ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF CLINICAL ONCOLOGY

ADMISSION PATTERN AND TREATMENT OF SOLID TUMORS AT TIKUR ANBESSA SPECIALIZED HOSPITAL RADIOTHERAPY CENTER FROM JULY 2020 TO FEBRUARY 2021.

BY

GEBREKIRSTOS HAGOS (MD, FOURTH YEAR CLINICAL ONCOLOGY RESIDENT)

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE DEPARTMENT OF CLINICAL ONCOLOGY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF SPECIALITY IN CLINICAL ONCOLOGY.

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ADDISS ABABA, ETHIOPIA

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ACRONYMS

AA	Addis Ababa
AACCR	Addis Ababa City Cancer Registry
AAU	Addis Ababa University
AIDS	Acquired Immune Deficiency Syndrome
CRC	Colo-rectal Cancer
CHS	College of Health Science
DM	Diabetes Mellitus
EBRT	External Beam Radiotherapy
FMOH	Federal Minister of Health
GLOBOCA	Global Burden of Cancer
HC-W	Health Center Ward
HDR	High dose rate
ICT	Information Communication technology
IAEA	International Atomic Energy Agency
OPD	Out Patient Department
RVI	Retro Viral Infection
RT	Radiotherapy
SNNPR	South Nation Nationalities People region
SPSS	Statistical Package for Social Science
SSA	Sub-Saharan African Countries
TASH	Tikur Anbesa Specialized Hospital
TASH-W	Tikur Anbesa Specialized Hospital Ward
UN	United Nation
WHO	World health organization

ABSTRACT

Background: The incidence of cancer has increased dramatically worldwide in the last two decade. Cancer in sub-Saharan Africa (SSA) is on the rise caused by a rapid population growth, increased life expectancy and adoption of unhealthy lifestyles. In Ethiopia the incidence of cancer is increasing over years with an estimated 67, 573 new cases and over 46, 373 deaths in 2018. At TASH RT center there was no study that tried to evaluate admission pattern and intent of therapy of solid tumors. So this study was conducted to determine admission pattern and treatment intent of solid tumor in TASH radiotherapy (RT) center.

Objective: To assess the admission pattern and treatment intent of Solid Tumors at TASH RT center from July 2020 to February 2021.

Method: A cross sectional study was conducted to assess admission pattern and treatment of solid tumors among patients admitted for chemotherapy in TASH RT wards from July 2020 to February 2021 who fulfilled the inclusion criteria. Data was extracted from the Oncology Patient Registration System, then it was checked for completeness. Descriptive statistic was conducted using SPSS version 23. Association of patient address with cancer stage and intent of therapy was evaluated.

Result: A total of 434 patients were admitted during the study period. Median age was 43.0 years, ranging from 18 years to 80 years. Almost half (50.5%) of the patients were females and most patients (87.6%) had no any known comorbidity and 7.4% had HIV infection. Most of the patients came from Addis Ababa City (44.5%), followed by Oromia region (30%) and Amhara region (11.8%). The most common anatomic sites of the cancers were GIT (37.1%), head and neck (25.6) and genito-urinary (15.0%). Based on histology, adenocarcinoma and SCC accounted for about 38.5% and 36.9% respectively. Most patients were admitted with stage IV (72.1%) and stage III accounts 21%. The treatment intent was palliative in 59.4%, neo-adjuvant in 23.3%, adjuvant in 14.3% and radical in 3%.

Conclusion: Most patients presented with advanced stage and more than half of all the patients were treated with palliative intent.

Key words: Treatment pattern, Solid tumors, Tikur Anbesa specialized Hospital

1. INTRODUCTION

1.1. Background

Solid tumor is a solid mass of cancer cells that grow in organ systems and can occur anywhere in the body, like breast and cervical cancers. During the last two decades the incidence of cancer has increased worldwide in an ascending pattern. The type and pattern of cancer varies in geographical region, people's life style and socioeconomic developmental status of a given country. Cancers that once were rare and considered the diseases of developed nations, like cancers of colon, breast and lung, now are frequently diagnosed in developing countries (1). The proportion of cases diagnosed in developing countries is projected to increase from 56% in 2008 to more than 60% in 2030 (2). Oncology service in Ethiopia is at its young age, started in 1998 at TASH RT center. Like most SSA countries, Ethiopia has no national cancer registry. As far as we know there is no a study on admission pattern and treatment of solid tumors at our center.

