

## Review Article

# Incidence of Breast Cancer in the People of Hazara Division

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## Abstract

Carcinoma of breast is an uncontrollable abnormal proliferation of breast tissue. It is the most common female malignancy throughout the world including Pakistan. Worldwide, especially in developing countries, carcinoma of breast is the main reason of cancer caused deaths in females. This is also true for Pakistan where high incidence of breast cancer is mainly due to lack of awareness among the population and delayed diagnosis. Although, the exact cause of breast cancer is not known, however, genetic profile of an individual, cultural, environmental, and life-style factors may be associated with occurrence of the disease. Incidences of breast cancer have not been studied previously in the Hazara division of the country; therefore, the current study was designed to explore the incidences of breast cancer in the people of Hazara division by studying the reported cases at INOR (2004-14). Utilizing hospital data, Eight hundred and sixty seven (867) patients of breast cancer were clinically diagnosed including 840 (96.88%) females and 27 (3.11%) males from all districts of Hazara division. Highest prevalence was found for district Abbottabad, where 368 (42.45%) cases were recorded and lowest for district Kohistan, registering 12 (1.38%) cases. Patients were divided into nine age groups with the range of 10 years. Peak age for breast cancer was found 41-50 years. Majority of patients reported hospital in advanced stage of disease. Results showed that breast cancer from 2004-2014 remained the most prevalent cancer in the population of Hazara division. District Abbottabad was the most exposed area for occurrence of the breast cancer. The most common age group was 41-50, mostly including females. It is depicted from current study that breast cancer is the most commonly occurring cancer in women as compared to men. Patients were presented most commonly at stage III. Breast cancer shows highest frequency when compared with all other cancers.

**Keywords:** Breast Cancer; Incidence; Hazara Division; Pakistan; Cancer; Malignancy; Carcinoma

## Introduction and Review of Literature

### Breast cancer

The brand of syndromes in which the cellular proliferation does not persist in a regular way is called cancer. Normally cells in the body grow in a systematic way, proliferation and destruction goes side by side. When cells just proliferate and do not get destroyed as needed normally, it results in cancer. In other words disturbance in the process of apoptosis (programmed cell destruction) results in initiation of cancer [1]. Ordinary cells replicate in the same way as required and quit replication when further cells are not required any more. Normal cells become cancerous when they fail to follow the regular pattern of growth and death as required [2]. Thus cancerous growth from abnormal cells in the breast tissues is termed as breast cancer. Breast cancer occurs when malignant tumor develops from abnormal cells. There are two main types of breast cancer including lobular carcinoma and ductal carcinoma. Ductal carcinoma occurs in the ducts (passages) of mammary glands that deliver milk to the nipples while lobular carcinoma occurs when abnormal growth of cells starts in the milk producing glands (lobules) of the breast. Mostly carcinoma of breast starts in ducts or lobules of breast, however

sometimes cancer may also start in fibrous and fatty connective tissue, which is less common [1].

The breast cancer is an uncontrolled growth of tissues of breast; it is a most often diagnosed cancer worldwide. All females have risk of developing breast cancer despite the ethnicity or race [3]. Breast Cancer is exceptionally uncommon in males, in spite of the fact; they can likewise be affected with it [4]. Women of every geographic range, ethnicities, and races may be affected. Anyway variation on the bases of geographical region and ethnicity in breast cancer is a well-established fact [5,6]. The epidemiology, survival rates and clinical presentation differ in various geographic regions, and among various races and inside same geographic area [7,8,9]. High frequency and low death rate has been observed in the developed world, having 45% of all incidences and 55% of all mortality in these countries with lower and moderate income. Presentation in advanced stage in generally more youthful people is a trademark feature which is reported from the developed world [10].

