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Baseline Study of Cancer Patterns in the Department of Pathology of the Tamale Teaching Hospital, Northern Region of Ghana

E. M. Der[1*], M. M. Ibrahim[1], A. D. B. Buunaaim[2], S. Naporo[3], N. Y. Tolgou[2], E. Yenli[2], S. Gumanga[4], T. Adjeso[5], M. Damah[5] and S. Tabiri[2]

[1]Department of Pathology, School of Medicine and Health Science, University for Development Studies, Tamale Teaching Hospital, Tamale, Ghana.
[2]Department of surgery, School of Medicine and Health Science, University for Development Studies, Tamale Teaching Hospital, Tamale, Ghana.
[3]Department of Pathology, Korle-Bu Teaching Hospital, Accra, Ghana.
[4]Department of Obst and Gynae, Tamale Teaching Hospital, Tamale, Ghana.
[5]Department of ENT, School of Medicine and Health Science, University for Development Studies, Tamale Teaching Hospital, Tamale, Ghana.

Authors' contribution

Authors EMD conceptualized the study. Authors EMD, MMI, ADBB, SN, NYT, EY SG, TA, MD and ST compiled and entered and analysed the data. Author EMD drafted the manuscript. Authors EMD, MMI, ABAB, SN, NYT, EY SG, TA, MD and ST read, edited and approved the final manuscript.

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ABSTRACT

Background: Documentation of baseline data in any newly established academic or health institution is a pre-requisite for future research. The histopathological review aimed to describe the patterns and the relative proportions of the various cancers diagnosed in the Department of Pathology, Tamale Teaching Hospital (TTH) to be used as a baseline data for future research.

**Corresponding author: E-mail: maadelle@yahoo.com;*

Materials and Methods: This retrospective review was conducted from 1st June 2011 to 30th June 2016 in the Department. Data were analysed using SPSS software version 23.0 (Chicago). Fisher's exact test was used to compare common cancers.

Results: A total of 715 cancer cases were reviewed, majority were females 534 [(76.7%), (p< 0.0001)], with female to male ratio of 3:1. The mean age of males was 49.9±21.6 years compared to 48.7±17.5 years for females. Common male cancers were: gastric (17.7%), soft tissue (12.2%), larynx (9.9%), bone (8.8%) and prostate (8.3%); while for the females were: breast (33.5%), cervix (31.1%), ovary (7.3%), gastric (3.9%) and uterus (3.7%). Male genital tract cancers were: prostate (65.2%), penis (26.1%), testis (4.3%) and scrotum (4.3%). Cancers of the female reproductive system were: cervix (70.3%), ovary (16.5%), uterus (8.5%), vagina (2.6%), vulva (1.7%) and fallopian tube (0.4%). A total of 454 (63.5%) cancers occurred in both males and females. Among all the cases, 65.6% were occurred in females (p< 0.0001), particularly in breast [(96.3%), p< 0.0001], the urinary system [(56.0%), p= 0.5721] and conjunctiva/orbital [(62.5%), p= 0.6193].

Conclusion: Cancers were found to be the common among relatively young females. Breast, urinary system and conjunctiva and orbital malignancies were significantly common in females.

Keywords: Male and female cancers; baseline study; Tamale; Ghana; future research.

1. INTRODUCTION

The non-communicable disease is currently a major cause of morbidity and mortality among Ghanaians, hence a public health issue [1-4]. The situation is particularly worse with the cancers [5-7]. Previous studies conducted in Southern Ghana reported that most Ghanaians present late to health facilities with cancers and hence experienced poor treatment outcomes [8,9]. For instance, some previous studies on female breast cancer found that the disease to be common in relatively young females who normally present to health facilities with an advanced stage of the disease [8,9]. Studies have also found that cancers are more frequently diagnosed in Ghanaians women in compared to their male counterparts [10-19]. The most common male cancers reported in 2014 were liver (21.1%), prostate (13.2%), lung (5.3%) and stomach (5.3%), while breast (33.9%), cervix (29.4%), ovary (11.3%) and endometrium (4.5%) were the most common female cancers [16,17].

From 1956 to 2017, published reports on cancer have been concentrated within the Middle belt and the Southern part of Ghana. This calls for the need to have data on cancers within the Northern parts of the country. The Tamale Teaching Hospital Pathology Department located in the regional capital of the Northern Region receives specimens from the three regions of Northern Ghana. Documentation of baseline data in any newly established academic health institution is a pre-requisite for future research. The histopathological review aimed to describe the patterns and relative proportions of the various cancers diagnosed in the Department of Pathology of the Tamale Teaching Hospital which can be used as a baseline data for future research.

