

## Research Article

# Epidemiology and Clinical Profile of Breast Cancer in Central Nepal

Jenesh Singh Shrestha<sup>1\*</sup>, Alish Shrestha<sup>2</sup>, Samip Shrestha<sup>3</sup>, Sudip Shrestha<sup>4</sup>, Tilak Raj Sharma<sup>5</sup>, and Robin Maskey<sup>6</sup>

<sup>1</sup>Intensive Care Unit, Nepal Cancer Hospital and Research Center, Nepal

<sup>2</sup>Department of Internal Medicine, BPKIHS, Nepal

<sup>3</sup>Intensive Care Unit, Nepal Cancer Hospital and Research Center, Nepal

<sup>4</sup>Head of Medical Oncology Unit, Nepal cancer hospital and research center, Nepal

<sup>5</sup>Department of Internal Medicine, BPKIHS, Nepal

<sup>6</sup>Department of Internal Medicine, BPKIHS, Nepal

**\*Corresponding author**

Jenesh Singh Shrestha, Nepal Cancer Hospital and research Center(ICU), Hrisiddhi, Lalitpur, Kathmandu, Bagmati, Nepal, Tel: +977-9842349528, + 1-513908548, Email: jeneshshrestha8671@gmail.com

Submitted: 17 November 2016

Accepted: 05 December 2016

Published: 06 December 2016

**Copyright**

© 2016 Shrestha et al.

**OPEN ACCESS****Keywords**

- Breast cancer
- Clinical profile
- Epidemiology

**Abstract**

In this study, our objective was to determine the epidemiological and clinical profile of breast cancers. Different Literatures have highlighted the correlation between stage and age at diagnosis, size and age at diagnosis, correlations of different hormone receptor status with different age group etc. but precise documentation is lacking in Nepal.

**Methods and Materials:** The study was conducted at department of medical oncology, Nepal cancer hospital and research center from Dec 2014 to June 2016 and 183 patients diagnosed with breast cancer were enrolled. A retrospective cross-sectional study was conducted.

**Results:** Prevalence of breast cancer was 5.59 %. Newar was the most affected ethnic group. The most frequent age group was 40 to 49. The most common symptom was mass in 80 % of patients. Stage II (49.1 %) was the most common stage at diagnosis. 83% patients had a tumor size of 2-5 cm with average size of 3.25 cm at presentation. Younger women with cancer had a strong correlation with ER-ve/PR-ve and Her-2/Neu+ve receptor status with  $P < 0.05$ . Triple Negative receptor status was 32.87 %. Her2/neu +ve receptor status cancer was 39.72%.

**Conclusion:** Majority of patients presented with Stage IIa and IIIa disease breast cancer. Disease is more aggressive and diagnosed at a more advanced stage in younger women. Younger women had a strong correlation with ER-ve/PR-ve and her-2/neu +ve receptor. Recommendation for the Her-2/Neu receptor test should be done in every case of breast cancer. Triple negative status was lower in comparison to the previous studies which is favorable for hormonal antibody treatment implementation.

**ABBREVIATIONS**

ER: Estrogen Receptor; PR: Progesterone Receptor; Her-2/Neu: Human Epidermal Growth Factor Receptor; TNM: Tumor Node Metastasis; AJCC: American Joint Committee on Cancer

**INTRODUCTION**

Cancer is a group of disease that causes cells in the body to change and grow out of control [1]. These are neoplastic disorders caused due to excessive proliferation of cells. Cancer is one of the most dreaded non-communicable diseases that have made them most important contributor to the global burden of disease [2]. Since, Cancer is a multi-cellular disease that causes excessive proliferation of cells; continual future research on cancer trends is warranted to study the actual cancer scenario.

**Background**

**Worldwide scenario:** Breast cancer ranks as the fifth cause of death from cancer overall (522,000 deaths) and while it is the most frequent cause of cancer death in women in less developed regions (324,000 deaths, 14.3% of total), it is now the second

cause of cancer death in more developed regions (198,000 deaths, 15.4%) after lung cancer.

The incidence of breast cancer varies markedly from country to country being highest in United States and Northern Europe and lowest in Asia. In developed countries the incidence of breast cancer is more than 1000 per million, whereas in developing countries, it is less than 200 per million women. However, cancer mortality is higher in developing countries than in the developed countries [3]. The mortality rates are less than that for incidence because of the more favorable survival of breast cancer in (high-incidence) developed regions, with rates ranging from 6 per 100,000 in East Asia to 20 per 100,000 in Western Africa [4].