Breast cancer can be diagnosed by general physical examination; radiographic imaging tests for example, mammogram, breast ultrasound, Magnetic Resonance Imaging (MRI), ductogram, biopsy,

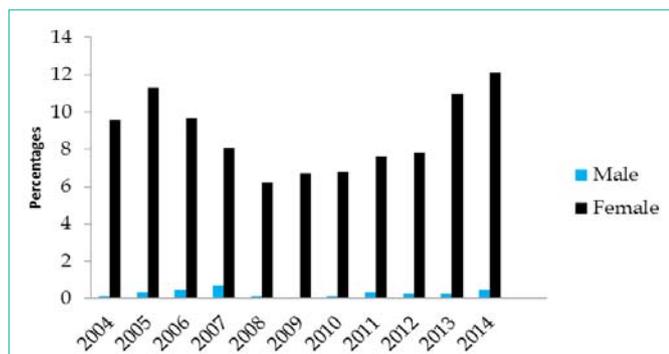


Figure 1: Year wise percentage of breast cancer among females and males of Hazara Division registered at INOR Abbottabad.

Table 1: Year Wise Incidences of Breast Cancer.

| Year  | Male n (%) | Female n (%) | Total n (%) |
|-------|------------|--------------|-------------|
| 2004  | 1 (0.12)   | 83 (9.57)    | 84 (9.69)   |
| 2005  | 3 (0.35)   | 98 (11.30)   | 101 (11.65) |
| 2006  | 4 (0.46)   | 84 (9.68)    | 88 (10.15)  |
| 2007  | 6 (0.69)   | 70 (8.07)    | 76 (8.77)   |
| 2008  | 1 (0.12)   | 54 (6.22)    | 55 (6.34)   |
| 2009  | 0          | 58 (6.69)    | 58 (6.69)   |
| 2010  | 1 (0.12)   | 59 (6.80)    | 60 (6.92)   |
| 2011  | 3 (0.35)   | 66 (7.61)    | 69 (7.96)   |
| 2012  | 2 (0.23)   | 68 (7.84)    | 70 (8.07)   |
| 2013  | 2 (0.23)   | 95 (10.95)   | 97 (11.19)  |
| 2014  | 4 (0.46)   | 105 (12.11)  | 109 (12.57) |
| Total | 27 (3.11)  | 840 (96.88)  | 867         |

a core biopsy, Excisional biopsy or vacuum assisted biopsy of breast and Fine Needle Aspiration and Cytology (FNAC) [11].

**Types of breast cancer**

Generally breast cancer is categorized either *in situ* or invasive.

**Carcinoma *in situ***

**Ductal carcinoma *in situ* (DCIS):** A pre-invasive, or non-invasive condition of breast in which irregular cells are seen in lining membranes of milk carrying ducts of the breast is called ductal carcinoma *in situ*. These irregular cells remained confined to the ducts and do not invade beyond into nearby breast tissue. It is termed as pre-invasive cancer [12].

**Lobular carcinoma *in situ* (LCIS):** Lobular carcinoma *in situ* depicts a non-invasive pre-carcinogenic condition that is limited to the glands of the breast which produce milk (lobules). Tumors named LCIS are comprised of tiny cells which do not leave the lobules [13].

**Invasive breast carcinoma (IBC)**

**Invasive lobular carcinoma (ILC):** Invasive lobular carcinoma grows inside lobules (mammary glands) of breast and can spread to different body parts, (most often brain, bone, lungs and liver) either through the circulatory system or the lymphatic pathway [14].

**Invasive ductal carcinoma (IDC):** The commonest type of

invasive breast carcinoma is invasive ductal carcinoma counts about 85% of cases. IDC begins in the milk carrying tubules called ducts and can spread to different parts of the body (most often brain, bone, lungs and liver) either through the circulatory system or the lymphatic framework. Females beyond 40 years of age have an expanded risk to develop invasive ductal carcinoma, with around half of cases happening in females beyond 65 years of age [14].

**Receptors involved in breast cancer**

There are some receptors present at the surface, cytoplasm and nucleus of breast cancer cells, for example, Progesterone Receptor (PR), Estrogen Receptor (ER) and HER2. Synthetic messengers for example, hormones tie to receptors, and changes are produced in cells. Cells of cancer that have receptors for estrogen such as ER+ rely for their development upon estrogen. Breast cancer cells which do not contain any one of above mentioned three receptors are termed as triple negative breast cancer, despite the fact that they often have receptors for other different hormones for example receptor for prolactin and [15].

**Signs and symptoms**

When a hard marginalized mass (lump) appears, it is the first well known sign of breast cancer. One of the breasts getting to be bigger or lower, clear or bloody discharge from nipple or its retraction, a rash close by an areola, regular pain in axilla or breast, and oedema in axillary portion or in clavicle bone area may be signs and symptoms of breast cancer [16].