2. MATERIALS AND METHODS

2.1 Study Design

A retrospective review was conducted from 1st June 2011 to 31st June 2016.

2.2 Study Site

The study was performed in the Department of Pathology, Tamale Teaching Hospital (TTH). This Department receives cases from TTH and other hospitals, within the three Northern Regions and beyond.

2.3 Data Collection and Analysis

All the histology request forms, the histology reports and the corresponding histology slides of all malignancies diagnosed in our institution from 1st June 2011 to 31st June 2016 were reviewed. Data were collected on the demographic features and the histopathological characteristics of all cancers diagnosed during the period of review. Data were entered into a statistical database and analysed using SPSS software version 23.0 (Chicago). The results were presented in bar charts and frequency tables. Fisher's exact test was used to compare the common male and female cancers.

Inclusion criteria: All histologically confirmed malignancies diagnosed during the period of study.

Exclusion criteria: All cases of poorly fixed specimens and those with incomplete records were excluded.

3. RESULTS

3.1 Sociodemographic Characteristics of the Study Population

From 1st June 2011 to 31st June 2016, a total of 715 malignancies were confirmed histologically in our institution, of which 534 were females [(76.7%), ($p< 0.0001$)], with female–male ratio of approximately 3:1.

3.2 Male Cancers by Sites

The ages of 181 males diagnosed with cancers ranged from 2 to 89 years with a mean age of 49.9±21.6 years, and the modal age group was 50 – 59 years (35 patients; 20.0%) (Fig. 1).

The common male cancers were: Gastric 32 (17.7%), soft tissue 20 (12.2%), larynx 18 (9.9%), bone 16 (8.8%) and the prostate 15 (8.3%), (Table 1).

3.3 Clinico-pathological Features of Male Cancers

3.3.1 Gastric cancers

The mean age of males with gastric cancers was 59.2±17.1 years. The most common clinical presentation was gastric outlet obstruction 12 (47.5%) with adenocarcinoma as the most prevalent histological subtype 30 (93.8%). Among the 18 cases that had grading, majority (10 cases; 55.6%) were poorly differentiated (Table 2).

3.3.2 Soft tissue

There were 20 soft tissue malignancies (11.0%) with an age range of 5 – 73 years and a mean age of 34.7±20.4 years. Majority (18 cases; 90.0%) were sarcomas (Table 2).

3.3.3 Laryngeal cancer

The mean age of males with laryngeal cancers was 55.9±15.3 years. Hoarseness of voice was the most prevalent clinical presentation (10 cases; 62.5%), with invasive SCC squamous as the commonest histological subtype (88.9%). Approximately 44.4% were well-differentiated cancers (Table 2).

3.3.4 Prostate cancers

Cancer of the prostate was commonly diagnosed in the elderly with a mean age of 71.7±11.8. The commonest sign was a hard nodular gland on digital rectal examination. All the cancers were invasive adenocarcinomas (Table 2).

3.3.5 Bone cancers

Malignancies of bone origin were commonly diagnosed in patients within the age of 4 to 82 years, with a mean age of 37.3±25.6. The most prevalent malignancy was osteosarcoma (62.5%) (Table 2).

3.3.6 Colorectal cancers

Males with colorectal cancers were relatively young, with a mean age of 45.0±16.0 years. The most prevalent histological subtype was adenocarcinoma (63.6%) (Table 2).

3.3.7 Oesophageal cancers

Oesophageal cancers were commonly diagnosed in the elderly with a mean age of 55.8±10.5 years. Dysphasia was a common symptom at presentation (60.0%). Histologically, invasive squamous cell carcinoma was the commonest subtype. Majority (60.0%) of the cases were moderate to poorly differentiated (Table 2).

3.4 Genital Tract Cancers

A total of 23 male genital tract cancers were diagnosed. These were the following: prostate 15 (65.2%), penis 6 (26.1%), Testis 1 (4.3%) and scrotum 1 (4.3%).

