PREVALENCE OF LIFESTYLE AND DEMOGRAPHICS RELATED RISK ATTRIBUTES AMONG BREAST CANCER PATIENTS IN PAKISTAN.

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ABSTRACT: *Globally breast cancer in females is one of the most leading and frequent causes of mortality. Approximately one million women are diagnosed with breast cancer each year as it is the second cause of mortality among women aged 45-55 years. Both genetic and environmental factors are involved in breast carcinogenesis but environmental factors are more readily controlled. The objective of the current study was to investigate the prevalence of lifestyle-related risk attributes and clinical features of breast cancer patients in our Pakistani breast cancer subjects. A sample size of one hundred patients of breast cancer was collected from different hospitals of Lahore, Punjab while prior to the data collection an informed consent form was collected from the patients. The study results showed that the most common type of breast cancer in our Pakistani breast cancer patients was invasive ductal carcinoma which is 73% and the majority of patients are of grade 3 (43%). The age-wise distribution reveals that 46.66% patients are between 46-55 age group with 60% among individuals whose monthly income was 15000 to 25000 and highest among the cousin marriage population which was 60%. The present study results conclude the clinical features of breast cancer patients in our Pakistani population have that invasive ductal carcinoma cancer type and the majority of patients belong to grade 3. The demographic characteristics showed that it was more frequent in older age females, consanguineous marriages and rural and low-income patients.*

Keywords: Breast cancer; Lifestyle; Risk-factors; Clinical features.

INTRODUCTION

The term cancer refers to the uncontrolled spread and growth of cells [1]. Alterations that mainly occur in the DNA sequence of the genome of the cells ultimately lead towards the progression of cancer or tumor which is responsible for one in eight deaths globally [2]. Among women breast cancer is the most prevalent type of malignant neoplasm [3]. Its incidence varies as it is being the lowest in Asia and Africa while it is highest in North America and Western Europe [4]. Worldwide more than 1,000,000 cases occurring annually due to breast cancers among females [5] and one million women diagnosed with breast cancer every year [6]. Moreover, among women aged 45-55 years, it is the second leading cause of mortality [3].

Breast cancer is a heterogeneous disease comprising a number of distinct subtypes with varied behavior and clinical outcome [7]. The most common type of tissue, which is involved in breast cancer are the inner layers of milk glands or lobules and ducts tissues [3]. It is divided into three major types; invasive, non-invasive and others that are responsible for 1-4% of breast cancer include Paget's disease of the nipple [8]. It is classified into three major grades which are Grade I which is well-differentiated; Grade II is differentiated intermediary and Grade III which is poorly differentiated 45. According to the number of affected lymph nodes it is classified into Grade I with no lymph nodes affection, Grade II in which one to three lymph nodes are affected and when ≥4 lymph nodes it is the Grade III [9].

Breast carcinogenesis includes various genetic and environmental factors. However, as compared to the racial and genetic factors the environmental factors are more readily controlled [10]. There are various risk factors that include stress, family history, diet, especially which is rich in fat, smoking, and depression.[6] The most common symptoms which are associated with the onset of breast cancer include the appearance of lumps, compactness of dimple, redness, and soreness [9]. Genetic predisposition which is responsible for 5-10% of all breast malignancy is due to the mutations which are occurring in the autosomal dominant genes. The genetic variation which is involved in the development of breast tumor is of two broad types one is in proto-oncogene gain of function mutation while the other is the loss of function mutation in tumor suppresser gene which leads towards the disturbance of the checkpoints of cell cycle, uncontrolled cell growth, and division and DNA mechanism of repair failure. Due to the inherited loss of function mutation, there is a 70% risk of breast cancer development in women before the age of 70 years [10]. There are various genes in which the mutations can affect the body differently and thus results in the development of various types of breast neoplasm. The genes which cause 90% of breast cancer are the *BRCA1* and *BRCA2* while other are *PIK3, HER2* and *MDM2, RB* and *TPK53* deregulation of expression these three genes can play an important role in therapeutic vibes of breast tumor [9].