In Western Europe also, breast cancer incidence has reached more than 90 new cases per 100,000 women annually, compared with 30 per 100,000 in East Africa. In contrast, breast cancer mortality rates in these two regions are almost identical, at about 15 per 100,000, which clearly points to a later diagnosis and much poorer survival in eastern Africa. An urgent need in cancer control today is to develop effective and affordable approaches to the early detection, diagnosis, and treatment of breast cancer

among women living in less developed countries,” explains Dr Christopher Wild, Director of IARC. “It is critical to bring morbidity and mortality in line with progress made in recent years in more developed parts of the world [5].

In developing countries, patients have limited access to screening, or any effective awareness programs and consequently advanced disease. Thus, the growing incidence of breast cancer worldwide stresses the greater need for a study of its rise and the need for awareness about it in developing nations.

**Scenario in Nepal:** According World Health Organization (2008) breast cancer accounts for 6% of all cancers in Nepal. The commonest age group of women with breast cancer in Nepal is 40 – 50 years. This is a remarkable difference in higher incidence of younger than 50 years age [6].

Latest data of WHO data published in 2011, breast cancer death in Nepal has reached 1,248 or 0.84% of total deaths. The age adjusted death rate is 12.92 per 100,000 of population. Nepal ranks number 142 in the world [7].

According to Singh YP, Sayami P in management of cancer in Nepal, cancer education, screening and early detection are the key elements to influence the diagnosis, treatment and prognosis of breast cancer also it can be cured in the majority of the cases, if diagnosed early stages [3] but the Hospital record shows that Nepali women reach to get medical help when the disease is already in an advanced stage [8].

In our study; we attempted to make epidemiological observation of breast cancer patients in one of the major tertiary care hospital for cancer treatment in the central region of Nepal. The distribution of breast cancer based on the basis of ethnicity, age, duration, sex and clinical profile was recorded. Few studies have been done signifying the importance of hormonal receptor status in breast cancer worldwide, including Nepal [12] but here we focused to understand the association between ER/PR/Her-2 receptor status with age, aggressiveness (stage and size) of disease with age, prevalence of triple negative status, Her-2/receptor status, ER/PR status for the better implication of hormonal treatment and screening in appropriate group.

## MATERIALS AND METHODS

A retrospective cross-sectional study was conducted.

### Study site

The study was conducted at the Nepal Cancer Hospital and Research Center. The collection of data was done by the in-patient medical record files of breast cancer patients who were registered at the hospital from December 2014 to June 2016.

### Data collection

A modified data collection form was used to collect the information.

### Operation Modality

The in-patient record files were obtained from the hospital and the specified fields in the form were filled. The data collection was performed by all the members of the research group and was cross checked with one another for any missed information.

183 diagnosed cases of breast cancer attending the oncology outpatient department were consecutively enrolled. Patients with an inconclusive diagnosis were excluded. Detailed history, clinical examination and necessary investigation reports was recorded. Histological features including receptor status were recorded. Tumor Node Metastasis (TNM) staging system was as per American Joint Committee on Cancer (AJCC), sixth edition [9]. There was no any direct patient contact or interview during the research. Data was entered into the Excel and later test of significance was applied as required. Analysis was done in SPSS [13].

### Sample Size

183 diagnosed cases of breast cancer were registered.

## WORKING DEFINITION

Younger women = Women less than 50 years old; ER: Estrogen Receptor; PR: Progesterone Receptor; Her-2/neu: Human Epidermal Growth Factor Receptor; Large Tumor: >5 cm size

## RESULTS AND DISCUSSION

183 cases of diagnosed breast cancer were registered in our hospital from Dec, 2014 to June, 2016.