3.5 Female Cancers (by Sites)

The ages of females diagnosed with cancer ranged from 2 to 89 years with a mean of 48.7±17.5 years and a modal age group of 40 – 49 years (131 patients;24.7%) (Fig. 1). The common female cancers occurred in: breast (33.5%), cervix (31.1%), ovary (7.3%), gastric (3.9%), uterus (3.7%), soft tissue (3.7%), and oesophagus (2.8%) (Table 3).

3.5.1 Breast cancer

The mean age of females diagnosed with breast cancer (BC) was 50.1±16.5 years, with a modal age group of 40 – 49 years (24.6% of patients). Women commonly presented with palpable breast lumps 178 (99.4%). The most prevalent histological subtype of BC was invasive ductal carcinoma (NOS) (154; 86.0%). For cases that had grading, 102 (85.7%) were high grade.

3.5.2 Cervical cancer

The mean age of patients with cervical cancer was 52.0±15.2 years, with a modal age group of 30 – 39 years (25.2% of patients). Women with cervical cancer commonly presented with bleeding per vagina (107; 78.1%). The commonest histological subtype was invasive SCC (156; 94.0%).

3.5.3 Ovarian cancers

Ovarian cancers were common in younger age groups with a mean age of 39.8±14.5 years and a modal age group of 40 – 49 years (33.3% of patients). Germ cell tumours were the most common histological subtype for 15 cases (38.5%).

3.5.4 Gastric cancers

Gastric cancers were common in 7 patients (33.3%), within the age group of 70 -79 years with epigastric pain being the most common clinical symptom. Invasive adenocarcinoma was the commonest histological subtype with 19 cases (90.4%).

3.5.5 Uterine cancers

Uterine malignancies presented as bleeding per vagina in 14 cases (70.0%), with endometroid adenocarcinoma being the most common histological subtype in 11cases (55.0%), followed by choriocarcinoma with 6 cases (30.0%).

3.5.6 Soft tissue cancers

Many of the patients with soft tissue malignancies presented with swelling in 16 cases (80.0%). Sarcomas were the most common histological type in 14 cases (70.0%).

3.5.7 Oesophageal cancers

The most common clinical presentation of oesophageal cancers was dysphagia in 11 cases (73.3%) with invasive SCC as the major histological subtype in 11cases (73.3%).

3.5.8 Genital tract cancers

A total of 236 female cancers were genital tract malignancies (44.2%). These were the following: uterine cervix 166 (70.3%), ovary 39 (16.5%), uterus 20 (8.5%), vagina 6 (2.6%), vulva 4 (1.7%) and fallopian tube 1(0.4%).

3.6 Common Male and Female Cancers by Sites

A total of 454 cancers (63.5%) occurred in both males and females. Majority of the patients [298 cases (65.6%), p< 0.0001] were in females (suffered from breast cancers [179 cases (96.3%), p <0.0001], followed by cancers of urinary tract [25 cases (5.5%), p= 0.5721] and conjunctiva/orbital cancers. All other cancers were common in males, but there were no statistically significant associations recorded (Table 5).

4. DISCUSSION

A non-communicable disease, such as cancer, is common in Ghana and Continent Africa [5,10]. Cancer is currently viewed as an emerging public health problem that needs to be dealt with appropriately to sustain public health advances that have already been achieved in developing countries [10]. This calls for baseline documentation of the disease and its progression in our health and research facilities. In this first baseline review of cancer patterns at the TTH in Northern Ghana, cancer was found to be more commonly diagnosed in women in compared to men (p< 0.0001). This is in accordance with other previous studies reported that the disease is female dominated [11,12].

The commonest male cancer in the current review was invasive gastric adenocarcinoma. *Helicobacter pylori* has been linked with peptic ulcer disease, non-autoimmune gastritis, non-peptic ulcer dyspepsia, gastric carcinoma and lymphoma [13], predominantly in environments with poor sanitation control methods [14-16]. *H. pylori* infection is more frequent and acquired at an earlier age in developing countries compared to European populations [13,16]. Thus the predominance of invasive adenocarcinoma in males in this study might be attributed to the high prevalence of *H. pylori* infection in Ghanaian males [14,15].

