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A Study Survey on Risk Factors Associated with Breast Cancer in Bangladeshi Population

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Abstract

Background: The occurrence of breast Cancer is a rising concern in Bangladesh. A hospital based case control study was conducted.

Methodology: A nationwide representative sample of 100 out of 115 cancer patients aged 20 or older was interviewed at NICRH to provide information on awareness of the risk factors of breast cancer causes in Bangladeshi population.

Results and discussion: Highest number of patients was from 40-49 (39%) and 30-39 (27%) year-age group. About 15% patients had direct family history, 21% had early periods. About 14% have got late menopause. If women begin menopause after age 55, the risk increases. 15% women have had not had children, and 10% had their first child after age 30. Study found women using birth control pills (47%), have slightly greater risk. 9% women's breast feeding lasts below 1 year. And about 7% patient never breast fed their child. About 40% female patients do not walk as exercise.

Conclusion: Results suggested a mixture of different factors with Aging and direct family history poses higher risk for breast cancer.

Keywords: Breast cancer; Ductal carcinoma; Lobular carcinoma; Risk factors

Abbreviations: DCIS: Ductal Carcinoma *In-Situ;* LCIS: Lobular Carcinoma *In-Situ;* IBC: Inflammatory Breast Cancer; ILC: Infiltrating Lobular Carcinoma; IDC: Infiltrating Ductal Carcinoma; BRCA1: Breast Cancer 1; BRCA2: Breast Cancer 2; PHT: Post-menopausal Hormone Therapy; HRT: Hormone Replacement Therapy; DSC3: Desmocollin-3; MASPIN: Mammary Serine Protease Inhibitor; DNMT: DNA Methyltransferase; NICRH: National Institute of Cancer Research and Hospital.

Introduction

Breast cancer is a threatening neoplasm that begins in the cells of the breast in women and men. Around the world, breast cancer is the second most common type of cancer after lung cancer (10.4% of all cancer incidence, both genders counted) [1] and the fifth most common cause of cancer death. In 2004, breast cancer caused 519,000 deaths worldwide (7% of cancer deaths; almost 1% of all deaths) [2].

The two most common types of breast cancer are named after their origin-(i) most common Ductal carcinoma begins in the tubes (ducts) that move milk from the breast to the nipple. Around 85% to 90% of all breast cancers are ductal. If the cancer is DCIS (ductal carcinoma *in situ*), it is well contained, not intrusive, and can be effectively treated. And (ii) Lobular carcinoma starts in parts of the breast, called lobules, those produce milk. The lobes are located deeper inside the breast, under the ducts. About 8% of breast cancers are lobular. If the cancer is LCIS (lobular carcinoma *in situ*) then the disease is constrained inside the projection and has not spread.

Breast cancer is usually, but not always, principally classified by its histological appearance. Uncommon variations are characterized on the premise of physical exam findings. For example, inflammatory breast cancer (IBC), a type of ductal carcinoma or malignant cancer in the ducts is recognized from different carcinomas by the inflamed appearance of the affected breast [3].

Epidemiology

The quantity of cases worldwide has essentially expanded since the 1970s, a wonder somewhat faulted for advanced ways of life in the Western world [4]. The occurrence of breast cancer fluctuates significantly around the globe, being lower in less-developed nations and most prominent in the more-developed countries [5]. Women in the United States have the most elevated frequency rates of breast cancer in the world [6]. A few studies have found that black women in the U.S. are more likely to die from breast cancer despite the fact that white women are more likely to be diagnosed with the illness [7,8]. Research is progressing to define the impact of both biological and cultural factors [7,9].

