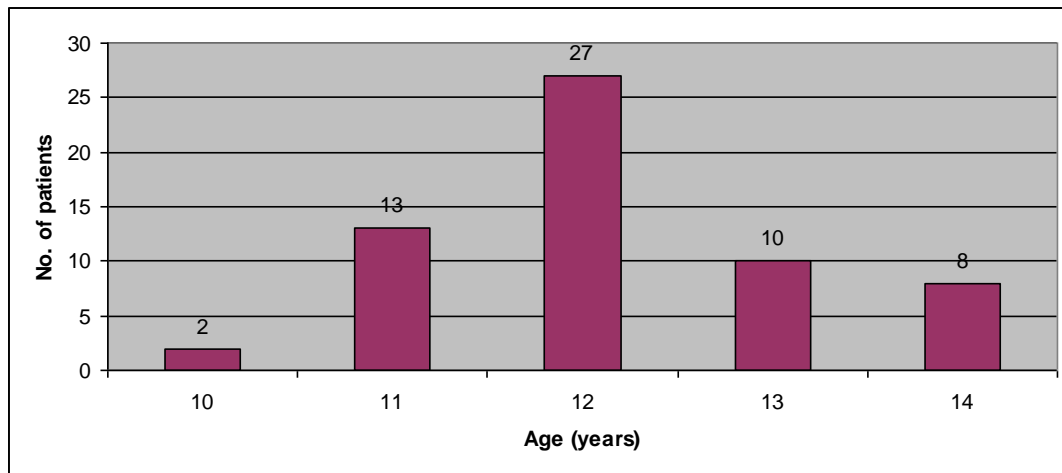

Figure II: Age at menarche (n=60)

10 patients were post-menopausal which accounts 16.66% of the total patients. The most common age of the time of attainment of menopause, was 41-50 years.
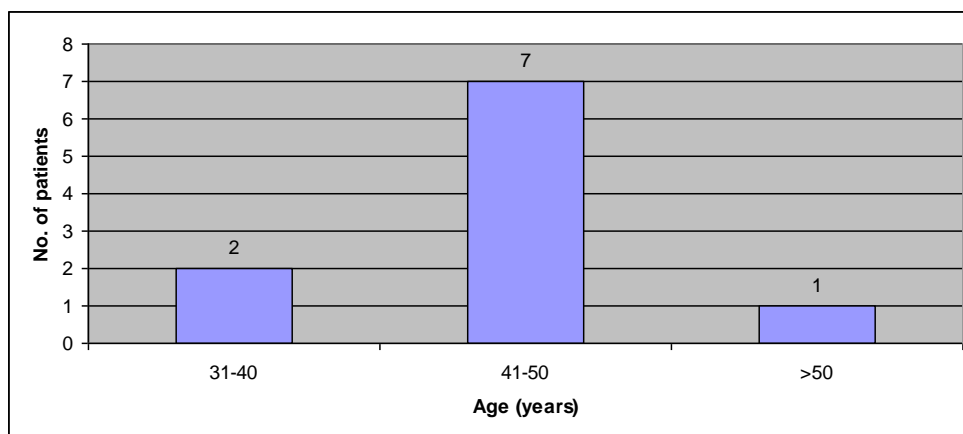

Figure III: Age at menopause (n=10)

History of breast cancer in first degree relatives was present in 6 patients (10%). The mean age in these patients was 31.83 years as compared to the overall average age of 37.13 years. In the remaining 54 patients, no significant family history could be elicited.
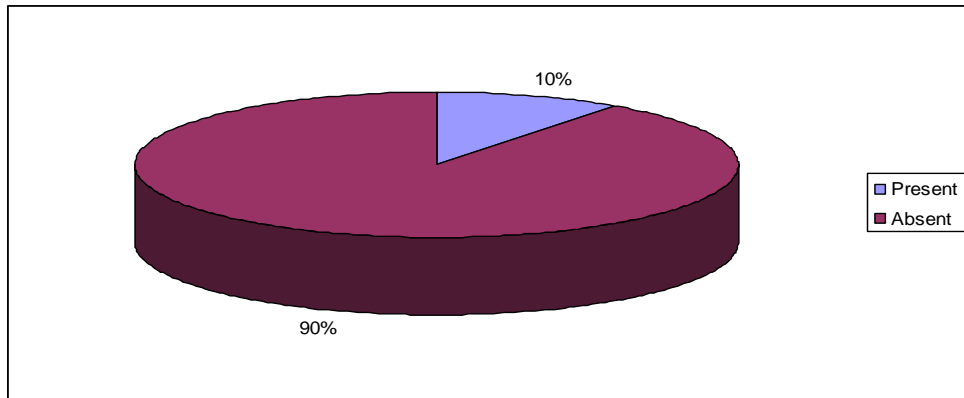

Figure IV: Incidence of breast cancer patients having family history (n=60)

Among the 60 cases, only 3 patients had family history of other cancers in first degree relatives, which is 5% of the total case.