### Prevalence and Ethnicity

In our study, among 3270 total cancer patients 5.59% (183 patients) had breast cancer. Newar was the most effected ethnicity with 40% of the total cases which was comparable to similar study done in the central part of Nepal [10]. The study revealed that cancer prevalence, among the various ethnic groups, was highest in the Newars followed by a Bahun and Chettri together. This could be attributed to the fact that the majority of local inhabitants of the Kathmandu, Lalitpur area is Newars and their proximity to the NCHRC is more so that they can easily make

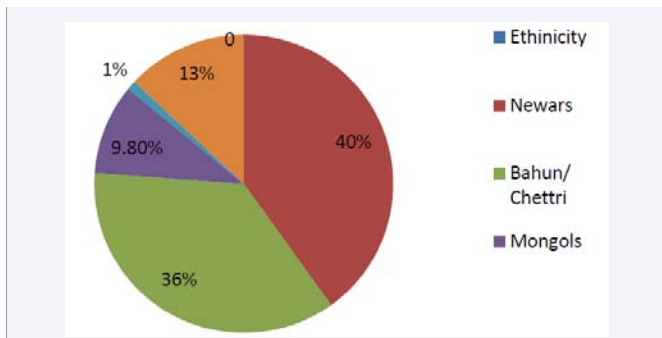
Frequent visits. On the other hand, Bahuns and Chettris together was the occupying second rank and was not unexpected standings; this is because of the fact that the most recent census statistics of Nepal shows prevalence of Bahuns and Chhetris as top two ethnicities (Figure 1).

### Age

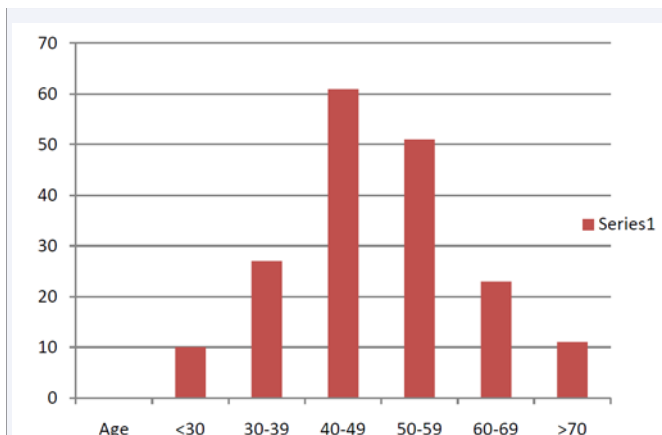
The largest age group affected was pre-menopausal. Among them mean age of patients was 49 years with (1 standard deviation = 11.16). Age range 40 to 49 was the most affected age group. The minimum age was 22 years and the maximum was 82 years and median age was 48. Out of 183 patients, 61 patients (33.33%) were 40 to 49, 51 patients (27.86%) were 50-59, and 23 patients (12.56%) were 60-69, comparable to WHO data on the Nepal breast cancer status [6] (Figure 2).

### Site, Size and the first symptom

Left sided breast (51%) cancer was more common, followed by right sided (44%) and bilateral (4%). This result is comparable to the result of the similar study done in India [11] where left sided cancer was more common than right sided. Also, 83% of



**Figure 1** Distribution of breast cancer, according to ethnicity (Decimals are rounded off to the nearest whole number).



**Figure 2** Age wise distribution of breast tumor.

the patients had a tumor size of 2-5 cm with average size of 3.25 cm which was comparable to a study done Nepal [12]. There was an earlier presentation of breast cancer in the central part of our country, in contrast to the study done in Tanzania [13] where advanced stage and larger size at presentation was more common. This can be attributed to the fact that awareness of breast cancer in the central part of our country was high (Table 1).

Also the 80% of the patients had mass as the first symptom, in contrast to the study done in India [11] where 60% of women had a lump as a first symptom respectively, whereas in Tanzania [13] first sign were ulceration and peau d' orange appearance mostly. Other symptoms were pain, ulceration, bleeding, discharge and signs of distant metastasis, but those signs were very less when compared to self detectable mass. Again, while considering >5 cm size as a large tumor; Only 10.92% of tumor were large when first presented to the hospital, in contrast to the study done in Tanzania [13] where a higher percentage of the patients presented with a large tumor size (Table 1).

### Stage

Staging of breast cancer [9] is a part of the pre-treatment evaluation to assess the extent of the disease and treatment. The trend is improving to present early, 41.31% of our breast cancer patients present in late stage (considering late stage as stage higher than IIB, i.e III & IV). Stage II (49.10%), Stage III (40.77

%) were the most common stages at diagnosis, in contrast to Tanzania where higher percentage of the patients were diagnosed with late stage cancer [11] (Table 2).