Table 1. Age distribution of cancers diagnosed in males (1st June 2011 to 30th June 2016)

Type of cancer	Total (n/%)	Age groups (years)								
		≤9	10- 19	20-29	30-39	40-49	50-59	60-69	70-79	≥80
Gastric	32(17.7)	0(0.0)	0(0.0)	0(0.0)	4(12.5)	5(15.6)	8(25.6)	4(12.5)	6(18.8)	5(15.6)
Soft tissue	22(12.2)	1(4.5)	3(13.6)	8(36.4)	3(13.6)	2(9.1)	2(9.1)	2(9.1)	1(4.5)	0(0.0)
Larynx	18(9.9)	0(0.0)	1(5.9)	1(5.9)	1(5.9)	2(11.8)	5(29.4)	5(29.4)	3(17.6)	0(0.0)
Prostate	15(8.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(20.0)	3(20.0)	5(33.3)	4(26.7)
Bone	16(8.8)	1(6.3)	5(31.3)	2(12.5)	1(6.3)	0(0.0)	3(18.8)	2(12.5)	1(6.3)	1(6.3)
Colorectal	11(6.1)	0(0.0)	0(0.0)	1(9.1)	4(36.6)	3(27.3)	2(18.2)	0(0.0)	0(0.0)	1(9.1)
Oesophagus	10(5.5)	0(0.0)	0(0.0)	0(0.0)	2(20.0)	2(20.0)	4(40.0)	0(0.0)	0(0.0)	2(20.0)
Skin	9(5.0)	0(0.0)	1(11.1)	1(11.1)	1(11.1)	4(44.4)	2(22.2)	0(0.0)	0(0.0)	0(0.0)
Urinary bladder	7(3.9)	0(0.0)	0(0.0)	0(0.0)	1(14.3)	3(42.8)	1(14.3)	1(12.3)	1(14.3)	0(0.0)
Breast	7(3.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(14.3)	3(42.8)	2(28.6)	1(14.3)
Lymph node	7(3.9)	1(14.3)	1(14.3)	0(0.0)	1(14.3)	3(42.8)	0(0.0)	1(14.3)	0(0.0)	0(0.0)
Nasopharynx	6(3.3)	0(0.0)	1(16.7)	1(16.7)	1(16.7)	1(16.7)	1(16.7)	0(0.0)	0(0.0)	1(16.7)
Penis	6(3.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(33.3)	2(33.3)	0(0.0)	1(16.7)	1(16.7)
Kidney	4(2.2)	0(0.0)	1(25.0)	0(0.0)	1(25.0)	2(50.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Eye/conjunctiva	3(1.7)	0(0.0)	1(33.3)	1(33.3)	0(0.0)	0(0.0)	1(33.3)	0(0.0)	0(0.0)	0(0.0)
Liver	3(1.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(100.0)
Omentum	2(1.1)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(50.0)	0(0.0)	1(50.0)	0(0.0)	0(0.0)
Testis	1(0.6)	0(0.0)	0(0.0)	1(100.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Scrotum	1(0.6)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(100.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)

Table 2. The clinicopathological characteristics of common subtypes of male cancers

Cancer and clinical feature	Frequency(n) /percentage (%)	Cancer and clinical features	Frequency (n) /Percentage (%)	Cancer and clinical features	Frequency (n)/ Percentage (%)
GASTRIC		**LARYNX**		**OESOPHAGUS**	
Symptoms/signs		***Symptoms/signs***		***Symptoms/signs***	
GOO	12(37.5)	Hoarseness of voice	14(77.8)	Epigastric pain	4(40.0)
Epigastric pain	10(31.3)	Dysphagia	4(22.2)	Dysphagia	6(60.0)
Abdominal mass	8(25.0)	***Histological subtype***		***Histological subtype***	
Dysphagia	2(6.2)	SCC	14(100.0)	SCC	5(50.0)
Histological subtype		***Histological grade***		Adenocarcinoma	5(50.0)
Adenocarcinoma	31(96.9)	Well differentiated	8(44.5)	***Histological grade***	
NHL	1(3.1)	Moderately differentiated	4(22.2)	Well differentiated	4(40.0)
Histological grade		Poor differentiated	6(33.3)	Moderately differentiated	2(20.0)
Well differentiated	6(18.7)	**PROSTATE**		Poorly differentiated	4(40.0)
Moderate differentiated	8(25.0)	***Symptoms/signs***		**SKIN**	
Poor differentiated	18(56.3)	Hard and nodular	13((86.7)	***Symptoms/signs***	
SOFT TISSUE		Acute retention of urine	2(13.3)	Ulcer	9(100.0)
Symptoms/signs		***Histological subtype***		***Histological subtype***	
Swelling/mass	13(59.1)	Adenocarcinoma	15(100.0)	SCC	7(77.8)
Histological subtype		**COLORECTAL**		Melanoma	1(11.1)
All sarcomas	22(100.0)	***Symptoms/signs***		Sarcoma	1(11.1)
BONE		Abdominal mass/pain	8(72.7)	***Histological grade***	
Symptoms/signs		Constipation	3(27.3)	Well differentiated	4(57.1)
Swelling	12(75.0)	***Histological subtype***		Poorly differentiated	3(42.9)
Bone pain	4(25.0)	Adenocarcinoma	8(72.7)	**PENIS**	
Histological subtype		Others	3(27.3)	***Histological subtype***	
Osteosarcoma	10(62.4)	Stage		Well differentiated SCC	5(83.3)
Chondrosarcoma	3(18.8)	Duke's B2	2(33.3)	Sarcoma	1(16.7)
Ewing's sarcoma	3(18.8)	Duke's C	4(66.7)		