**Risk factors**

The breast cancer risk has relation with many lifestyle factors [17]. Known risk factors are: diet, lifestyle, factors involving reproduction, socio-demographic profile and anthropometric status [18].

**Genetic factors:** In breast carcinogenesis, numerous genetic factors play important role [19].

**Genes involved in breast cancer:** BRCA1 and BRCA2 are the main genes involved in breast cancer [20].

**Gender association with breast cancer:** Being women is the man risk factor to develop breast cancer .Female hormones such as progesterone and estrogen are to some degree responsible for expanded vulnerability of female to develop breast cancer [21]. Faraz et al., (2010) investigated contribution of BRCA1 gene (responsible for greater part of women breast cancers) in sporadic cancer of breast patients, particularly in Pakistani inhabitants [22]. Alteration in

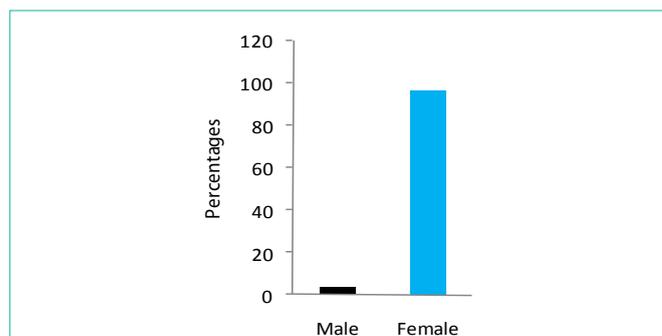
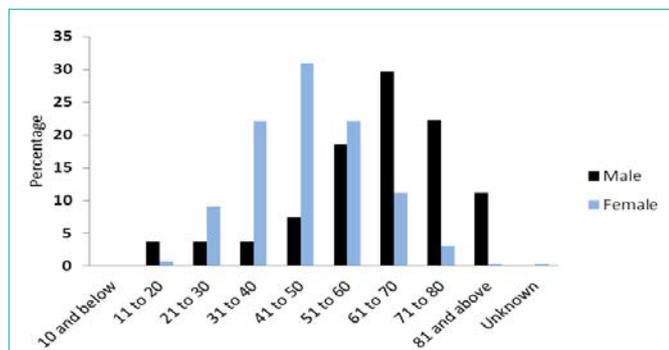


Figure 2: Gender wise incidences of breast cancer in the human population of Hazara Division, Pakistan.

**Table 2:** Gender Wise Incidences of Breast Cancer.

| Gender | Breast Cancer n (%) |
|--------|---------------------|
| Male   | 27 (3.11)           |
| Female | 840 (96.89)         |
| Total  | 867                 |



**Figure 3:** Age wise incidences (%) of breast cancer among human population of Hazara Division.

**Table 3:** Age Wise Incidences of Breast Cancer.

| Age groups | Male n (%) | Female n (%) | Total n (%) |
|------------|------------|--------------|-------------|
| ≤ 10       | 0          | 1 (0.12)     | 1 (0.12)    |
| 20-Nov     | 1 (3.7)    | 6 (0.71)     | 7 (0.81)    |
| 21–30      | 1 (3.7)    | 76 (9.05)    | 77 (8.88)   |
| 31–40      | 1 (3.7)    | 186 (22.14)  | 187 (21.57) |
| 41–50      | 2 (7.41)   | 260 (30.95)  | 262 (30.22) |
| 51–60      | 5 (18.52)  | 186 (22.14)  | 191 (22.03) |
| 61-70      | 8 (29.63)  | 94 (11.19)   | 102 (11.76) |
| 71-80      | 6 (22.22)  | 25 (2.98)    | 31 (3.58)   |
| ≥ 80       | 3 (11.11)  | 3 (0.36)     | 6 (0.69)    |
| Unknown    | 0          | 3 (0.36)     | 3 (0.35)    |
| Total      | 27         | 840          | 867         |

tumor suppressor genes BRCA1 and BRCA2 is the most dominant cause of breast cancer [20] and 16% of all inherited carcinoma of breast is caused by alteration in BRCA1 and BRCA2 [23].

