

## Patterns of Cancer in University of Gondar Hospital: North-West Ethiopia

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### Abstract

#### Background

Cancer affects all human beings. However, the type and patterns of occurrence vary depending on geographical location, socio-economic status, life style, genetic variation and other risk factors. Like other sub-Saharan countries, the incidence of cancer is rising in Ethiopia. The number of patients with a diagnosis of cancer is alarmingly rising in University of Gondar Hospital. Here, we describe the pattern of cancer diagnosed with their socio demography.

#### Methodology

**Study design:** This was a retrospective record analysis of pathology service results, biopsy and FNAC.

**Population:** All patients with a record of diagnosis as cancer according to the pathology (FNAC and biopsy) from Sept 2014 to Aug 2015 were included

**Data collection and handling:** Data was collected from the pathology department record books by physicians working in the department. It was documented in an excel sheet and cross checked for consistency by the investigator. It was transferred to SPSS version 20 and descriptive analysis was done.

#### Result

Out of 3231 samples (1263 biopsies and 1968 FNAC) evaluated in university of Gondar hospital in 2014 – 2015, 540 (16.7%) were malignant cancer cases. Among this 346 (64%) were females and the rest 194 (36%) were males. The age pattern shows, 499 (92%) were occur in adults and 41 (8%) are occurred in children. Lymphomas, cervical cancer and breast cancer are the three top common cancers of all age groups.

In adult population cervical cancer, breast cancer and lymphoma are most common. In children of age less than 14 years lymphomas, wilm's tumor and retinoblastoma were the three top cancers. Cervical cancer, breast cancer and lymphomas are found to be the commonest cancers in females. On the other hand, lymphomas, head and neck squamous cell carcinomas (HNSCC), and colorectal cancer are the three top commonest cancers in males.

#### Conclusion

This first study on cancer pattern in North-west Ethiopia indicates cancer is one of the common finding from cytology and histology samples analyzed in the pathology department. Comprehensive demographic and clinical data using population or facility based registry is required to get better information and for planning and monitoring cancer pattern in the region. Additionally, it will help in resource prioritization and decision making in the treatment strategies of cancer in the country.

### Key words:

Patterns of cancer; Gondar; North West Ethiopia

### Introduction

Cancer affects all human beings. However, being the most complex and diverse disease; the type and patterns of occurrence vary

depending on geographical location, socio-economic status, life style, genetic variation and other risk factors.

In 2012, there were an estimated 14.1 million new cancer cases diagnosed worldwide (excluding non-melanoma skin cancers) and 8.2 million estimated deaths occurred [1]. The most common cancers in men were cancers of the lung (16.7%), prostate (15.0%) and colorectal (10.0%). Among the women cancers of the breast (25.2%), colorectal

(9.2%) and lung (8.7%) were the top commonest cancers. Although the highest incidence and prevalence is recorded in high-income countries, the age-standardized mortality rate is higher in low-income countries like Africa [2].

In Africa cancer is emerging as the critical public health problems. In 2008, there was an estimate of 715,000 new cancer cases and 542,000 cancer deaths occurred in Africa [3]. In sub-Saharan African countries cancers of prostate (20.3%), liver (9.7%) and Kaposi – sarcoma (9.2%) the three commonest cancers in males, while cancers of the breast (25.2%), cervix (25.2%) and colorectal (3.7%) are the top in women.

Like other sub-Saharan countries, the incidence of cancer is rising in Ethiopia, too. Currently, Ethiopia has only one cancer treatment center in Black Lion hospital in Addis Ababa and only one population based cancer registry in Addis Ababa city. Therefore, the estimate of cancer burden in the country is made on basis of extrapolations of data from these two sources.

According to the data from Black Lion Hospital, radiotherapy center, where two third of patients seen are coming from different regions of the country the commonest cancer in males are Head and Neck tumors, sarcomas and GI malignancy. In women, cancers of the cervix, breast and colorectal are top three cancers [4].

On the other hand, Addis Ababa population based cancer registry report shows cancers of colorectal (19%), leukemia (18%) and prostate (11%) are commonest in males. In females, cancers of the breast (31%), cervix (16%) and ovary (6%) are the commonest [5]. Ethiopia with estimated population of over 90 million people has diverse geographical, cultural and genetic make-up. Hence, data from Black Lion hospital or Addis Ababa cancer registry may not truly show the exact pattern of cancer in different parts of the country.