Table V: Family History of other cancer (n=60)

Family history of other cancer	Number of patients	Percentage
Present	3	5
Absent	57	95

None of the patients gave any history of suffering from other neoplasms.

Only 2 patients were smokers, which was 3.33% of the total cases. The other 58 patients gave no history of smoking.

Table VI: History of smoking (n=60)

History of smoking	Number of patients	Percentage
Present	2	3.33
Absent	58	96.66

Among the 60 cases, no patients gave history of intake of alcohol in their lifetime.

45 patients (75%) used hormonal contraceptives for family planning purpose for different period. The mean time of duration of use was 6.82 years. The other 15 patients (25%) gave no history of taking any hormonal contraceptives.
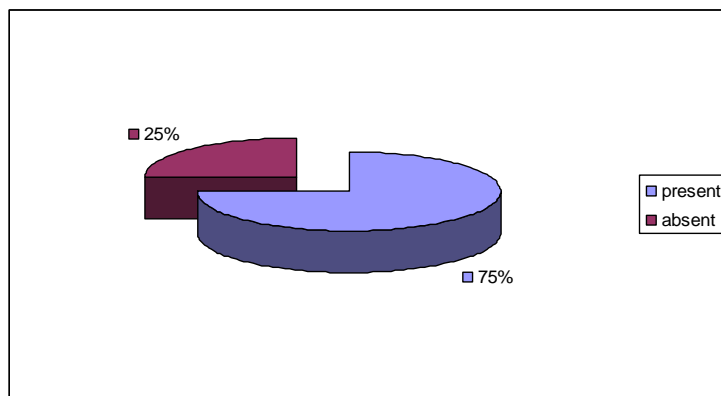

Figure V: Use of hormonal contraceptives (n=60)

17 patients had a Body Mass Index of greater than 25 and were overweight or obese. The remaining 43 cases had a normal BMI.
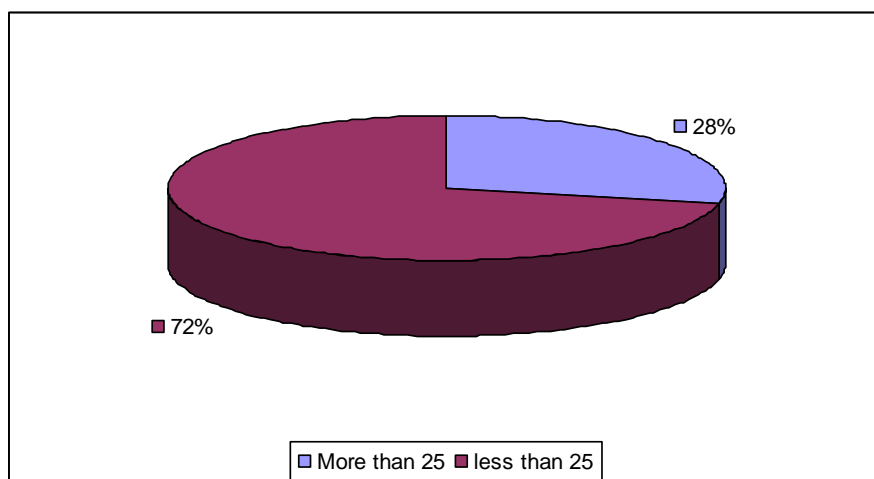
Figure VI: Body Mass Index in patients with breast cancer (n=60)

IV.   Discussion

Breast cancer is the most frequently diagnosed cancer in women worldwide with an estimated 2.3 million new cases in 2020.[3] More than half of these cases occurred in economically developing countries, especially Asia and Africa. Female breast cancer incidence rates varied internationally by more than 13-fold in 2008, ranging from 8.0 cases per 100,000 in Mongolia and Bhutan to 109.4 per 100,000 in Belgium.[4] But no doubt that both the incidence rates and mortality rates have risen over the last decades. This may in part reflect low screening rates and incomplete reporting in developing countries. The most rapid rises are seen in developing countries, where breast cancer risk has historically been low relative to the western industrialized countries.[5] Age adjusted incidence is low in most countries of Asia although rates are more than 50 per 100,000 in Manila in Philippines and South Karachi, in Pakistan.[6] Rates in Singapore particularly among Chinese are also relatively high for the region. Rising incidence has been observed in India as well. In Africa breast cancer is the most frequent cancer among women.[3]

Every year in Bangladesh approximately 13,000 women develop breast cancer many of whom never seek treatment.[3] Prompt diagnosis and treatment provides the best chance of long term survival but for many reason Bangladeshi women do not seek treatment early and often presented at an advanced stage of the disease.[7]

The present study is an attempt to evaluate the risk factors of breast cancer among the patients admitted at in patient department of Dhaka Medical College Hospital, a tertiary care hospital in Bangladesh. Though this is a small study.