Screening mammography and multimodality treatment results in early detection thus have abridged the mortality due to this tumor in western countries; but in developing countries, it
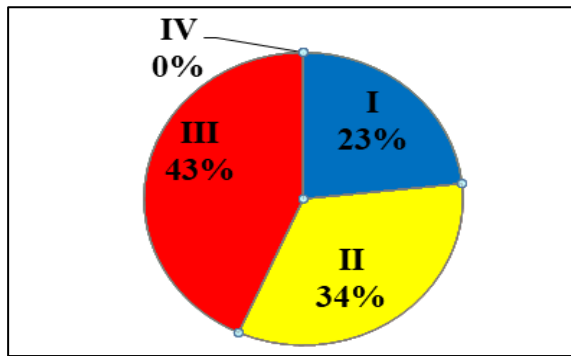
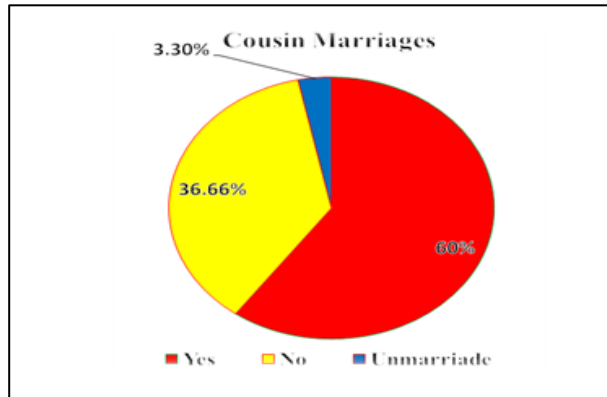**Figure 1: Age-wise distribution of breast cancer patients**

Figure 2: Percentage of patients according to grade of breast cancer/tumors

still continues to have a high prevalence [11]. In Pakistan, the ratio of developing breast tumors is rising at an alarming rate as it is 38.5% of other types of cancer. Moreover, during 1995-1997 the incidence of breast cancer reported 33.1% in the population of south district Karachi [6]. To, the best of our knowledge there is the lack of data regarding demographic features of breast tumor in Pakistani population thus present study was undertaken to determine its various features in our Pakistani population.

MATERIAL AND METHODS
A sample size of one hundred patients of breast cancer was collected from different hospitals of Lahore, Punjab. Prior to the data collection, an informed consent form was obtained from the patients. A structured questionnaire was designed to collect all the essential information regarding patient age, socioeconomic status, the patient grade of tumor and other associated information.

RESULTS
A structured questionnaire was designed for the collection of data from females suffering from breast cancer. A total of 100 responses was obtained which showed that the association of breast cancer with age and found to be highest among females having age between 46-55 years. The most commonly occurring type of cancer was invasive ductal carcinoma (73%) and the majority of subjects were having Grade III carcinoma (70%). Results have also shown a link between cancer and socioeconomic status.
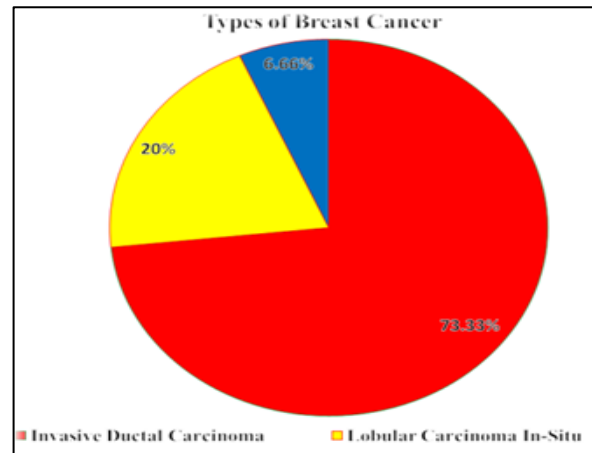

Figure 3: Types of breast cancer

The detailed outcomes of the study are as follows:
Age-wise distribution
Findings have demonstrated the age-wise distribution of breast cancer among different age groups as 46-55 years (46.66%) >56 years or above (30%) > 36-45(13.33%) > 26-35 (6.66%) and >15-25 (3.33%). From these results, it can be seen that the chances of developing breast cancer are amplified as the age is increased (Figure 1).
Grade wise distribution
The grade-wise data distribution results of this study
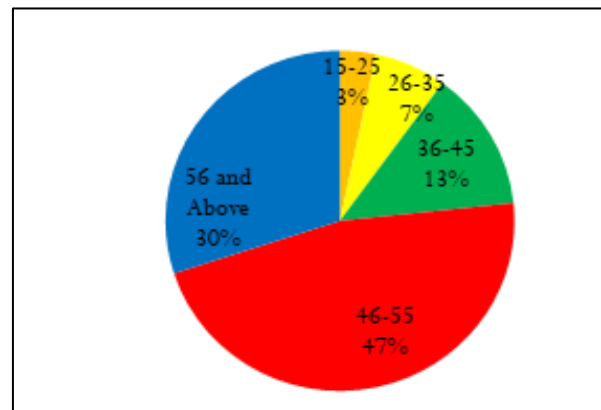