Treatment

Emerging observations suggested that inhibiting the catalytic activity of epigenetic writers might create a new direction for the treatment of human malignant carcinomas. For instance, previous study demonstrated that inhibition of histone methyl transferase G9a leads to the reactivation of tumor suppressors DSC3 and MASPIN in breast cancer [10]. It has been found that the main functions of G9a

are establishing of H3K9me2 and protection of loss of imprinted DNA methylation [11,12]. Indeed, in breast cancer cells that treated with G9a inhibitor, a reduction of H3K9me2 has been observed and this inhibition is mimicked via using 5-Aza-2'-deoxycytidine, an inhibitor for DNA methyltransferases [10]. Taken together, aberrantly established H3K9me2 and abnormal distribution of DNA methylation marker might play a role in the initiation of breast cancer and inhibition either G9a or DNA methyltransferase (DNMT)s might be a novel and promising direction for the treatment of this disease.

Materials and Methods

Description of study area

The study was reviewed and approved by national institute of cancer research and hospital (NICRH). All newly diagnosed cases of cancer patients aged 20-80 were identified by collaborating physicians in NICRH. For each case, patient's registry files obtained and reviewed. The interview was conducted by close and personal meeting. The methodology was:

a. Critical perusal of secondary sources (e.g. books, article, reports, websites etc.)

b. Primary data collection through field interviews, case studies and questionnaires

c. A detailed review of the first draft of the report through consultation with the supervisor.

A detailed three-part questionnaire was developed on the basis of the existing literature, opinion and suggestion received from the supervisor and seniors.

Interviews and questionnaire

In person structure interviews were conducted were control cases and the next-of-kin of deceased cases. Of the 115 eligible cases identified, 15 refuted, which gave the final count as 100. Information was obtained about demographic characteristics, occupation and residence histories, living condition, history of selected medical condition and family history of cancer, diet, reproductive history and passive smoking.

At first medical history of patient was asked as the demographic profile may sometimes lead the patient to an embarrassment and they refused to answer. So, data was collected from the registration form of NICRH. In every question, there were some options to assist. The sampling procedure was non-probabilistic and convenience sampling. Percentage and frequency of the attributable fractions were calculated for each risk factor of cancer.

Results and Discussion

A sum of 100 subjects responded to the interview, response rate was lower in the 20s strata than in the other age groups, but no trend to an increase in response rate with increasing age was observed. Overall no significance differences in area age dispersion was between the specimen population and study respondents. Response rate tended to be lower among subjects who reside in the Barisal division and in urban communities other than five divisions that among other subjects [13-18].

Overview of Risk Factors

The present survey revealed, targeted at the Bangladeshi cancer patients for female, cancer is causing by contraceptive method, reproductive history, age, tobacco chewing, viral and bacterial contamination and women hygiene had a tendency to be higher than major lifestyle factors such as dietary factors (Table 1).

A founding paper of this subject was the work of Janet Lane-Claypon [19], distributed a near study in 1926 of 500 breast cancer cases and 500 controlled patients of same background and life style for the British ministry of health. With the use of computer, the unit was the first to comply large amounts of cancer data. Cutting edge epidemiological strategies are closely connected to latest concept of disease and public health policy over the past 50 years, great endeavors have been spent on mustering information across medical practice, hospital, provincial state and even national boundaries as an approach to examine the inter dependence of environmental and cultural factors of confirmation.

For British most concerning issue confronting cancer epidemiology today is the changing idea of "Cancer Incidence". For example – a breast cancer tumor with a very slow growth rate may be found with a mammogram 50 years. While the same tumor may have been found as a noteworthy lump at 760 years, depending on the specific growth factor effecting on the particular patients' case as diagnostic tools improved this has a direct impact on the epidemiological data.

The present study revealed that most of the cancer patients used to take imbalanced diet. Data indicates that most cancer s appeared to be related to environmental factors and diet is one of the factors and that diet is one of this factor which appears to play a vital role. Results from epidemiological, clinical, and animal studies have suggested that- 1) a reduction in total calories decreases risk for a number of tumor type, 2) dietary protein is directly correlated with the risk of cancer, 3) increase dietary fat is correlated with increased risk for breast cancer but we found that Bangladeshi female patients take quite a low fat in their diet. The present study showed that only about 22% patients take sufficient fat in their diet. Though the female cancer patients do not take much of fat they are the victims of breast cancer (Table 2). About 15% of female cancer patients were found to have familial history of cancer which corresponds to other reports (Table 2) [20]. Hereditary abnormalities can be classified into two classes: inherited and acquired. Inherited genetic abnormalities are present in the genetic molecules of each of the estimated 50 trillion body cells of an adult human, because the genetic abnormalities were present in the fertilized egg by contrast, acquired genetic abnormalities are acquired by individual cells during one individual's life term, and are only present in the cell which are