1.2. Statement of the problem

Cancer ranks as a leading cause of death and an important barrier to increasing life expectancy in every countries of the world (3). According to estimates from the World Health Organization (WHO) in 2019, cancer is the first or second leading cause of death in age younger than 70 years in 112 of 183 countries (4). Overall, the burden of cancer incidence and mortality is rapidly growing worldwide; this reflects both aging and growth of the population as well as changes in the prevalence and distribution of the main risk factors for cancers (5). Worldwide, an estimated 19.3 million new cancer cases and almost 10.0 million cancer deaths occurred in 2020. For both sexes combined, one-half of all cases and 58.3% of cancer deaths are estimated to occur in Asia in 2020, while Europe accounts for 22.8% of the total cancer cases and 19.6% of the cancer deaths. In contrast to other regions, the share of cancer deaths in Asia and Africa are higher than the share of incidence because of the different distribution of cancer types and higher case fatality rates in these regions (6).

Cancer in SSA is on the rise caused by a rapid population growth, higher life expectancy and adoption of unhealthy lifestyles (7). According to United Nation (UN) estimates, the population of the continent will double from 1.2 billion people in 2015 to 2.5 billion in 2050 (8). Cancer therapy options in most SSA countries are sparse and when available, they are unable to sufficiently serve patients' need (9). The Concord 2 study has shown that cancer survival rates differ significantly around the world, with Africa in last place for most types of cancer (10). This striking fact is most likely due to late stage at presentation and poor access to treatment (10,11).

Cancer continues to receive low public health priority in Africa. This is due to the limited health resources and other pressing public health issues such as malaria, tuberculosis, and acquired immune deficiency syndrome (AIDS) (12).

Ethiopia, a country with population size of more than 117 million, the incidence of cancer is increasing over the years with an estimated 67,573 new cases and over 46,373 deaths in 2018. Except Addis Ababa City Cancer registry (AACCR) which was established in 2011 (13), there is no comprehensive cancer statistics in the country which clearly show the overall progress of the disease over the years. In addition, in the country currently the only cancer center with comprehensive cancer service is TASH RT Center, established in 1998 (14). So there is huge gap between the demand and the availability of oncology service in the country. For this reason the ministry of health is expanding radiotherapy services to five regional teaching hospitals across the country (15).

At TASH RT center cancer patients took their therapy either as out patient , at day care or at the wards. Only adult patients diagnosed with solid tumors are given treatment at clinical oncology department. Patients admit to the wards either for chemotherapy or other supportive oncology therapy like transfusion, pain management, infection and other oncology emergencies. Patients admitted to the TASH RT ward either for neo-adjuvant, adjuvant, radical and palliative intent chemotherapy. They admitted to the wards if the duration of administration of chemotherapy is one and more days usually one to five days.

In our center there is no adequate study which evaluates patterns of admission and treatment of solid tumors. There are two related retrospective studies done in TASH RT center, one study on pattern and type of cancer patients from AACCR during 1998 to 2010 and the other study on pattern of RT treatment at TASH RT center. The studies were not specific for cancer patient who

were admitted and took chemotherapy at RT wards. Hence, this study will help to determine patterns of solid tumors in respect to site and sub sites, group stage, histology and intent of therapy. It will also evaluate incidence and types of comorbidity, and patient demography data (like age, sex, address).

1.3. Significance of study

This study will help to determine patterns of admission and treatment of solid tumors in our center in relation to address, age, male to female ratio, site, sub site and specific histology. It will also determine the stage of all cancer patients admitted for chemotherapy to the wards during study period. Essentially it gives clear data on the intent of therapy provided for the patients. Based on the group stage and intent of therapy it gives information and open a way for other study. This study can stimulate others to study pattern of cancers and treatment in other part of the country. It will also help to develop the same cancer registration system to other oncology centers in the country so that representative data can be collected on the patterns of cancers in Ethiopia. Additionally it can be a good input for healthcare policy makers in relation to investment on health personnel, oncology centers, oncology devices, and medications.

2. Literature review

Based on GLOBOCO 2020 report female breast cancer is the most commonly diagnosed cancer followed by cervical cancer while in men prostatic cancer, lung cancer and colorectal cancer are the leading cancers (4).