Figure 4: Link between breast cancer and marriage

(Figure 2) showed that the prevalence of grade III tumors is quite common (43%) followed by grade II (34%) > grade I (23%) and > grade IV (0%). The absence of grade IV tumors is may be due to decreased survival rate as compared to less progressive stages.
Percentage distribution of breast cancer types
Outcomes of the present study (Figure 3) have exhibited that the majority of the patients have invasive ductal carcinoma (73%). After that, the second most commonly occurring type was lobular carcinoma in-situ (20%) followed by the inflammatory ductal carcinoma (6.66%).
Family marriages
The findings of the study (Figure 4) have suggested that there is a high incidence of breast cancer among the **Association of**

breast cancers with lifestyle
The current study findings (Figure 5) have proposed that the prevalence of breast cancer is greater in rural areas (80%) as compared to urban areas (20%).

patients who wed to their cousins as compared to those who married not in family and unmarried people. The results are summarized as the rate of incidence of breast cancer and cousin marriages (60%) > non-cousins marriages (36.66%) > unmarried (3.33%).
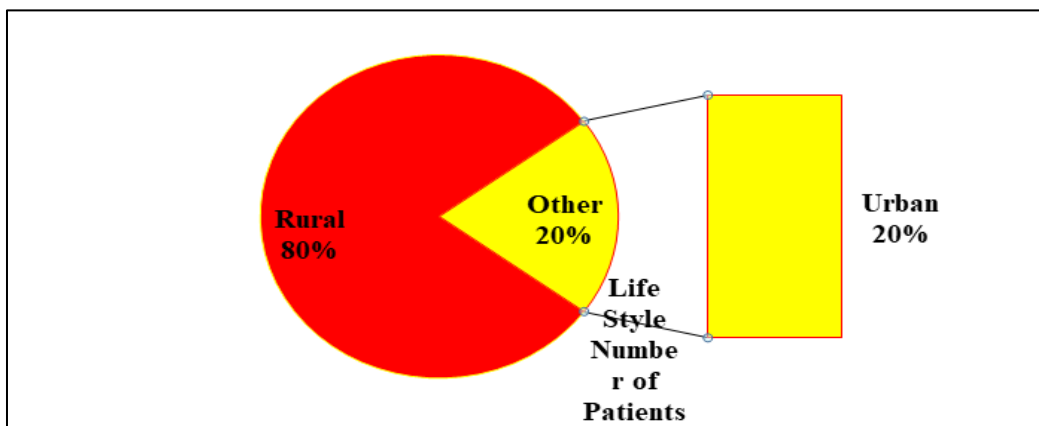

Figure 5: Association of breast cancer with lifestyle

Monthly income
These study results have shown that the breast cancer was found to be highest in persons who have poor wages and deprived living conditions (Figure 6). The rate of incidence

of breast cancer with its association to monthly income is as follows; 15000-25000Rs/- (60%) income per month > 25000-35000 Rs/-(30%) and > 36000Rs/- per month.
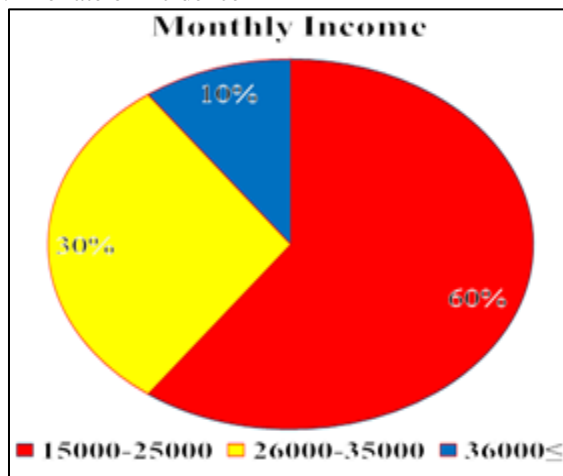