Age of the cancer patient is an important factor both for early detection and management of the case. The incidence of the breast cancer increases as the age increases.[5] Previously in the USA and other western countries the age distribution at diagnosis was bimodal with a dominant peak frequency near the age 50 years and a smaller peak near the age 70 years. But during 2000 to 2003 the bimodal age distribution returned to predominantly younger age at onset but still a peak frequency near age 50 years.[5] Goel A, Bhan C et al, in a five year clinico-pathological study between 1997 to 2002 in India found breast cancer was most common in 30-40 years age group.[8] Saxena S et al also found the average age of patients in India was 47.9 years.[9] These Indian studies support our findings which found breast cancer to be most common in age group 31-40 years which is 61.66% followed by age group 41-50 years which is 16.66% with the average age of 37.13 years. Yoo K-Y, Kang D et al in Korea and Mousavi SM and Montazeri A in Iran found breast cancer to be most prevalent in 40-49 years age group.[10,11] The reason for early age of occurrence amongst Bangladeshi females needs to be further studied. A similar viewpoint has been put forward by a study conducted by Borovanova in the Czech population. In their study also, they found a shift of cancer more towards younger women.[12]

Numerous studies carried out in both eastern and western populations have identified various reproductive factors generally associated with breast cancer. A case control study at Mumbai, India indicate that single women compared to married women has a 4-5 fold higher risk and nulliparous women has a 2.2 fold higher risk than parous women for development of breast cancer.[8] In contrast to the findings, in our series only 2 cases (3.33%) were unmarried and among the married women only 4 were nulliparous.

Multiple pregnancy and pregnancy at an early age reduces the risk of breast cancer.[13] Though in this study most of the women had their first baby between 15-19 years of age (72.22%) whereas only 2 (3.70%) had delivered first after 25 years. The reason behind might be, the prevalence of child marriage in Bangladesh & girls getting pregnant very early after marriage.[14]

Compared to controls, women with breast cancer are more likely to have long reproductive life with early age of menarche and late age of menopause and to have fewer children.[15,16] In our series the age of onset of menarche in most cases (45%) is 12 years and of the 10 patients who develop menopause 7 of them developed it between 41-50 years. Nulliparity is a risk factor for breast cancer.[16,17] Surprisingly most of the patients of our series were multiparous.

Kahlenborn C et al and Carmichael AR et al have shown that the use of oral contraceptives is associated with an increased risk of pre-menopausal cancer, especially with use before first full term pregnancy in parous women.[22,18] In our study, 45 patients (75%) used oral contraceptives which are in agreement with the said study. Though we haven't checked whether they had it before the first full term pregnancy or after.

Hollander D et al has shown that for every 12 months a woman breast feds, her risk of breast cancer declines by 4%.[19] A meta-analysis comprising of Twenty-four articles with 27 studies involving 13,907 breast cancer cases suggested that breastfeeding, particularly a longer duration of breastfeeding, was inversely associated with risk of breast cancer.[20] Hollander D et al has also shown that for every 12 months a woman breast feds, her risk of breast cancer declines by 4%. This is in contrast to our findings where 100% patients who were parous had their breast suckled by their babies. It is difficult to explain the phenomenon. It warrants deeper investigations.

Family history is another risk factor of breast cancer. It has been noted that women who have first degree relatives with breast cancer have a risk 2-3 times than that of general population.[9] The study on clinico-morphological pattern of breast cancer by Saxena S et al in a New Delhi Hospital has found 20.2% patients with a positive family history. One of the explanations for familial aspects of breast cancer is germ line mutation in BRCA1, BRCA2, p53 and other genes.[21] These cellular genes, which comprise dominantly acting oncogenes and recessively acting tumor suppressor genes, have been shown to contribute to genetic predisposition to variety of human cancers. Although we found it in only 10% of cases.

A woman's built, the risk of breast cancer and its subsequent prognosis seem to be related. In most but not all case–control and prospective cohort studies, an inverse relationship has been found between weight and breast cancer among premenopausal women.[22] However, most large epidemiological studies have found that overweight or obese women are at increased risk of developing postmenopausal breast cancer.[22] As estrogen, a risk factor for breast cancer, is synthesized in adipose tissue. Thus, it is suggested that higher BMI is associated with a more advanced stage of breast cancer at diagnosis in terms of tumor size but data on lymph node status is not so consistent. All treatment modalities for breast cancer such as surgery, radiotherapy, chemotherapy and hormonal treatment may be adversely affected by the presence of obesity. The overall and disease-free survival is worse in most but not all studies of prognosis of obese pre and postmenopausal women with breast cancer.[22] In contrary to these findings, in our study fewer patients (28%) were overweight or obese i.e. had a BMI of greater than 25.