University of Gondar Hospital is one of the biggest referral Hospitals in North-west Ethiopia. It is serving as a referral center for four district hospitals and over five million people. The number of patients with diagnosis of different types of cancers is increasing in this Hospital. But, there is no published data showing the pattern of cancer from this hospital or the region to date. Thus, this study was designed to get information on the pattern of cancer in the North-west part Ethiopia. This is important for planning in the management of resources and further research.

## Methodology

### Setting:

University of Gondar Hospital is found in northwest Ethiopia, 750 km from the capital. It served a total population of around 5 million. It has clinical services in different departments such as internal medicine, surgery, gynecology and obstetrics, pediatrics. There is also a pathology department with fine needle aspiration cytology and biopsy services.

The available staining methods are giemsa, hematoxyline-eosin. Specialized methods like immunohistochemistry staining are lacking. Patient suspected of cancer are commonly seen at the outpatients departments of surgery and internal medicine.

Recently, a dedicated cancer wing with its own out patients department and ward service has started to give service. A tumor

board is established to help integrated management of patients with cancer.

### Study design & population

This was a retrospective record analysis of pathology service results. All patients with a record of diagnosis as cancer according to the pathology (FNAC and biopsy) from Sept 2014 to Aug 2015 were included.

### Data collection and handling

Data was collected from the pathology department record books by physicians working in the department. It was documented in an excel sheet and cross checked for consistency by the investigator. It was transferred to SPSS version 20 and descriptive analysis was done.

Data collection process was finalized on December, 2015. All patients included were those whose cancer diagnosis was made after establishment of new cancer treatment center in University of Gondar Hospital.

### Results

From September, 2014 to August, 2015 a total of 3231 specimens (1263 biopsies and 1968 FNAC) were evaluated in department of pathology, University of Gondar Hospital. Of these 540 (16.7%) were found to be cancers.

The median age of patients at diagnosis was 46 years, with range of 1-86 years. Of 540 malignant tumors, 346 (64%) were females and 194 (36%) were males, with M:F ratio of 1:1.8. When we see the age distribution 499 (92%) occurred in adults age greater than 14 years and 41 (7.6%) occurred in children (Table 1).

SOCIODEMOGRAPHY		FREQUENCY N (%)
Gender	Male	194 (36%)
	Female	346 (64%)
Age (years)	0-14	41 (7.6%)
	15-24	39 (7.2%)
	25-54	295 (54.6%)
	55-64	79 (14.6%)
	≥65	86 (16%)

**Table 1:** Age and sex distribution of cancer patients seen at pathology Department, University of Gondar hospital, 2014-15.

Lymphomas accounts for 17.2% of the total cancer cases. Out this 80% of them are Non-Hodgkin's Lymphomas (NHL) and the rest 20% are Hodgkin's lymphoma (HL). From total lymphoma cases 27% is diagnosed in children of age less than 14 years old.

Cancer of uterine cervix accounts for 15.2% of all cancer cases, which made it the second most common of all cancers. But cervical cancer is the first top cancer in adults above age of 14 years old. The median age of occurrence is 50 years, with range of 30-83 years. Breast cancer is the third commonest cancer according to this study. It comprises 14.1% of all cases. Out of this 14.5% (11 cases) are male

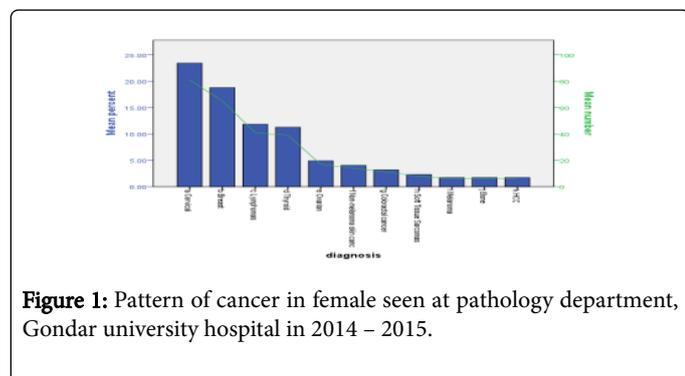
breast cancers. Most of the patients are young, with median age of 40 years, ranging from 20-83 years (Table 2).