Risk factors that cannot be changed	Significantly higher risk	Previous history of breast cancer
	Moderately higher risk	Age and gender [13,14], Direct family history of breast cancer [13], Genes [15] (e.g. BRCA1 and BRCA2)
	Slightly higher risk	Distant family history, Previous abnormal breast biopsy, Age at first childbirth [15], Early menstruation, Late menopause, Overweight or obese [16], Excessive radiation, Other cancer in the family, Heritage [17], Race, Hormone Replacement Therapy (HRT).
Risk factors from lifestyle		Use of contraceptives, Postmenopausal hormone therapy (PHT), Combined PHT, ERT, Breast-feeding, Alcohol [17], Lack of physical exercise.
Uncertain risk factors		High fat diets [16], Antiperspirants and bras, Abortions, Pollution, Tobacco Smoke [18].

Table 1: Factors of breast cancer causes among the Bangladeshi patients.

descendants of those particular cells. Acquired genetic abnormalities can range from very small chromosomal changes to complex adjustment in chromosomal structure. Several lies of proof persuade most cancer scholars that malignancy incepts its development from one genetically abnormal cell. Indeed, in order to become malignant, that one cell certainly must accumulate several predisposing genetic abnormalities in addition to any predisposing genetic abnormalities which are available from heredity. The Scandinavian twin study does not disparage the significance of acquired genetic abnormalities in the causation of behavior of cancer cells. Unfortunate individual inherits genetic abnormalities which can predispose every cell to become malignant, but the full set of genetic abnormalities required for malignancy is inherited seldom, instead of the full set is accumulated in a particular cell over time. And the likelihood of accumulation is the same cell is dictated by the cells environment- by its introduction to agents which can cause alterations in the cells genetic molecules. Because the significance of acquired genetic abnormalities in causing

High fatty food diet ratio	Excessively Taken	Not Taken
	22%	78%
Direct family history (mother, sister or daughter) ratio	Yes	No
	15%	85%
Passive smoking ratio	Yes	No
	72%	28%
Use of plastic container ratio	Used	Not Used
	86%	14%
Physical activity (walking) ratio	Yes	No
	60%	40%
Marital status at the time of the disease diagnosed ratio	Married	Unmarried
	91%	9%

Table 2: Survey results of factors contributing in development of Breast cancer.

the disease is very widely acknowledge, no discontinuity truly exists in hereditary and environmental causes of cancer.

In the present investigation 21.4% female patients were reported to have weakened immune system as observed by other authors. All cancer is the result of an immune system that did not destroy mutant cells. Obviously, cancer cells are foreign to the body. The immune system of a healthy person destroys 10000 mutated cells every day. When this defense ceases, the cancer cell can multiply and become a clinical case of cancer.

It is observed that the chances of getting cancer increases with age [20] (Figure 1A), female 53.4% patient similar findings while reported by other authors. The largest risk factor for developing cancer is age. There are a number of known and suspected causes an age dependent susceptibility to cancer. 1) Mutations increase with age, 2) aging tissue and cellular micro environment, 3) tumor suppressor and longevity assurance genes, 4) life time carcinogenic exposure, 5) decreased ability to repair DNA, 6) oncogene activation and amplification, 7) decrease tumor suppressor gene activity, 8) micro environment alteration, including hormonal alterations or exposures, 9) decreases immune surveillance due to immune senescence.

Among female cancer patients 56.5% had abnormal reproductive function such as age administration, age at first birth (Figure 1B), parity, breast feeding (Figure 1C) and age at menopause were considered involvement of these risk factors were observed by other authors. Every woman's hormone levels change throughout her life for a Varity or reasons and hormone changes can lead to changes in the breasts. Hormone changes that occur during pregnancy may influence a woman's chances of developing breast cancer.