A report on patterns of cancers across India between 2012 and 2016 shows nasopharyngeal, hypopharyngeal, esophageal, gastric and liver cancers were the most common types of cancer in decreasing order (16).

A retrospective study over ten years (2002-2011) in a teaching hospital at North west Tanzania on stage at presentation, clinico-pathology and pattern of treatment on 384 breast cancer patients showed median age of 45 years, 97.9% patients were female. The study also showed invasive ductal carcinoma was the most common histology (91.7%) and 63% of the patients was stage III at presentation, while stage IV were 21.4% of the cases (17)

A prospective study in Western Kenya on 5365 cancer diagnosed from January 1999 to December 2006 shows male to female ratio 1:1, with 79% of patients have solid tumor. Among the solid tumors, cancer of esophagus was the commonest followed with breast cancer and Kaposi sarcoma (18).

According to a retrospective study in Kampala Uganda from January 1995 to 1998, from 2601 patients, 47.1% patients were male and 51.9% were female patients. Most common cancer among male were Kaposi sarcoma (37.1%) followed by prostatic cancer, lymphoma & esophageal cancers, while the most common cancer in female in decreasing order were cervical cancer (22.2%) followed by Kaposi sarcoma and breast cancer (19-23).

One year retrospective study at one Nigeria University hospital Oncology ward from June 2018 to 2019 on 318 patients which were female predominance (66.4%) and more than half of the patients were aged 40-59 years, and commonest anatomic sites were breast (25.5%), cervical 23%), head and neck (13.5%), and most patents present with stage IV disease(31.4%) (20).

A descriptive and cross sectional study on pattern and frequency of all cancers in one of the level five hospital in Kenya between April 2019 to July 2019 on 574 patients shows median age of 57.2 years and 36.4% of male patients, the rest being female patients. The most common tumors in decreased order were cervical cancer (24%), breast cancer (14%), esophageal cancer (13.4%), gastric cancer (10.1%), and prostate cancer(5.1%) (21).

Based on a retrospective study from the first two years of registrations of AACCR (2012-2013), where 4139 cancer cases were collected from 22 hospitals, clinics, diagnostic centers and results shows female predominance (67% of cases). Breast cancer (31.5%) and cervical cancer (14.1%) were the most common cases in female while colorectal (10.6%) and Hodgkin's lymphoma (10.2%) were the most common cases in male (13).

A cross sectional study on breast cancer care in Gondar, North Ethiopia, between 2016 and 2017 was conducted on 82 patients. Most of the patients were female (82%) and median age of patients was 42 years and most patients were advanced cases and the commonest histology type was ductal carcinoma (74%) followed carcinoma not otherwise specified (22).

Using Addis Ababa city cancer registry to estimate incidence of cancer in Ethiopia on 8539 patients shows female predominance (female:male ratio was 2:1), most common cancer in adult males were colo-rectal cancer (CRC), Non-Hodgkin's lymphoma (NHL), and prostate while common cases in adult female was breast cancer, cervical cancer and CRC (23).

A retrospective study to identify pattern and type of cancer based on hospital registration at TASH RT center from 1998 to 2010, where 12,671 patients were analyzed and top 4 address patients came in decreased order includes Addis Ababa city, Oromia region, Amhara region and South Nation Nationalities People region (SNNPR), most of them were female patients (72.8%), diseases characteristic by stage includes stage I and II accounts 10% each, stage III and IV combined were 32%, while 32% the cases were unknown stage. From this study commonest type of tumor by anatomic site were head and neck (22%), sarcoma (15%), GIT (12%) in men and Gynecology malignancy combined (47%), breast cancer (26%), head and neck (5%) and sarcoma (5%) in female patients (24).

Other study in our center on pattern of RT treatment in Ethiopia which was retrospective from 2015 to 2018 on 1823 patients who took RT in the center showed 98% adult, 78% female patients, 5% of the patients were retro-viral infection (RVI) infected, 30% of the patients came from AA city, and their median age were 48 years. From the study most common types of cancer who took RT during the study period were cervical cancer (47%), breast cancer (15%) followed by head and neck cancers (10%). The study also shows most of the patients had locally advanced (stage III and IV combined were 73.5) while stage I and II constituents 18.3% of the cases. Most of the patients (62.4%) took their RT for palliative indication while 37.6% was for curative purpose (25).