**Hormonal factors:** Increased level of endogenous estrogen is connected with an expanded risk of breast cancer. Early menarche, nulliparity, later age at first pregnancy and delayed menopause raises risk of developing carcinoma of breast apparently by raising endogenous estrogen levels. Initially it was thought that Oral Contraceptives (OCP) may slightly increase the risk of breast cancer, but later researches do not confirm this relation [24]. Randomized investigations of Hormone Replacement Therapy (HRT) in postmenopausal females demonstrated incidences of breast cancer increase with HRT, especially when a combination of estrogen and progesterone is used. In the Women’s Health Initiative trial, there was a 1.24 time higher risk with combined progesterone and estrogen yet there is not any intensified risk with estrogen-alone formulas [25].

**Environmental risk factors**

**Climatic influence:** Vast variety of breast cancer occurrence

within the various areas of the world might be due to genetic differences among the population or varying lifestyle which include environmental exposures and diet. Incidences in the breast cancer show a remarkable variation due to geographical and environmental change. This highlights the crucial involvement of socio-cultural and environmental factor to the risk of breast cancer [26].

**Age:** Reportedly, breast cancer is less likely to occur before 25 years of age and its increase is seen up to 100 times by 45 years of age [27]. This pattern recommends that the reproductive hormones are involved in the development of breast cancer [28].

**Dietary habits**

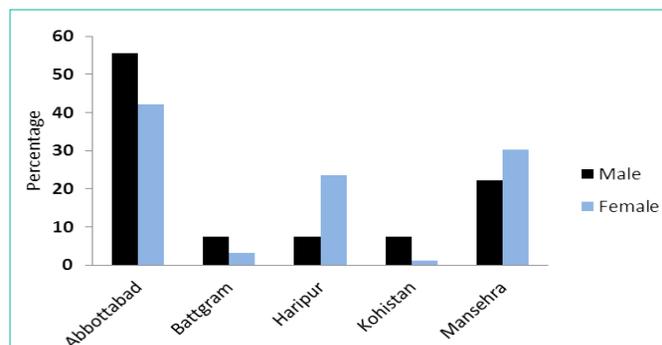
**Dietary carcinogens:** Our diet contains an extraordinary assortment of organic and inorganic carcinogens [29]. It is reported that high intake of fat, particularly unsaturated fats, has an expected association with amplified breast cancer risk [30].

Eating vegetables and fruits, which are the rich sources of organic anti-oxidants, has been appeared to reduce cancer risk generally, and breast cancer specifically, in various studies [31].

**Alcohol consumption:** Various epidemiological investigations discovered a positive relationship between alcohol consumption and the risk of evolving breast cancer in postmenopausal females with a general risk for 1.6 [32]. The risk increments goes linearly in a dose dependent way up to a drink of 60g (approx.2-5 drinks)/day. For each 10g increase (about. 0.75-1 drink)/day intake of alcohol, the risk increment goes to 9% [33]. Liquor can act by implication through its first metabolite, acetaldehyde, a very much portrayed cancer-causing agent and mutagen, and or can be a tumor promoter, leads to improved pro-carcinogen activation [34].

**Obesity and physical activity:** Obesity has a complex association with breast cancer risk that is by all accounts, regulated by menopausal status. A number of studies conducted both in the Europe and US have presented that weight gain and obesity multiply breast cancer risk [35-38]. Breast cancer risk increases up to 8% with increase of every 5kg wait [39].

**Mammographic density association with breast cancer:** Mammographic density is another important risk factor for breast cancer occurrence in both pre-menopausal and post-menopausal females. According to Canadian National Breast Screening Study and Breast Cancer Detection Demonstration Project [40] females



**Figure 4:** District wise incidences of breast cancer among human population of Hazara Division.

**Table 4:** District Wise Incidences of Breast Cancer among Human Population of the Study Area.

| Districts    | Male n (%) | Female n (%) | Total n (%) |
|--------------|------------|--------------|-------------|
| Abbottabad   | 15 (55.56) | 353 (42.02)  | 368 (42.45) |
| Battagram    | 2 (7.41)   | 26 (3.1)     | 28 (3.23)   |
| Haripur      | 2 (7.41)   | 197 (23.45)  | 199 (22.95) |
| Kohistan     | 2 (7.41)   | 10 (1.19)    | 12 (1.38)   |
| Mansehra     | 6 (22.22)  | 254 (30.24)  | 260 (29.99) |
| <b>Total</b> | <b>27</b>  | <b>840</b>   | <b>867</b>  |