Figure 6: Monthly income of breast cancer patients

DISCUSSION
The current study is aimed to investigate the breast cancer demographic attributes among Pakistani breast cancer patients. That is the first-ever study to consider the demographic attributes of the Pakistani population suffering from breast cancer, as to the best of our knowledge no previous study was found regarding the same. From the study, it is shown that there are many aspects that can contribute to the development of breast cancer. The majority of the cancers (90-95%) are happening due to depriving living conditions; further environmental factors can contribute to the development of the tumors. The abnormality in hormones and mutation in genes is responsible for approximately 5 to 10 % in the development of the cancers [12]. Unhealthy living conditions, stress, smoking, prolonged exposure to radiations and lack of physical activity

play a vital role in the development of breast cancer [13]. Though the sample size is limited in the present study, it provides valuable information about the demographic features of breast cancer patients. The current knowledge can be useful in the improvement of health policy in Pakistan related to cancer and hence a number of patients can be reduced with improved quality of life, as these non-communicable diseases put a major burden on health [14]. The risk of having cancer is increased as the age is increased. The age-wise distribution of patients has suggested that the prevalence of breast cancer is greater in the age group 46-55 (46.66%) as compared to the other age sets. The high frequency of breast cancer patients among old females indicated that the probabilities of developing breast cancer in old will be raised as compared to young females. In the

United States of America (USA), nearly 3/4th of all the breast cancer befallen in the women aged 50 or more [15,16].

In a retrospective study which was conducted in Peshawar, Pakistan has described the prevalence of breast cancer among the female population of the Peshawar. About 3279 breast cancer cases were reported and the study suggested that the majority of the patients had invasive ductal carcinoma 37%, followed by fibroadenoma 16.95% which are in accordance with the current study as ductal carcinoma was found to be high 73.33% followed by lobular carcinoma 20%. Similarly, another study has shown that the majority of patients have grade II and III carcinomas [17]. The results of the present study have little differences from the outcomes obtained by Naeem and his colleagues. In this study, the most frequent tumor grade has been III (70%) followed by grade II and grade IV. Another study conducted by the researchers at the Aga Khan University Hospital, Karachi has retrospective analyzed the 572 mastectomy specimens and found that the mean age of the patients was 48 and the most common tumor was invasive ductal carcinoma (81%) [18], which supported the outcomes of the current study that invasive ductal carcinoma patients were the topmost in number (73.33%) and majority of the patients are of old age. Other studies have confirmed that there is a link between breast cancer and lifestyle. This includes obesity, diet, birth control, drink alcohol and hormone treatment. Studies have suggested that the relation between breast cancer and associated risk factors were based on the discrepancies in different living backgrounds and traditional diet [19].

The findings of the current study have suggested that breast cancer patients had the highest ratio of cousin marriages (60%) as compared to those who wed out of the family (36.66%) and the least number of patients were unmarried (3.33%). Though the heredities studies have recommended that cousin marriages should be eluded as most of the genetic diseases become transfer when parents have defective genes. Here, although all samples were sporadic without any family history of breast cancer, even in that case the cousin marriages had the highest ratio of breast cases. Further, lifestyle and living conditions have a great influence on wellbeing. This study indicated that the majority of the patients were from rural areas (80%) having low monthly income (60%) as compared to persons who belonged to city areas (20%) and having a good income (10%). Women from deprived areas have the worst 5-year survival rates than those as compared to those who belonged to a privileged family, irrespective of age, ethnicity or stage of cancer [20]. In general, early diagnosis can enhance the life expectancy rate because cancer is more curable when treated earlier stage before the spread of the tumor. Conversely, women from the unfortunate areas have lesser survival rates because of delays in early diagnosis and detection of diseases [21].

CONCLUSION

It is concluded from the present study that the invasive ductal carcinoma is the most common cancer type and the majority of patients suffered from grade III in Pakistani subjects. The demographic features show that breast cancer prevalence is quite common among older age females who marry their cousins and belong to rural areas and have low wages.

SUGGESTIONS FOR FUTURE RESEARCH

There should be proper awareness programs about breast cancer and different seminars should be conducted to inform the general population about signs and symptoms of breast cancer, its diagnosis and treatment and government should pay proper attention to increase the salary of low-income persons so that stress can be lessened and many diseases could be prevented. Cousin marriages should be avoided.

CONFLICTS OF INTERESTS

The authors have no conflicts of interest.

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