Key: GOO: Gastric outlet obstruction, SCC; Squamous cell carcinoma

Table 3. The age distribution cancers diagnosed in females (1st June 2011 to 30th June 2016)

Type of cancer/	Total (n/%)	≤9	10- 19	20-29	30-39	40-49	50-59	60-69	70-79	≥80
Breast	179(33.5)	0	2(1.1)	12(6.7)	42(23.5)	44(24.6)	30(16.8)	15(8.4)	29(16.2)	5(2.8)
Cervix	166(31.1)	0 (0.0)	0(0.0)	9(5.4)	25(15.1)	41(24.7)	36(21.7)	25 (15.1)	25(15.1)	5(3.0)
Ovary	39(7.3)	0(0.0)	4(10.3)	7(17.9)	7(17.9)	13(33.3)	6(15.4)	2(5.1)	0(0.0)	0(0.0)
Gastric	21(3.9)	0(0.0)	0(0.0)	0(0.0)	3(14.3)	6(28.6)	3(14.3)	2(9.5)	7(33.3)	0(0.0)
Uterus	20(3.7)	1(5.3)	0(0.0)	1(5.3)	4(21.1)	4(21.1)	4(21.1)	3(15.8)	1(5.3)	1(5.3)
Soft tissue	20(3.7)	1(5.3)	3(15.8)	2(10.5)	2(10.5)	5(25.0)	2(10.5)	2(10.5)	2(10.5)	0(0.0)
Oesophagus	15(2.8)	0(0.0)	0(0.0)	4(26.7)	1(6.7)	2(13.3)	4(26.7	1(6.7)	3(20.0)	0(0.0)
Nasopharynx	9(1.7)	1(11.1)	0(0.0)	1(11.1	5(55.6)	2(22.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Urinary bladder	8(1.5)	0(0.0)	0(0.0)	1(12.5)	0(0.0)	2(25.0)	1(12.5)	3(37.5)	1(12.5)	0(0.0)
Skin	8(1.5)	0(0.0)	2(25.0)	1(12.5)	0(0.0)	0(0.0)	1(12.5)	2(25.0)	2(25.0)	0(0.0)
LN	7(1.3)	0(0.0)	0(0.0)	2(28.6)	1(14.3)	2(28.6)	2(28.6)	0(0.0)	0(0.0)	0(0.0)
Bone	6(1.1)	1(16.6)	1(16.6)	1(16.6)	1(16.6)	1(16.6)	1(16.6)	0(0.0)	0(0.0)	0(0.0)
Colorectal	4(0.7)	0(0.0)	0(0.0)	1(25.0)	0(0.0)	2(50.0)	0(0.0)	0(0.0)	1(25.0)	0(0.0)
Kidney	6(1.1)	1(16.6)	0(0.0)	1(16.6)	0(0.0)	0(0.0)	1(16.6)	1(16.6)	2(33.3)	0(0.0)
Larynx	7(1.3)	1(14.3)	0(0.0)	0(0.0)	1(14.3)	2(28.6)	0(0.0)	3(42.9)	0(0.0)	0(0.0)
Eye/conjunctiva	5(0.9)	2(40.0)	0(0.0)	0(0.0)	0(0.0)	1(20.0)	1(20.0)	0(0.0)	1(20.0)	0(0.0)
Vagina	6(1.1)	0(0.0)	0(0.0)	1(25.0)	1(25.0)	1(25.0)	0(0.0)	1(25.0)	0(0.0)	0(0.0)
Vulva	4(0.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(66.7)	0(0.0)	0(0.0)	0(0.0)	1(33.3)
Omentum	2(0.4)	0(0.0)	0(0.0)	1(50.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(50.0)	0(0.0)
Fallopian tube	1(0.2)	0(0.0)	1(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Brain	1(0.2)	0(0.0)	1(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Liver	1(0.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(100)	0(0.0)	0(0.0)	0(0.0)	0(0.0)