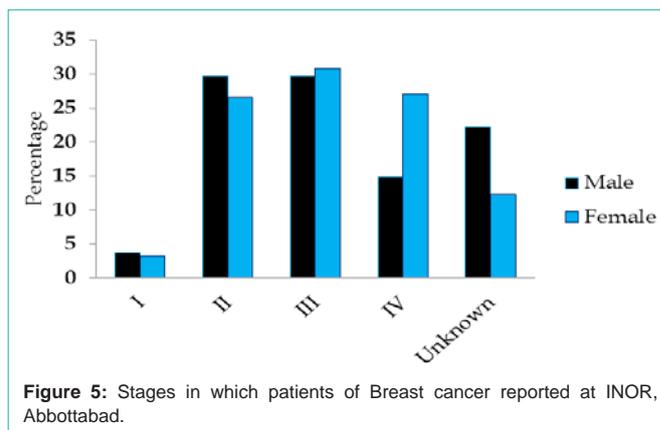
with more than 75% expended breast density on mammography have roughly five times increased risk to develop breast cancer compare to females with under 55% expended density of breast. Both pre-menopausal and post-menopausal nulliparous females and in addition slimmer females having higher breast density might be at higher risk to develop breast cancer [41]. High breast density and nulliparity appear to act synergistically since the breast cancer risk increase up to seven times when both are present in an individual [42].

**Global status of breast cancers**

According to [43] globally about 23% of all cancer is breast cancer. According to W.H.O estimates globally 1.2 million population is identified to have carcinoma of breast each year [44]. In 2004 carcinoma of breast caused 519,000 deaths throughout the world [45]. Breast cancer is commonest cancer in females all over the world including developing and developed countries [46,47]. In 2012 world widely 1.7 million females were identified with breast cancer and the breast cancer was most frequently reported carcinoma among females in 140 out of 184 countries around the world. Breast cancer incidences increase continuously both in developed and developing countries [48]. Moving forward to advance life style is key factor in the abrupt increase in the breast cancer occurrence in developing countries [49]. Now a day above 50% of cases occurs in the developing countries [50]. In India about 145,000 new cases of breast cancer are identified and cause 70,000 deaths every year. This rate of breast cancer is higher than any other cancer among both genders [48]. A number of studies in India show an abrupt increase in the occurrence of breast cancer [51].

**Breast cancer incidences in Pakistan**

One in each nine Pakistani females (1/9) experiences breast cancer that falls in the most elevated occurrence ratio in Asian population [52]. According to [53] during a study at SKMCH carcinoma of breast reported 21.5% of all cancer patients and about 45.9% of female cancers. In Pakistan breast cancer occurrence ratio is very high comparing to western societies [54]. In Pakistan about 38% of malignancy is breast cancer in Karachi which accounted 33% in women [55]. In Pakistan frequency of breast cancer is 34.6% and it is 2.5 folds greater than nearby countries such as Iran and India, and shows widest occurrence of breast cancer as compared to any population in Asia [56]. During a study of data collection by Agha Khan University, to estimate the occurrence of male breast cancer, 213,377 surgical samples were registered during the period of 10 years, out of which 53,012 samples were found as carcinoma of breast and just 51 (0.096%) cases of male breast cancer [55]. Moreover [57],



**Figure 5:** Stages in which patients of Breast cancer reported at INOR, Abbottabad.

**Table 5:** Stages in Which Patients of Breast Cancer Reported At Inor.

| Stages       | Male n (%ages) | Female n (%ages) | Total n (%ages) |
|--------------|----------------|------------------|-----------------|
| I            | 1 (3.7)        | 27 (3.21)        | 28 (3.23)       |
| II           | 8 (29.63)      | 223 (26.55)      | 231 (26.64)     |
| III          | 8 (29.63)      | 259 (30.83)      | 267 (30.8)      |
| IV           | 4 (14.81)      | 227 (27.02)      | 231 (26.64)     |
| Unknown      | 6 (22.22)      | 104 (12.38)      | 110 (12.69)     |
| <b>Total</b> | <b>27</b>      | <b>840</b>       | <b>867</b>      |

conducted a study in north area of Pakistan and found 141 patients with male breast cancers during the period of 10 years (1992-2001).