Limitation of the study
The study was a single center study with a smaller sample size. Hence the results might not be representative of the entire population of e. As such there might be some biases.

V.   Conclusions
From this study, breast cancer is found to be common among relatively younger age groups with a majority below 40 years. In contrast to western studies, many of the known risk factors like nulliparity, late age of pregnancy, obesity, avoidance of breast feeding, were not found to be present in our study population. In our study most patients were multiparous, pregnant at early age and breast fed their babies. Though a few numbers of patient had family history of breast cancer, but the mean age of getting cancer was much lower in this subgroup of patients. Risk factors like oral contraceptive use for long years was present in most of the patients. This is a single center study with a smaller sample size. Larger multi centre studies addressing risk factors of breast cancers for our population is badly needed to set strategy for early detection and finding out at risk group.

Conflict of interest
The authors declared that they have no conflict of interests.

References

[1].   Country-specific, Incidence and Mortality of different cancers: Bangladesh. *Globocan 2020* (2020).
[2].   Ferlay, J. *et al.* Cancer statistics for the year 2020: An overview. *Int. J. Cancer* 149, 778–789 (2021).
[3].   Cancer Today. https://gco.iarc.fr/today/fact-sheets-populations.
[4].   Ferlay, J. *et al.* Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int. J. Cancer* 127, 2893–2917 (2010).
[5].   Bray, F., McCarron, P. & Parkin, D. M. The changing global patterns of female breast cancer incidence and mortality. *Breast Cancer Res.* 6, 229–239 (2004).
[6].   Malik, A. M., Pathan, R., Shaikh, N. A., Qureshi, J. N. & Talpur, K. A. H. Pattern of presentation and management of Ca breast in developing countries. There is a lot to do. *J. Pak. Med. Assoc.* 60, 718–721 (2010).
[7].   tory, H. L. *et al.* Improving Outcomes from Breast Cancer in a Low-Income Country: Lessons from Bangladesh. *Int. J. Breast Cancer* 2012, 1–9 (2012).
[8].   Goel A, Bhan C M & Srivastava K N. Five year clinico pathological study of breast cancer - PubMed. *Indian J. Med. Sci.* 57, 347–349 (2003).
[9].   Saxena, S. *et al.* Clinico-morphological patterns of breast cancer including family history in a New Delhi hospital, India-A cross-sectional study. *World J. Surg. Oncol.* 3, 67 (2005).
[10].   Yoo, K. Y. *et al.* Epidemiology of breast cancer in Korea: occurrence, high-risk groups, and prevention. *J. Korean Med. Sci.* 17, 1–6 (2002).
[11].   Mousavi, S. M. *et al.* Breast cancer in Iran: an epidemiological review. *Breast J.* 13, 383–391 (2007).
[12].   Borovanová, T. & Soucek, P. [Breast cancer: an overview of factors affecting the onset and development of the disease]. *Cas. Lek. Cesk.* 141, 80–84 (2002).
[13].   JE Tyczynski, F Bray, D. P. Breast cancer in Europe. *ENCR Cancer Fact Sheets* 2, (2002).
[14].   UNICEF, N. Y. United Nations Children's Fund. Ending child marriage: A profile of progress in Bangladesh. (2020).
[15].   La Vecchia, C. *et al.* The role of age at menarche and age at menopause on breast cancer risk: Combined evidence from four case-control studies. *Ann Oncol* 3, 625–629 (1992).
[16].   Opdahl, S., Alsaker, M. D. K., Janszky, I, Romundstad, P. R. & Vatten, L. J. Joint effects of nulliparity and other breast cancer risk factors. *Br. J. Cancer* 105, 731–736 (2011).
[17].   Britt, K., Ashworth, A. & Smalley, M. Pregnancy and the risk of breast cancer. *Endocr Relat Cancer* 14, 907–933 (2007).
[18].   Kahlenborn, C., Modugno, F., Potter, D. M. & Severs, W. B. Oral Contraceptive Use as a Risk Factor for Premenopausal Breast Cancer: A Meta-analysis. *Mayo Clin. Proc.* 81, 1290–1302 (2006).
[19].   Hollander D. In developed and developing countries, breast cancer risk is reduced by 4% for each year of breastfeeding. *Perspect. Sex. Reprod. Health* 34, 319 (2002).
[20].   Zhou, Y. *et al.* Association Between Breastfeeding and Breast Cancer Risk: Evidence from a Meta-analysis. *https://home.liebertpub.com/bfm* 10, 175–182 (2015).
[21].   Saxena, S. *et al.* BRCA1 and BRCA2 in Indian breast cancer patients. *Hum. Mutat.* 20, 473–474 (2002).
[22].   Carmichael, A. R. & Bates, T. Obesity and breast cancer: a review of the literature. *The Breast* 13, 85–92 (2004).