3. Objectives of the study

3.1. General Objective

- To assess the admission pattern and treatment intent of solid tumors at TASH RT Center from July 2020 to February 2021.

3.2. Specific objectives

- To describe the admission pattern of solid tumors at TASH RT center from July 2020 to February 2021.
- To determine treatment intent of solid tumors among patients admitted to TASH RT center from July 2020 to February 2021.

4. METHODS AND MATERIALS

4.1. Study area and study period

The study was conducted from September 2021 to November 2021. It was conducted in TASH RT center, Addis Ababa Ethiopia. TASH is multi-specialty tertiary teaching hospital that opened on 1972. TASH is now the main teaching hospital for the majority of clinical and pre-clinical training in the country. It is an institution that offers specialized clinical services that some of them are not available in other public or private institution in Ethiopia (26). Furthermore, almost all regional and federal hospitals in Addis Ababa city are affiliated with school of medicine through its clinical services and training sites. The RT center was established 25 years back with the help of International Atomic Energy Agency (IAEA), and currently it has two Cobalt-60 tele-therapy units and one high dose rate (HDR) brachytherapy unit dedicated for gynecologic malignancies. The center also started computed tomography (CT) simulation, and installed LINAC machine recently and started conformal RT in December 2020. Six full time consultant oncologists, three medical physicists and eight radiotherapy technologists are currently working in the center. The center had started training of clinical oncology in 2013 and currently 36 residents are attending their residency. Activities of the center include outpatient clinic for new patient evaluation and follow up. It has two wards for inpatient chemotherapy with total of 33 beds where two of the beds are dedicated for emergency patient admission. The center also has day care center for outpatient chemotherapy administration.

Figure 1: Study area (TASH RT center, Addis Ababa city, Ethiopia)

4.2. Study design

Institution based cross sectional study was conducted on patients with solid tumors admitted to either of the two wards for chemotherapy at TASH RT center from July 2020 to February 2021.

4.3. Source of data

Data was collected from the department registration system (Oncology patient registration system)

4.4. Source population

All solid cancer patients managed at TASH RT wards from July 2020 to February 2021.

4.5. Study population

Patients with Solid cancer admitted to TASH RT wards during the study period fulfilling the inclusion criteria

4.6. Eligibility criteria

4.6.1. Inclusion criteria

- ✓ All adult patients diagnosed with solid cancer and admitted for chemotherapy at TASH RT wards from July 2020 to February 2021

4.6.2. Exclusion Criteria

- ✓ Patients whose data is missing any one of the variable.
- ✓ Patients admitted for other reasons like emergency management, transfusion
- ✓ Patients for which their diagnosis not confirmed with histology

4.7. Study Variable

Age	Address	Comorbidity
Sex	Site of cancer	Histology type
Stage	Intent of therapy	

4.8. Sample size and sampling method

As all patients admitted to either of the oncology wards from July 2020 to February 2021 fulfilling the inclusion criteria were included in the study, sample size calculation is not needed.

4.9. Data collection tool and procedure

A new comprehensive registration system to capture all information of oncology patient was developed by Oncology department and ICT team of TASH. This system records patient information which includes address, sex, age, cancer site, sub site, histology, stage and intent of treatment. As a pilot study the principal investigator fed the system 83 patients and modified the system after discussion and feedback was given all staffs of the department.

From July 2020 every resident started to record every patient he or she evaluated in the oncology wards to the system. By February 2021 a total of 977 patients were recorded. At this time for every record or repeated admission the system was considering as new patient even though previously recorded. The list of patients was exported from the system in excel form. We excluded repeatedly recorded patient with same hospital record number for repeated admission and 35 patients were excluded based on exclusion criteria (no histology or patients admitted for

emergency management). This results in final sample size of 434. The remaining list was checked for completeness of required variables.

The variables recorded in the system includes: date of evaluation, age, sex, address, site of tumor, sub site of tumor, histology, stage of the cancer, intent of therapy, previously oncology treatment and any comorbidity.