Incidences of breast cancer have not been explored previously in Hazara division so it is needed to assess the exact ratio of breast cancer existing in the region. For collecting information about breast malignancy, a cancer care center (Institute of Nuclear medicine Oncology and Radiotherapy (INOR) in the capital city (Abbottabad) of this division was approached. Therefore, the current study was designed under the following objectives:

- To know the incidence of breast cancer in patients visiting INOR.
- To know the relationship of socio-demographic and environmental factors with breast cancer occurrence.

**Materials and Methods**

**Study area**

Hazara division is one of the seven divisions of Khyber Pakhtunkhwa province of Pakistan. It was established in 1970 by splitting the Peshawar division and adding two attached Tribal Agencies. It is located in the North-Eastern region of Khyber Pakhtunkhwa. There are six districts in Hazara division namely, Abbottabad, Battagram, Haripur, Kohistan, Mansehra, and Torghar. Abbottabad is the capital city of Hazara division. District Abbottabad has an area of 1802km<sup>2</sup> and 2 million population, district Haripur has 1763km<sup>2</sup> area and 1 million population, district Mansehra has 5057km<sup>2</sup> area and 2.4 million population, district Kohistan has 7581km<sup>2</sup> area and 0.8 million population, district Battagram has 1310km<sup>2</sup> area and 1 million population and district Torghar has 4579km<sup>2</sup> area and 0.5 million population. As district Torghar was newly established in 2012, previously it was a part of district Mansehra. Separate data

for district Torghar from 2004 to 2012 were not available. Therefore Torghar was considered as a part of district Mansehra for the purpose of this study (<http://kpktribune.com/index.php/en/hazara> Dec 2015). Institute Of Nuclear Medicine, Oncology and Radiotherapy (INOR), is located in the capital city of Hazara division, Abbottabad. This was established in 2004 under the umbrella of Pakistan Atomic Energy Commission (PAEC).

**Study design**

Present study was designed to collect data about Breast Cancer patients registered at INOR for 11 years retrospectively, since January 2004 to December 2014. The year wise data was recorded from patient’s history files. Data collection was made through planned questionnaires. The included parameters in the questionnaire were RT No, Patient Registration (PRN) No, name, father name, age, gender, Date of Reporting (DOR), disease, district, division, disease group and stage.

**Data analysis**

All the retrieved data was entered in Microsoft access database. Incidences of breast cancer were calculated using basic statistical operations and arranged the data in tabular and graphical form.

**Results**

**Year wise incidences of breast cancer**

There were total 867 cases of breast cancer, out of which 840 (96.88%) involved females while only 27 (3.11%) cases were of male breast cancer registered at INOR. Breast cancer was found the commonest cancer in females as compared to males. The highest incidences of male breast cancer were observed in 2007 which were 0.69% of all breast cancer and 22.22% of male breast cancer cases. While the highest incidences of female breast cancer were observed in 2014 which were 12.11% of all breast cancer and 12.50% of female breast cancer cases. Lowest incidences of female breast cancer were observed in 2008 which were 6.22% of all breast cancer and 6.42% of female breast cancer cases. While there was no male breast cancer case found during 2009 (Table 1 and Figure 1).