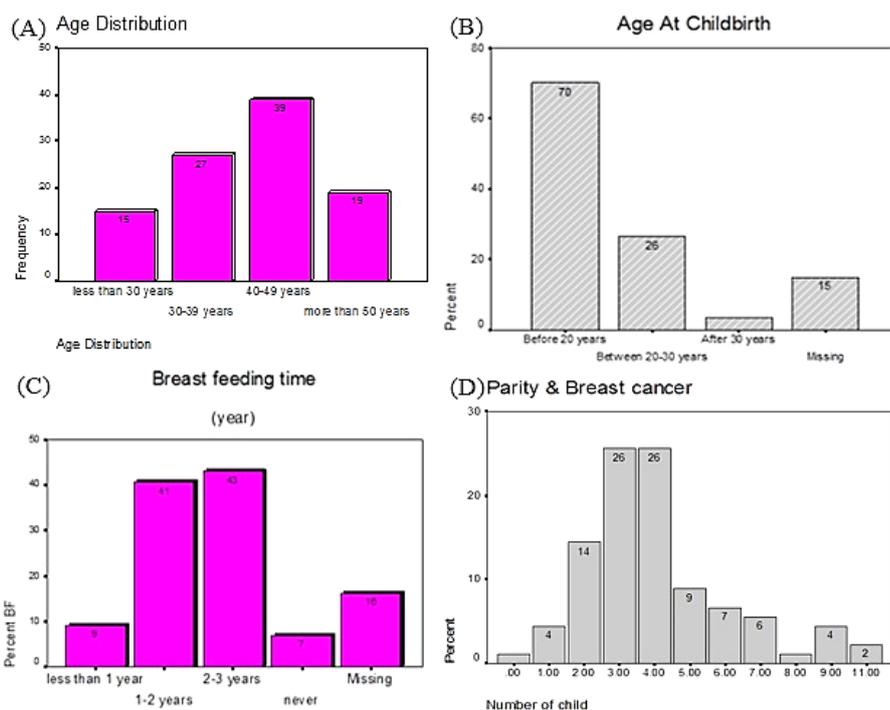Women, who had their first menstruation at an early age (before 12)

Figure 1: (A) Age distribution (Aging is a major risk factor of breast cancer.), (B) Age at the birth of the first child, (C) Not breast feeding, (D) Not having children or having them later in life.

or went through menopause later than normal after 55, are at higher risk of developing breast cancer (Figure 2A and 2B), Hormones can prolong the growth rate of cell high levels of hormones specific to the reproductive years of a woman, particularly if they are not hindered by the normal hormone changes of the pregnancy; seem to increase the risk for breast cancer. Some studies propose that even breast feeding can diminish the risk for developing breast cancer if continued until the 18th to 24th month. Pregnancies and breast feeding reduce the number of menstrual cycle during a woman's lifetime (Figure 1D and Table 3).

47% female cancer patients were observed to have history if contraception causes different type of cancers (Figure 2C), Smith and his associates also observed many women successfully endured the amenorrhea or irregular bleeding which frequently accompany use of long-acting "progestogen only" methods, there is a substantial minority, particularly in certain ethnic groups, who find this unsuitable. The extensive writing does indicate that albeit combined estrogen-progestogen once-a-month injectables deliver much more regular bleeding patterns than long acting injectable like depot-meroxyprojesterone acetate the patterns are not entirely normal. Detailed studies by the World Health Organization have shown some deviation from normal menstrual patterns by user of the two-once-a-month injectable, Cyclofem and mesigyna. These caused breast cancers (~60%) [21]. Contraceptive pills might play in breast cancer risk. Studies have found that women now using oral contraceptive pills have a slightly greater risk of breast cancer than women who have never used them.