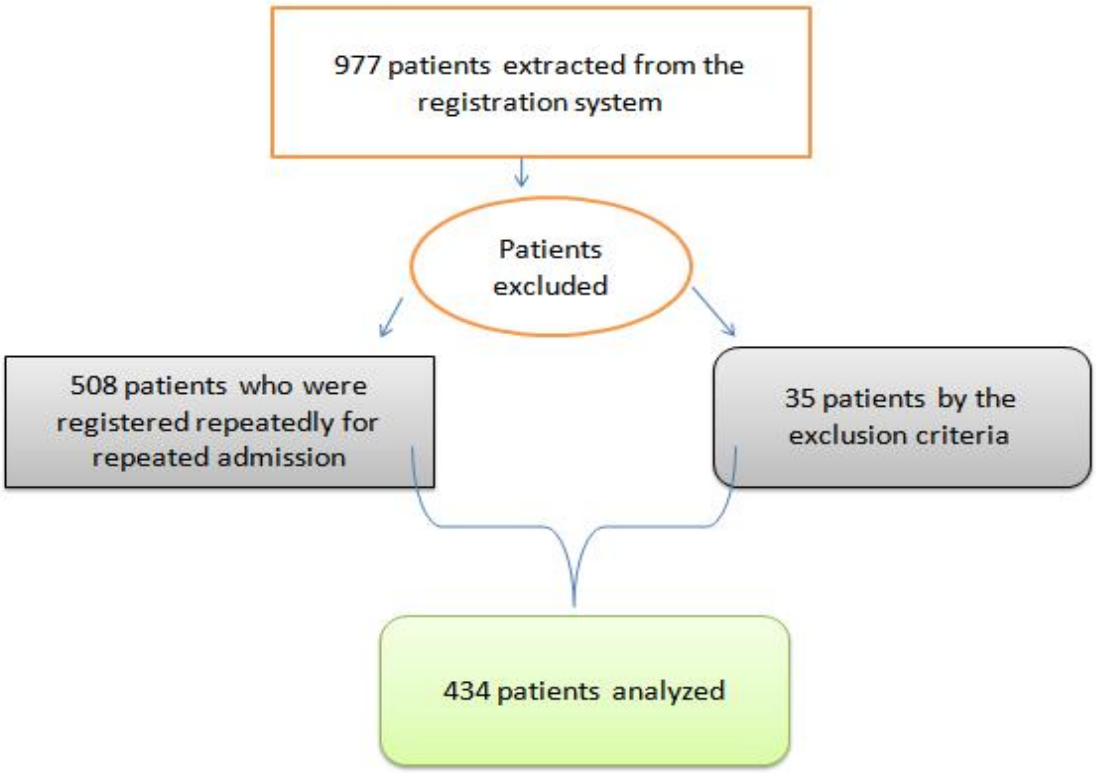

Figure 2: Flow chart of data collection procedure

4.10. Operational definition

Solid tumor- a solid mass of cancer cells that grow in organ systems and can occur anywhere in the body.

Group Stage: it is combined score of T, N & M stages based eighth edition of American Joint Committee on cancer.

Intent of therapy: A specific endpoint sought in a line of oncology therapy like cure, palliation (improve quality of life and prolongation of life), neo-adjuvant/converting (shrinkage of tumor) and adjuvant therapy.

4.11. Data processing and Analysis

The data was coded, entered and cleaned using Excel. Then it was exported to SPSS version 23 for analysis. Descriptive statistical analysis including simple frequencies, measures of central tendency and measures of dispersion was used to describe the data. The data was computed using different statistical methods like mean, standard deviation, and others. Chi square test was also used to assess association of patient address with cancer stage and intent of therapy. Then it was presented using frequencies, summary measures, tables, and figures.

4.12. Ethical consideration

An ethical clearance for the study was obtained from Addis Ababa University, College of Health Science Department of Clinical Oncology. This research was done from the data on the department cancer patient registration system. Confidentiality was maintained at all levels of the study by avoiding the use of names and any other identifiers. Results are in aggregates without personal identifying information.

4.13. Dissemination of results

This result will be submitted to Department of Oncology, Addis Ababa University College of Health Science. The findings will be presented at department level and different conferences and workshops. It will also be presented to FMOH through presentation and hard copy. Finally it will be sent for possible publication in national and international medical journals.