Table 4. The clinico-pathological characteristics of common subtypes of female cancers

Cancer and clinical feature	Frequency(n)/ Percentage (%)	Cancer and clinical feature	Frequency(n)/ Percentage (%)	Cancer and clinical feature	Frequency(n)/ Percentage (%)
BREAST		**CERVIX**		**GASTRIC**	
Symptoms/signs		***Symptoms/signs***		Epigastric pain	10(47.6)
Lump	178(99.4)	Bleeding per vagina	136(81.9)	GOO	5(23.6)
Nipple discharge	1(0.6)	Others	30(18.1)	Dysphagia	2(9.5)
Histological subtype		***Histological subtype***		***Histological subtype***	
NOS	154(86.0)	SCC	157(94.6)	Adenocarcinoma	19(90.4)
Mucinous	7(3.9)	Adenocarcinoma	9(5.4)	Others	2(9.6)
DCIS	3(1.7)	***Histological grade***		***Histological grade***	
Medullary carcinoma	3(1.7)	Well differentiated	79(47.6)	Well differentiated	4(21.1)
Lobular carcinoma	2(1.1)	Moderately differentiated	42(25.3)	Moderately differentiated	6(31.5)
Others	10(8.8)	Poorly differentiated	45(27.1)	Poorly differentiated	9(47.4)
Histological grade		**OVARY**		**UTERUS**	
I	17(14.3)	***Symptoms/signs***		***Symptoms/signs***	
II-III	102(85.7)	Abdominal enlargement	39(100.0)	Bleeding per vaginam	14(70.0)
TNM Stage		***Histological subtype***		Abdominal mass	6(30.0)
I-II	26(39.4)	Granulosa cell tumour	15(38.5)	***Histological subtype***	
III-IV	40(60.6)	Pap serous cystadenocarcinoma	10(25.6)	Endometroid	11(55.0)
URINARY TRACT		Endometroid carcinoma	5(12.9)	Choriocarcinoma	6(30.0)
Symptoms/signs		Germ cell tumour	4910.3)	Leiomyosarcoma	2(20)
Haematuria	8(100.0)	Mucinous cystadenocarcinoma	4910.3)	Papillary serous adenocarcinoma	1(5.0)
Histological subtype		Sarcoma	1(2.6)	**OESOPHAGUS**	
High grade TCC	5(62.5)	**SOFT TISSUE**		***Symptoms/signs***	
SCC	3(37.5)	***Symptoms/signs***		Dysphagia	11(73.3)
SKIN		Swelling	16(80.0)	Epigastric pain	4((26.7)
Symptoms/signs		Pain	4(20.0)	***Histological subtype***	
Ulcers	8(100)	***Histological subtype***		SCC	11(73.3)

Cancer and clinical feature	Frequency(n)/ Percentage (%)	Cancer and clinical feature	Frequency(n)/ Percentage (%)	Cancer and clinical feature	Frequency(n)/ Percentage (%)
BREAST		**CERVIX**		**GASTRIC**	
Histological subtype		Sarcoma	16(80.0)	Adenocarcinoma	4(26.7)
SCC	(100.0)	Melanoma	4(20.0)	***Histological grade***	
BONE		**VAGINA**		Well differentiated	6(40.0)
Symptoms/signs		***Symptoms/signs***		Moderately differentiated	5(33.3)
Swelling	6(100.0)	Offensive Discharge	4(100.0)	Poorly	4(26.7)
Histological subtype		***Histological subtype***		**VULVA**	
Osteosarcoma	5(83.3)	SCC	2(50.0)	***Histological subtype***	
Chondrosarcoma	1(16.7)	Choriocarcinoma	2(50.0)	SCC	3(100.0)

Table 5. Comparing the relative proportions of common male and female cancers using Fisher's exact test