**Gender wise incidence of breast cancer**

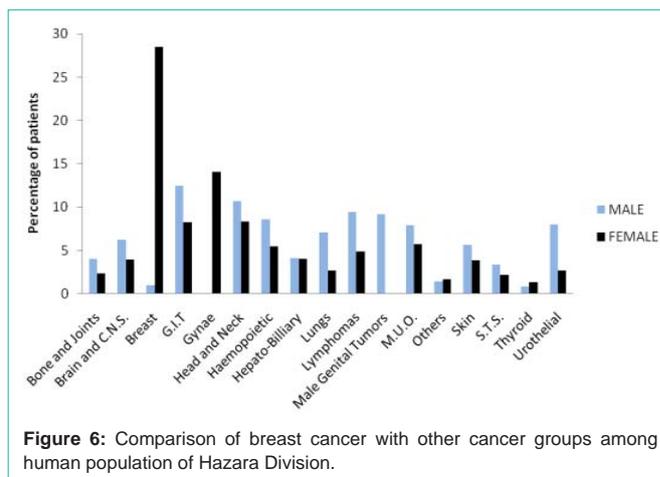
Results of our study depict that out of total 867 breast cancer patients 840 (97%) were females and 27 (3%) were males. Breast cancer reported as the most commonly occurring cancer in women compared to men (Table 2 and Figure 2).

**Age wise incidence of breast cancer**

Breast cancer patients were divided into nine groups i.e. 0-10, 11-20, 21-30, 31-40 , 41-50, 51-60, 61-70, 71-80 and >80 years of age. In our study breast cancer incidences are very low (0.12%) before the age of 25 years and increases up to 100-fold by the age of 45 years (30.22%). The peak age of female’s breast cancer was 41-50 years. While the highest incidences (29.63%) of male’s breast cancer were found during 61-70 years of age. Breast cancer incidences occur between the ages of 18-90 yeas (Table 3 and Figure 3).

**District wise incidence of breast cancer**

According to data accessible, highest incidences of breast cancer were found in district Abbottabad, which were 368 cases (42.45%), and lowest incidences were found for district Kohistan 12 cases



**Figure 6:** Comparison of breast cancer with other cancer groups among human population of Hazara Division.

**Table 6:** Comparison of Breast Cancer with Other Cancer Groups.

| Cancer Groups       | Male n (%)  | Female n (%) | Total n (%) |
|---------------------|-------------|--------------|-------------|
| Bone and Joints     | 112 (4.04)  | 69 (2.34)    | 181 (3.16)  |
| Brain and C.N.S.    | 173 (6.24)  | 117 (3.97)   | 290 (5.07)  |
| Breast              | 27 (0.97)   | 840 (28.5)   | 867 (15.16) |
| G.I.T               | 345 (12.45) | 243 (8.25)   | 588 (10.28) |
| Gynae               | 0           | 415 (14.08)  | 415 (7.26)  |
| Head and Neck       | 296 (10.68) | 246 (8.35)   | 542 (9.48)  |
| Haemopoietic        | 238 (8.59)  | 161 (5.46)   | 399 (6.98)  |
| Hepato-Biliary      | 114 (4.11)  | 119 (4.04)   | 233 (4.07)  |
| Lungs               | 196 (7.07)  | 80 (2.71)    | 276 (4.83)  |
| Lymphomas           | 261 (9.42)  | 143 (4.85)   | 404 (7.06)  |
| Male Genital Tumors | 255 (9.2)   | 0            | 255 (4.46)  |
| M.U.O.              | 219 (7.9)   | 168 (5.7)    | 387 (6.77)  |
| Others              | 40 (1.44)   | 49 (1.66)    | 89 (1.56)   |
| Skin                | 157 (5.66)  | 115 (3.9)    | 272 (4.76)  |
| S.T.S.              | 93 (3.35)   | 64 (2.17)    | 157(2.75)   |
| Thyroid             | 23 (0.83)   | 39 (1.32)    | 62 (1.08)   |
| Urothelial          | 223 (8.04)  | 79 (2.68)    | 302 (5.28)  |
| <b>Total</b>        | <b>2772</b> | <b>2947</b>  | <b>5719</b> |

(1.38%) of breast cancer (Table 4 and Figure 4).

**Incidence based on stages of breast cancer**

The patients are reported in stage I, II, III and IV of breast cancer. Frequency of stage III was found the highest 267 out of 867 (30.8%) cases followed by Stage II and IV 231 out of 867 (26.64%) cases each. While only 28 (3.23%) patients reported in stage I (Table 5 and Figure 5).

**Comparison of breast cancer with all other cancers**

During observed 11 years of study when breast cancer cases were compared with all other cancer cases, it was found that breast cancer was most commonly occurring cancer in population of Hazara division. Total cases of breast cancer were 867 (15.16%) out of 5719 followed by Gastro-Intestinal Tract (GIT) cancer with 588 (10.28%) out of 5719 cases in both sexes. Breast cancer was observed on the top

among females when compared to other groups of cancer with 840 (28.5%) out of 2947 cases while male breast cancer was 27 (0.97%) out of 2772 cases (Table 6 and Figure 6).