5. RESULT

5.1, Patients Socio-demographic characteristics

A total of 434 patients were admitted for chemotherapy in TASH RT ward from July 2020 to February 2021 and were reviewed and included in the study resulting in response rate of 100%. The median age of the patients was 43.0 years with a minimum and maximum age of 18 years and 80 years old respectively. Majorities (64.5%) of the patients were admitted at TASH ward and 50.5% (219) of them were females. About 193 (44.5%) of the patients were from Addis Ababa, followed by Oromia (30%) and Amhara (11.8%) regional states (Table 1, Fig 3). Although far majority of the patients (87.6%) had no comorbidities, about 7.4% and 2.3% of the patients had RVI and diabetes mellitus respectively

Table 1: Socio-demographic characteristics of patients admitted to TASH RT wards from July 2020 to February 2021 in Addis Ababa, Ethiopia.

Variables		Frequency	Percent
Wards where patient were admitted	TASH-W	280	64.5
	HC-W	154	35.5
Gender	Male	215	49.5
	Female	219	50.5
Address of patients	Addis Ababa	193	44.5
	Oromia	130	30.0
	Amhara	51	11.8
	SNNPR	42	9.7
	Others addresses	18	4.1
Comorbidities	No Comorbidities	380	87.6
	RVI	32	7.4
	Diabetes Mellitus	10	2.3
	Hypertension	5	1.2
	Others	7	1.6

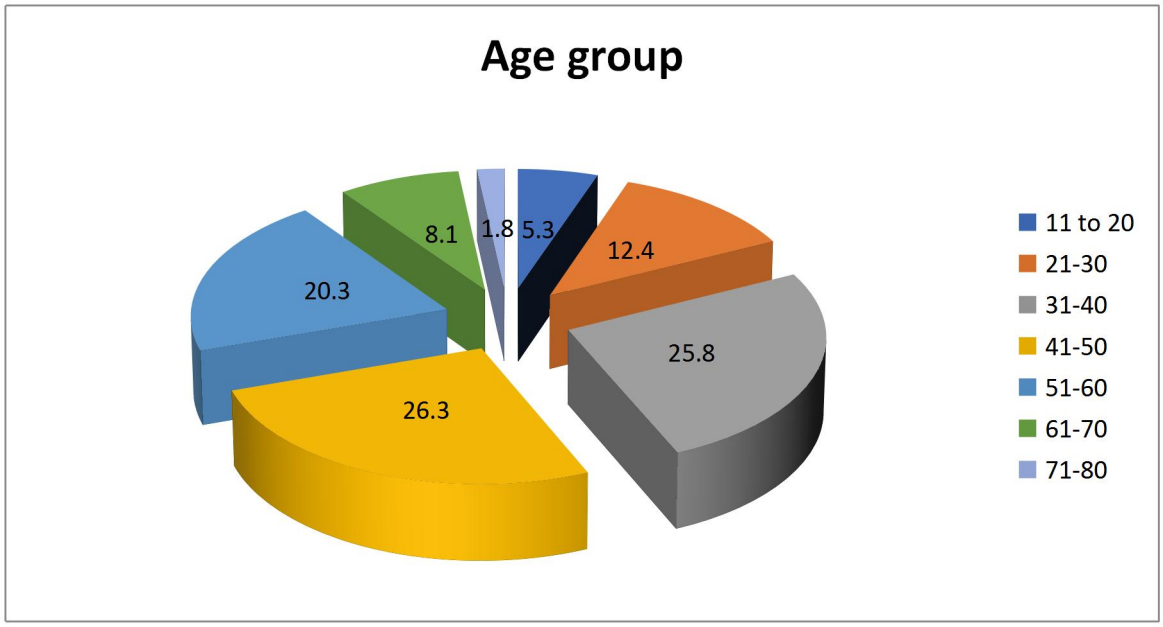

Figure 3: Age distribution of patients admitted at TASH RT wards from July 2020 to February 2021 in Addis Ababa Ethiopia.

5.2, Cancer Characteristics

Gastrointestinal tract (GIT) was the most common site of the tumors (37.1%) followed by head and neck (25.6%) and genito-urinary malignancy (15.0%). The commonest tumor sub-sites were colo-rectal (20.3%), nasopharyngeal (10.6%) and esophageal cancers (9.9%). Histology types were adenocarcinoma in 38.5% cases, SCC in 36.9% and undifferentiated carcinoma in 6.2%. Majority of patients were admitted with stage IV cancer (72.1%) followed by stage III (21.0%), while stage I and II combined accounts 6.9% of the cases (table 2, Figure 4).