Type of cancer	Male (n/%)	Female (n/%)	Total (n/%)	p-value
Breast	7(3.7)	179(96.3)	186(100.0)	<0.0001
GIT	53(57.0)	40(43.0)	93(100.0)	0.0782
Head and neck	24(40.0)	16(60.0)	40(100.0)	0.1170
Soft tissue	22(26.4)	20(25.7)	42(100.0)	0.8274
Urinary tract	11(44.0)	14(56.0)	25(100.0)	0.5721
Bone	16(72.7)	6(27.3)	22(100.0)	0.0060
Skin	9(52.9)	8(47.1)	17(100.0)	1.0000
Lymph node	7(50.0)	7(50.0)	14(100.0)	1.0000
Conjunctiva and orbit	3(37.5)	5(62.5)	8(100.0)	0.6193
Liver	3(75.0)	1(25.0)	4(100.0)	0.0372
Omentum	1(50.0)	1(50.0)	2(100.0)	0.0002
Brain	0(0.0)	1(100.0)	1(100.0)	1.0000
Total	156(34.4)	298(65.6)	454(100.0)	<0.0001

$p < 0.05$ is statistically significant

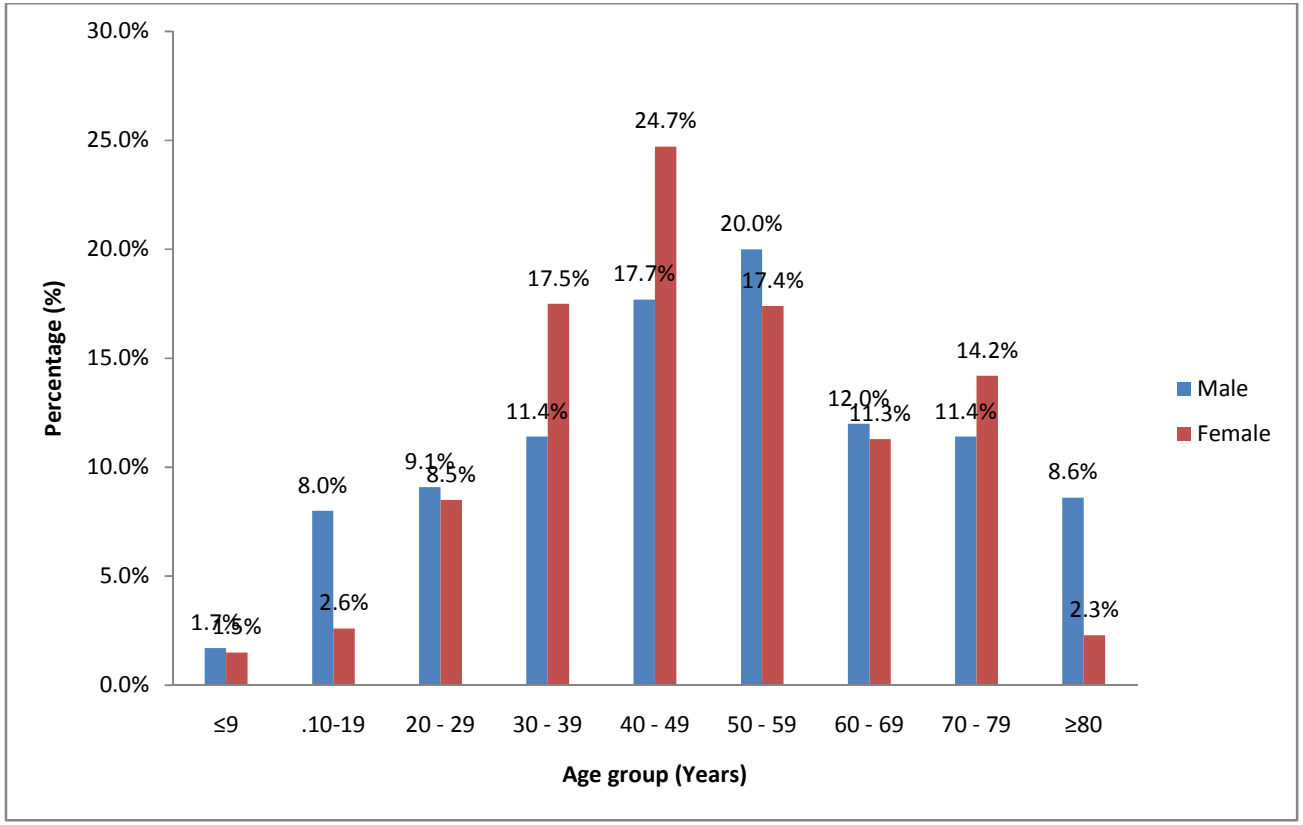

Fig. 1. Age characteristics of males and females diagnosed with cancers (1st June 2011 to 30th June 2016)

Breast cancer was the commonest female cancer followed by the uterine cervix. This agrees with previous studies in Ghana [17] and other parts of the world [18-22]. However, this disagrees with other studies in Sub-Saharan Africa and beyond which reported that that cancer of the uterine cervix to be the commonest malignancy in female [10-11,23-26].