CANCER TYPE	FREQUENCY N (%)
Lymphoma	93 (17.2%)
Cervical cancer	82 (15.2%)
Breast cancer	76 (14.1%)
Thyroid cancer	47 (8.7%)
Head and neck squamous cell carcinoma	34 (6.3%)
Skin cancers	33 (6.1%)
Colorectal cancer	26 (4.8%)
Ovarian cancer	17 (3.1%)
Hepatocellular cancer	12 (2.2%)
Salivary gland tumors	12 (2.2%)

**Table 2:** Top 10 cancer types seen at pathology department, University of Gondar Hospital of all age groups, 2014-2015.

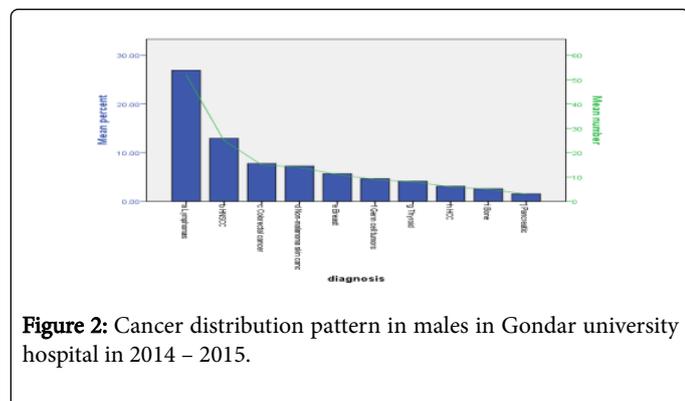
### The distribution of cancer by gender

The five commonest cancers in females are cervical cancer, breast cancer, lymphomas, thyroid cancer and ovarian cancers. The frequency distribution of female cancer is shown (Figure 1).



**Figure 1:** Pattern of cancer in female seen at pathology department, Gondar university hospital in 2014 – 2015.

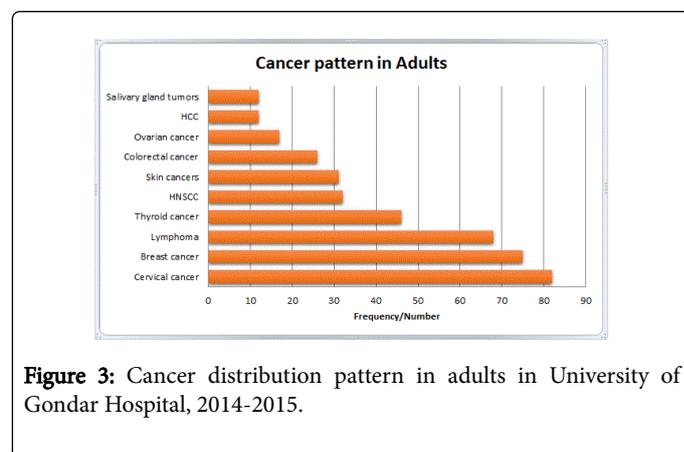
In males, lymphomas, head and neck squamous cell carcinomas (HNSCC), colorectal cancer, no-melanoma skin cancers and breast cancer are the five commonest cancers (Figure 2).



**Figure 2:** Cancer distribution pattern in males in Gondar university hospital in 2014 – 2015.

### Cancer distribution pattern in adults

In adults of age greater than 14 years; cervical cancer, which accounts for 82 (16.4%), is the leading malignancy. Breast cancer 75 (15%), lymphoma 68 (13.6%), thyroid cancer 46 (9.2%) and head and neck squamous cell carcinoma 32 (6.4%) were the top malignancies following cervical cancer (Figure 3).



**Figure 3:** Cancer distribution pattern in adults in University of Gondar Hospital, 2014-2015.

### Cancer distribution pattern in children

CANCER TYPE	FREQUENCY N (%)
Lymphoma	25 (61%)
Wilm's tumor	4 (10%)
Retinoblastoma	3 (7%)
Others	9 (22%)

**Table 3:** Childhood cancer distribution in University of Gondar Hospital, 2014-2015.

The three commonest childhood malignancies found in this study were Lymphomas, wilm's tumor and retinoblastoma (Table 3).

All these 3 malignancies comprise about 78% of childhood cancers. In this study, age cut point of 14 years inclusive was considered as child.