Most studies found no link between active cigarette smoking and breast cancer. The study showed that about 72% patient do secondhand smoke (Table 2). About 86% patients use plastic container in their daily house hold activities (Table 2). About 40% female patients do not walk for 2 hours in a day. Only 60% patients walk for two hours per day (Table 2). Previous reports also suggested the relationship between lack of physical activity and development of the disease [20]. About 91% female patients were married at the time of the disease diagnosed (Table 2).

In this study 31.4% breast cancer patients were found to have the history of induced abortion. The reason is actually quite simple: early in pregnancy, amid the first trimester, hormones animate breast development in preparation for milk production. That development take place in two phases, both of which have to complete or a woman runs a risk for malignancy. In the primary phase, the hormone estrogen makes breast cells multiply repeatedly. This rapid increase in multiplying breast cells continues until other the 32nd week. At that point, in a normal pregnancy, fresh chemical messengers instruct the breast cells to convert from multiplying cells to milk production cells. Once a multiplying cell has been converted to a milk production cell, it does not ever switch back. Its capacity to multiply is turned off forever. Our result corresponds with other result in different countries.

Conclusions

In final comments, consciousness of the attributable fraction of cancer causes among the Bangladeshi female cancer patient history
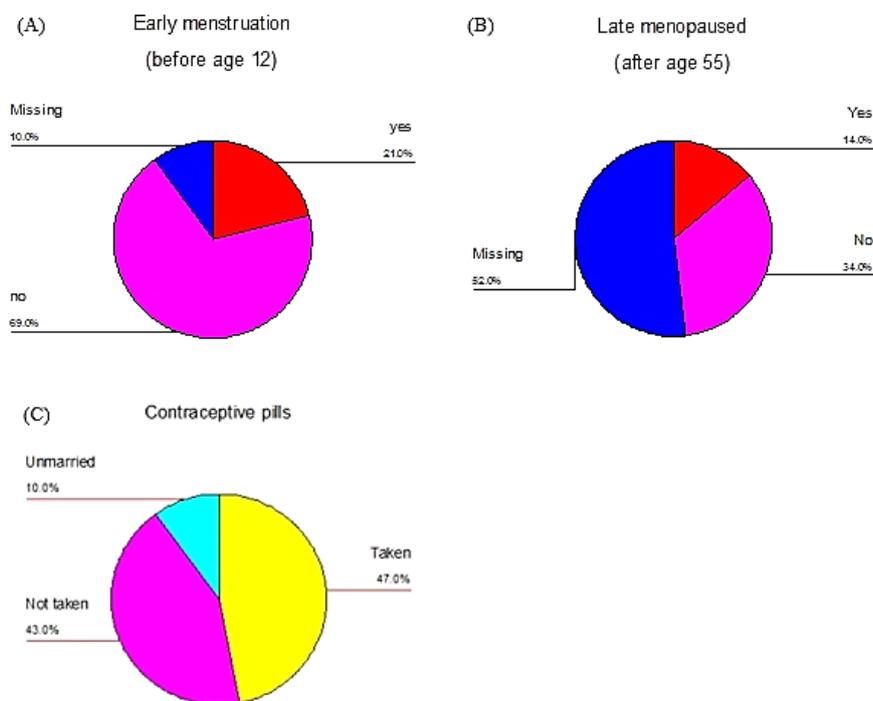

Figure 2: (A) Early periods (below 12 years) related to breast cancer, (B) Late menopause related to breast cancer, (C) Use of birth control pills.

	Number	Minimum	Maximum	Mean	Std. Deviation
Number of child	90	0.0	11.00	4.0889	2.16533
Valid Number	90				

Table 3: Not having children or having them later in life (Descriptive Statistics).

of contraception, abnormal reproductive history, hereditary factors, passive smoking are more prominent than the other component like occupational exposure and dietary factor. The result of the present overview provides valuable insights and viewpoints toward the formulation of Breast cancer prevention procedures in Bangladesh. In 2015-2016 breast cancer was the leading cancer in female in Bangladesh. This study suggests the risk factor of cancer found is similar to reports from other part of the country and the world [22].

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