### Receptor status

In our study, Out of 183 breast cancer patients hormonal receptor status test was done in only 124 patients, of which 69 (55.64%) patients were ER-/PR-, 41 (33.06%) patients were ER+/PR+, 8(6.45%) patients were ER+/PR- and 6(4.83%) patients were ER-/PR+ which was comparable to a study done in Nepal [12] (Table 3).

There was a statistically significant association between ER-/PR- status and younger age women (<50years) (using chi-square test, p-value<0.05) comparable to a study done in India [14] and Saudi Arabia [15] (Table 3).

Among 73 patients tested for Her-2/Neu included in our study, 29 (39.72%) patients were found to have positive Her-2/neu status, which was way higher than the study of molecular biology international [16] where only 15-30% her-2/Neu + receptor expressed in breast cancer. Out of 29 positive Her-2/neu status 19 patients belonged to younger age groups (<50years). And, the Her-2/Neu expression had statistically significant association with a younger age group (<50years) (using chi-square test; p-value<0.05) (Table 4).

We found 24 (32.87%) of the patients as triple negative among the test ones, in contrast to the study done in Nepal [12] where 41.3% were triple negative. As per the popular belief, triple negative cancer is more aggressive cancer, [17] association of triple negative cancer in younger women couldn't be derived because of insufficient data. Also, no significant association between progesterone negative (PR-) and Her-2/neu + status breast cancer was elicited.

Higher tumor stage(>IIB) was found to have a statistically significant association with a younger age group (<50years) (using chi-square test; p-value<0.05) (Table 5).

Higher tumor size(>5cm) was also found to have a statically

**Table 1:** distribution of breast cancer, according to tumor size and on the basis of 'large tumor' and 'not large tumor'.

	Size (cm)	Percentage (%)	Percentage (%)
Not large tumor(<5cm)	<2cm	6.01%(11)	89.07%(163)
	2-5cm	83.06%(152)	
Large tumor(>5cm)	>5 cm	10.92%(20)	10.93%(20)
Total		100%(183)	100%(183)

**Table 2:** Distribution of breast cancer, according to stage.

Stage	Percentage/Total number
CIS	0.54%(1)
Stage I	8.74%(16)
Stage IIA	33.80%(62)
Stage IIb	15.30%(28)
Stage IIIa	35.31%(65)
Stage IIIb	1.09%(2)
Stage III C	4.37%(8)
Stage IV	0.54%(1)

**Table 3:** ER/PR status according to age and a calculation of association of ER-/PR- status with age group.

ER/PR status		<50years	>50years	Total(other than ER-/PR-)	Total
ER-/PR-		48(38.71%)	21(16.94%)		69(55.64%)
Other than ER-/PR-	ER+/PR+	18	23	41(33.06%)	55(44.35%)
	ER+/PR-	4	4	8(6.45%),	
	ER-/PR+	2	4	6(4.83%)	
	Total (other than ER-/PR-)	24(19.35%)	31(25%)		
Total		72	52		124(100%)

**Abbreviations:** ER+: ER: Estrogen Receptor (positive); PR+: Progesterone Receptor (positive); ER- : Estrogen Receptor (negative); PR- : Progesterone Receptor (negative).

**Table 4:** Her 2/neu status according to age group.

Her-2/Neu	Age <50years	Age >50years	Total
Positive	19(26.03%)	10(13.70%)	29(39.73%)
Negative	19(26.03%)	25(34.25%)	44(60.27%)
Total	38	35	73

**Abbreviation:** Her-2/Neu: Human Epidermal Growth Factor Receptor

**Table 5:** Calculation of association of tumor stage greater than IIB with age group.

Stage	Higher than stage IIB	Up to stage IIB	Total
Age <50years	53(28.96%)	45(24.59%)	98
Age >50 years	23(12.57%)	62(33.88%)	85
Total	76	107	183

**Table 6:** Calculation of association of tumor size('large tumor' and 'not large tumor') with age group.

Size	>5 cm	<5 cm	Total
Age <50years	15(8.19%)	83(45.35%)	98
Age >50years	5(2.73%)	80(43.71%)	85
Total	20	163	183

significant association with younger age group(<50years)(using chi-square test; p-value <0.05) (Table 6).