Table 2: Tumor characteristics of patients admitted at TASH RT wards from July 2020 to February 2021 in Addis Ababa, Ethiopia.

Variables		Total		Male		Female	
		Freq.	%	Freq.	%	Freq.	%
Group stage	Stage I	8	1.8	5	2.3	3	1.4
	Stage II	22	5.1	12	5.6	10	4.6
	Stage III	91	21.0	48	22.3	43	19.6
	Stage IV	313	72.1	150	69.8	163	74.4
Tumor sites	GIT	161	37.1	77	35.8	84	38.4
	Head and neck	111	25.6	78	36.3	33	15.1
	Genitourinary	65	15.0	8	3.7	57	26.0
	Lung	24	5.5	14	6.5	10	4.6
	Bone tumors	19	4.4	14	6.5	5	2.3
	Soft tissue sarcoma	18	4.1	9	4.2	9	4.1
	others	36	8.3	15	7.0	21	9.6
Tumor sub-site	Colon-Rectal	88	20.3	41	19.1	47	21.5
	Nasopharyx	46	10.6	31	14.4	15	6.8
	Esophagus	43	9.9	21	9.8	22	10.0
	Cervical	34	7.8	0	0	34	15.5
	Lung	23	5.3	13	6.0	10	4.6
	Oral cavity	21	4.8	16	7.4	5	2.3
	Others	179	41.2	93	43.3	86	39.3

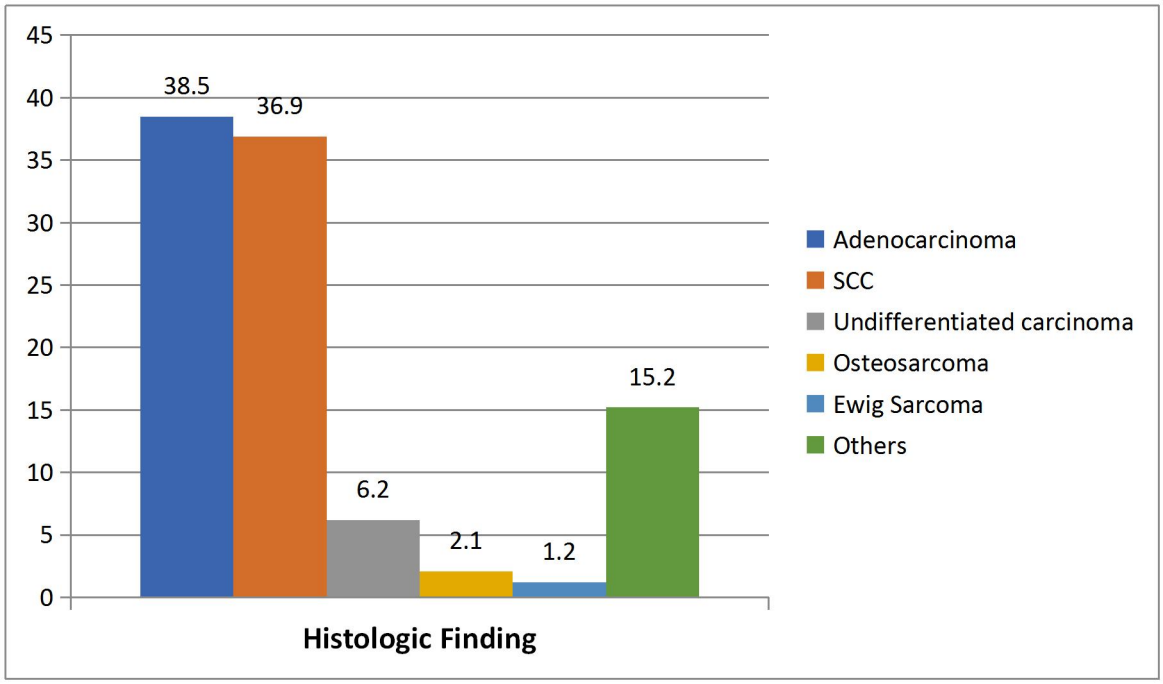

Figure 4: Histology finding of patients admitted at TASH RT wards from July 2020 to February 2021 in Addis Ababa, Ethiopia.