## Discussion

Breast cancer is a frequently diagnosed cancer in women all over the world. Its frequency ratio is 38.9, comprising one fourth of all cancer incidences all over the world [58]. Globally 1.2 million patients are identified to have breast cancer annually according to WHO accounts [44]. Breast cancer representing 23% of all cancers [43]. Occurrence of breast cancer in Pakistan is 2.5 fold greater than nearby countries; Iran and India, it shows the highest occurrence of breast cancer for any of Asian countries [56]. In Pakistani societies breast cancer is much common at the young age, which is in contrast to Western societies where it is commonly seen in old age (after 60 years) [59]. A study conducted at Institute of Nuclear Medicine Oncology Lahore (INMOL) by [60] showed 100:2 as women to men ratio.

Present study has shown that breast cancer remains the most prevalent cancer in the population of Hazara division from 2004-2014. District Abbottabad has been found the most exposed area for the occurrence of breast cancer. The most common age group was 41-50. It is depicted from our study that breast cancer is the most commonly occurring cancer of women compared to men. Patients presented most commonly in stage III. Breast cancer shows highest frequency when compared with all other cancers.

Disease shows dominance in the population of district Abbottabad (42.45%) of the Hazara division and very few people were affected by the disease in district Kohistan (1.38%).

Present results demonstrated that gender of the patient is a significant factor regarding the occurrence of breast cancer; it was found that females (96.89%) were more susceptible for getting the disease than males (3.11%). The findings are in agreement with [57,61] who have also advocated the occurrence of breast cancer most commonly in women compared to men.

In present study it was observed that breast cancer represents 15% of all cancers which is lesser occurrence compared to rest of the world which represents 23% [43]. It was noted that among women cancer patients 29% women were found with breast cancer which represents one out of three female cancer patients have breast cancer which shows that the trend of breast cancer is increasing in Pakistan. Previously one in five female diagnosed with cancer was a breast cancer patient [62].

The current study showed that male breast cancer is much common in Hazara when comparing with rest of the world. Present study show male to female ratio 1:32 while it is 1:82 in the world [3]. It is observed that breast cancer is a commonest malignancy in women as compared to men in Hazara division. This statement is also supported by [4].

It was noted that most commonly patients in Hazara division reported to cancer center were at stage III (30.8%), stage II, and IV (26.64%) each, which means that the patients reported disease at the advanced stages which represents the lack of awareness among the population. Gilani GM has also highlighted the presentation of breast

cancer in late stages in a study at INMOL and SHMCH [62]. Poor survival of patients is associated with delay in diagnosis of breast carcinoma according to a study conducted by [63]. It is observed in many International researches conducted in Germany USA, India, and Malaysia that breast cancer is commonly detected in early stages because of better screening programs [47,64-67].

Present study depicts that females of the middle age group (41-50 years) are at the higher risk of getting breast cancer (30.22%) followed by 51-60 years (22.03%) and 31-40 years (21.57%). These results have supported by [68] who has observed that 30-50 years age group female to be most common for developing breast cancer [69,70] have also observed that the disease to be most common in the middle age group which is 40-59 years. Present findings regarding peak age for breast malignancy are also supported by [27,28].

## Conclusions

It is concluded from the present study that the trend of breast cancer in Hazara division is alarming. It is the most commonly occurring female cancer in the study area. It is consequential from the results that breast cancer is the more prevalent in the advanced areas compared to backward areas. The disease is presented in the advanced stage and the most common age group was 41-50. Lack of awareness and socio-economic factors are playing very prominent role in increasing incidences of breast cancer.

## Recommendations

- In Pakistan present study can provide a leading role/base line data for future planning, treatment and prevention regarding breast cancer.
- Women in Pakistan get carcinoma of breast at younger age compared to western countries, therefore, at the national level there should be an effective screening programs for early detection of disease. It will helpful in prevention of disease.
- To start an effective awareness campaign and screening program is suggested at the grass root level throughout Hazara division.

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