The male genital tract cancers reported in our Institution during the period were as follows: prostate (65.2%), penis (26.1%), Testis (4.3%) and the scrotum (4.3%). This pattern is similar to those of other studies of Kluffio [27] and Parkins et al. [26]. The common female genital tract malignancies were the following: uterine cervix (70.3%), ovary (16.5%), uterus (8.5%), vagina (2.6%), vulva (1.7%) and the fallopian tube 1(0.4%). This is similar with the previous findings conducted in Southern parts of Ghana [28,29].

Breast cancer was found to be more common in women in compared to men ($p< 0.0001$), a finding that was expected. However, the prevalence of 3.7% male breast cancer among all BCs is closer to the 2.9% reported in Southern Ghana [30,31] but lower than 6.1% reported by Iman et al. [32] form Kano, Northwestern Nigeria This potentially suggests that male breast cancer is not rare in Ghana, particularly in the Northern part of the country. Health education on the occurrence of male breast cancer among Ghanaian men and the risk factors should be incorporated into the ongoing female breast cancer awareness campaign. Also, the importance of histopathological examination of tissues/lumps surgically remove from patients should be carefully explained to clinicians, as well as patients and their relatives. Again, the present study found that upper and lower urinary tract cancers were slightly more prevalent in females. This finding disagreed with previous studies in Australia [33] and the United States of America [34,35] that reported the disease to be more common in men in compared to women.

The present study also found that urinary tract and conjunctiva/orbital malignancies were more common in females (except breast cancer), while all other cancers were slightly more common in males. For instance, gastric and oesophageal cancers were more common in males than in females. The predominance of gastrointestinal tract (GIT) malignancies in males is similar to previous findings in Ghana and worldwide [36-38]. GIT cancers in both males and females were also found to be the common among the elderly. The age characteristics of GIT malignancies in this review work are similar to previous studies [39,40]. Similarly, bone malignancies were significantly common in males ($p< 0.0006$) than in females. This is in accordance with the previous studies that reported bone tumours were more frequent in males than females in Turkey [41,42]. When soft tissue malignancies were examined, they were found to be slightly more common in males than females. This differs from the studies of Dabak et al. [41] reported the female predominance, but in line with the study of Solooki et al. [43], reported that soft tissue tumours were more frequent in males than females. Regarding clinico-pathological characteristics of head and neck cancers, (HNCs) this study found male predominance, with the larynx being the most common site. Also, invasive squamous cell carcinoma was the most prevalent histological subtype for all the head and neck cancers. Similar observations were reported in literature across the globe [44-47]. It seems that a higher rate of HNC in this study might be attributed due to changes in lifestyle and environmental exposures such as increased smoking and alcohol consumption among men [47]. However, this fact requires further studies directed at the aetiology of HNCs in Northern Ghana, since that was not the focus of this baseline study.

This retrospective study might be a reflection of the categories of specialists and the activity of the various units within the TTH and other hospitals in Northern Ghana. This is possibly because most of these health facilities except the TTH are located within the remote Districts of Northern Ghana where some specialists and medical doctors refused to accept posting to render services, a time old problem in this country.

5. CONCLUSION

In this baseline study, cancers were found to be the common among females in compared to their male counterparts. The mean age at diagnosis was relatively younger for the females. The common male cancers were gastric, soft tissue, larynx and prostate. The common male genital tract cancers were prostate and the penis. Similarly, the common female cancers were: breast, uterine cervix, ovary and gastric, with common genital tract cancers being the uterine cervix and the ovary. Breast, urinary system and conjunctiva/orbital malignancies were significantly common in females, while all other malignancies were male dominated.

CONSENT

The permission was obtained from the head of the department of pathology of the Tamale Teaching Hospital.

ETHICAL APPROVAL

As per international standard or university standard ethical permission has been collected and preserved by the authors.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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