## CONCLUSION

Our study demonstrated that most of the patient presented with locally advanced disease, i.e., Stage II and Stage III. Considering the receptor status, ER-/PR-cases were most prevalent as reported by studies in other South Asian population, which are inversely related to the prevalence reported in Western populations. [15,18-20]. Based on our study findings, we recommend that:

1. Because of the high incidence (39.72%) of Her-2/neu + tumor, every case regardless of ER/PR status or size, stage, age, risk factors, aggressiveness etc should undergo Her-2/neu testing.
2. We found a correlation of younger patients with Her-2/Neu and aggressiveness.

Aggressive cancer mostly in younger age could be treated with hormone receptor antibody in case if there is ER/PR negative and Her-2/Neu positive type cancer.

3. Triple negative status, prevalence was lower in contrast to the previous studies done in Nepal. So, the appropriate screening method should be employed for the breast cancer in all age groups for earlier detection and possible implementation of hormonal receptor antibody treatment.

Furthermore, studies to be done to understand correlation between ER/PR/Her-2 receptor status and younger age with aggressiveness of disease for improvement of hormonal treatment option.

## REFERENCES

1. American cancer society. Breast cancer facts and figures 2013-2014. Atlanta: American cancer society, inc. 2013.
2. Binu V, Chandrashekhar T, Subba S, Jacob S, Kakria A, Gangadharan P, et al. Cancer pattern in western Nepal: A hospital based retrospective study. Asian Pac J Cancer Prev. 2007; 8: 183-186.
3. Singh YP, Sayami P, Management of Breast Cancer in Nepal. JNMA. 2009; 48: 252-257.
4. Breast Cancer Estimated Incidence, Mortality and Prevalence Worldwide in 2012.

5. WHO World Health Statistics. World Health Organization, Geneva. 2012; 35:73.
6. World Health Organization: Cancer. (Online) 2009.
7. World health rankings live longer live better.
8. Pradhananga KK, Baral M, Shrestha BM. Multi-institution hospital-based cancer incidence data for Nepal: An initial report. *Asian Pac J Cancer Prev.* 2009; 10: 259-262.
9. American joint committee on cancer, breast cancer staging 6<sup>th</sup> edition.
10. *Journal of Chitwan Medical College.* 2013; 3: 22-25.
11. Suresh P, Batra U, Doval DC. Epidemiological and clinical profile of triple negative breast cancer at a cancer hospital in North India. *Indian J Med Paediatr Oncol.* 2013; 34: 89-95.
12. Acharya SC, Jha AK, Manandhar T. Clinical Profile of Patients Presenting with Breast Cancer in Nepal. *Kathmandu Univ Med J.* 2012; 39: 3-7.
13. Burson AM, Soliman AS, Ngoma TA, Mwaiselage J, Ogweyo P, Eissa MS, et al. Clinical and epidemiologic profile of breast cancer in Tanzania. *Breast Dis.* 2010; 31: 33-41.
14. Dutta V, Chopra GS, Sahai K, Nema SK. Hormone receptors, Her-2/Neu and chromosomal aberrations in breast cancer. *Medical Journal Armed Force India.* 2008; 64: 11-16.
15. Arafah M. Correlation of Hormone Receptors with Her-2 Neu Protein Expression and the Histological Grade in Invasive Breast Cancers in a Cohort of Saudi Arabia. *Turk Patoloji Derg.* 2012; 28: 38-43.
16. Nida Iqbal, Naveed Iqbal. Human Epidermal Growth Factor Receptor 2 (HER2) in Cancers: Over expression and Therapeutic Implications. *Molecular Biology International.* 2014; 2014: 9.
17. Boyle P. Triple-negative breast cancer in focus: From biology to novel therapeutics Triple-negative breast cancer: epidemiological considerations and recommendations. *Ann Oncol.* 2012; 23: 7-12.
18. Correlation between hormone receptor status and age, and its prognostic implications in breast cancer patients in Bahrain. *Saudi Med J.* 2016; 37: 37-42.
19. Ratnatunga N, Liyanapathirana LV. Hormone receptor expression and Her/2neu amplification in breast carcinoma in a cohort of Sri Lankans. *Ceylon Med J.* 2007; 52: 133-136.
20. Jahanzeb M. Adjuvant trastuzumab therapy for HER2-positive breast cancer. *Clin Breast Cancer.* 2008; 8: 324-333.

**Cite this article**

Shrestha JS, Shrestha A, Shrestha S, Shrestha S, Sharma TR, et al. (2016) Epidemiology and Clinical Profile of Breast Cancer in Central Nepal. *Ann Breast Cancer Res* 1(1): 1005.