## Discussion

Cancer management is one of the health needs which do not receive adequate attention in Africa, including Ethiopia. This is largely because of much attention is diverted to communicable diseases such as HIV/AIDS, Tuberculosis and malaria. However, the mortality due to cancer is greater than the mortality due the above mentioned communicable diseases together [1].

In Ethiopia cancer is also increasing and becoming the major public health problems. It is estimated that about 60,000 new cancer cases diagnosed each year in the country. Due to lack of cancer treatment center outside the capital city, Addis Ababa; all patients with cancer forced to go to Black Lion Hospital. Among the patients got the chance of treatment in this hospital only 10% them are found to have early stage cancer, the rest have advanced, metastatic or unknown stage [4].

The findings of the study indicate cancer is one of the major emerging health problems in University of Gondar Hospital. One-sixth of the samples subjected for histopathological examinations were cancer. The commonest cancer type in the Hospital were cancer in the women, cervical cancer & breast cancer; cervical cancer ranked the first. This finding is similar to facility based study from TASH Radiotherapy center, where two third of patients come out of Addis Ababa [4]. But, it contrast with report from Addis Ababa cancer registry, in which breast cancer is the leading cancer twice that of cervical cancer [2,5]. It also contrast with estimates from neighboring countries such as Sudan, Kenya, Djibouti, Eretria and Somalia, where breast cancer stands number one followed by cervical cancer. The high incidence of cervical cancer in this area could be due to patient characteristics where most of patients are coming from rural area and the absence of well-functioning cervical cancer screening program. The other possible main reason for this difference is that unlike facility based registry where both urban and rural patients are represented, data from population cancer registry collect data from the capital city Addis Ababa with different life style resulting in selection of urban population.

The other finding of this study is the increase in proportion of males with breast cancer. Out of total of 76 breast cancer cases, 11 (14.5%) were male breast cancers. This is similar to the report from Addis Ababa cancer registry in which male breast cancer is one the top 10 cancers in males, about 7% [5]. Male breast cancer makes up less than 1% of all cancers in men and less than 1% of all breast cancers in the United States [6]. But, different reports show the incidence is higher in Africa, about 4.2% of all breast cancers [7].

In male the leading type noted in this study is Lymphoma, mainly due to large proportions of patients were young and pediatric age group and 70% were less than age of 54 year. A trend of increase in incidence of Lymphoma was reported from 1995 onwards in sixteen year retrospective study conducted at Jimma University Hospital [8]. However, this finding is different from TASH radiotherapy center, where lymphoma is seen in 9% of men, ranking it the 5 commonest cancers in men and 1% of cancer in women [5]. The reason for this

high incidence lymphoma in University of Gondar hospital is probably related to younger age, and chronic infections like HIV, EBV, HBV and HCV. The other plausible explanation is the accessibility of tissue for FNAC and biopsy which could result in selection of patients with accessible site to be referred to pathology department.

Finally, patterns of cancer in University of Gondar hospital found by this study is different from worldwide cancer pattern reported by WHO. According to WHO cancer report 2014, common cancers in men were cancers of the lung, prostate and colorectal and among the women cancers of the breast, colorectal and lung [1,2]. The main difference is the low incidence of prostate and lung cancers in Gondar area; which could be explained by age and lower smoking prevalence in the area, respectively. The most important risk factor for prostate cancer is older age. The median age at diagnosis is 66 years [1]. This could be the reason for low incidence of prostate in this study, in which only 16% of patients were above 65 years. On the other hand, smoking is the most important risk factor for development of lung cancer [1,2]. The smoking prevalence in Ethiopia is very low, which is estimated to be less than 5% [9]. This could be a reason for lower report of lung cancer in this study. In addition to above mentioned rationales, unavailability of service like neurosurgery, pulmonology or image guided biopsy procedures, could result in lower incidence of some tumors like brain, prostate and tumor located in deep seated organs.

## Conclusion

This first study on cancer pattern in North-west Ethiopia indicates cancer is one of the common finding from cytology and histology samples analyzed in the pathology department. Comprehensive demographic and clinical data using population or facility based registry is required to get better information and for planning and monitoring cancer pattern in the region. Additionally, it will help in resource prioritization and decision making in the treatment strategies of cancer in the country.

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