Head and neck cancer (36.3%) was the most common site of tumor among males whereas GIT (38.4%) was the most common site among females. Similarly, the commonest tumor sub-site in both males and females was colorectal cancer which account 19.1% and 21.5% respectively (table 2). Regarding the group stage of the tumors, there was almost similar distribution in both males and females (Table 2).

Squamous cell carcinoma (37.2%) was the most common histology type among males followed by adenocarcinoma (33.0%) and undifferentiated carcinoma (7.9%). Adenocarcinoma (43.8%) followed by SCC (36.5%) were the commonest among females.(Figure 5).

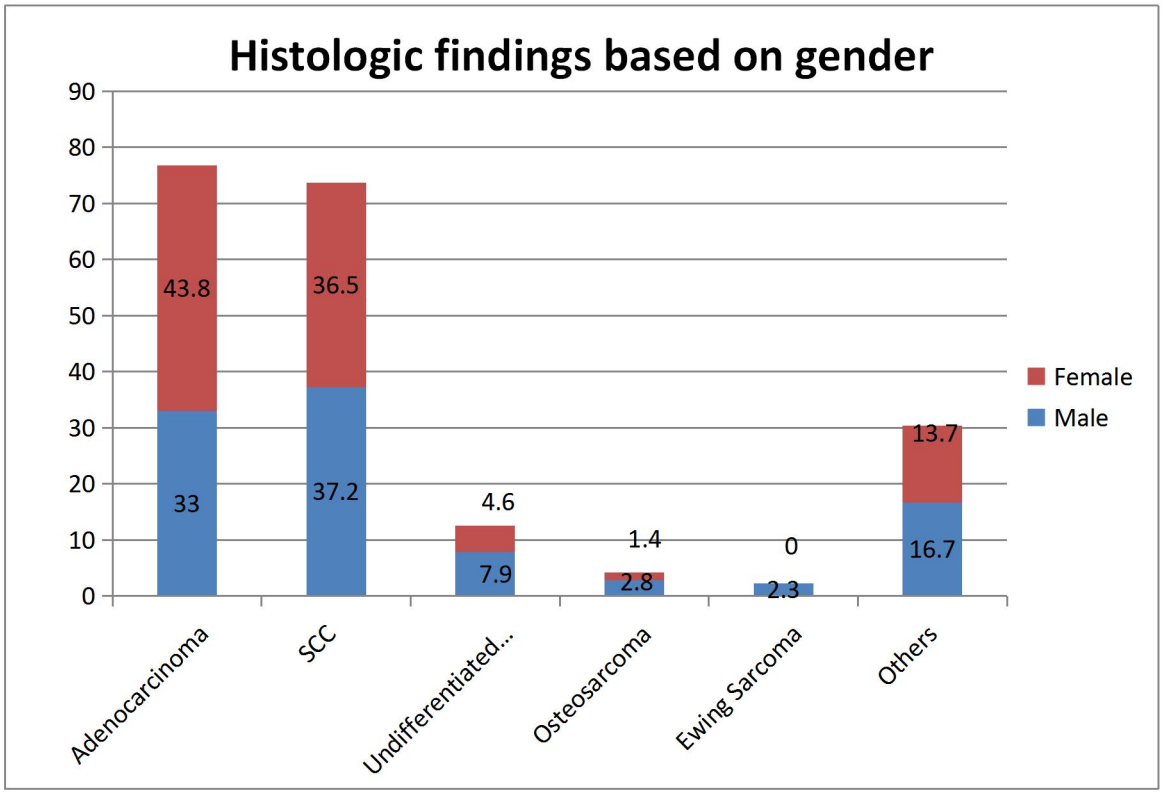

Figure 5: Gender based histology finding of patients admitted at TASH RT wards from July 2020 to February 2021 in Addis Ababa, Ethiopia.

5.3, Patients treatment Intent

Majority patients were admitted for palliative treatment intent (59.4%), followed by neo-adjuvant (23.3%) and adjuvant (14.3%) intents. Waiting time from patient diagnosis with cancer at TASH RT OPD to first admission for chemotherapy is known in 273 patients (62.9%), with mean waiting time found to be 51.0 days with minimum and maximum values of zero and 233 days respectively (Figure 6).

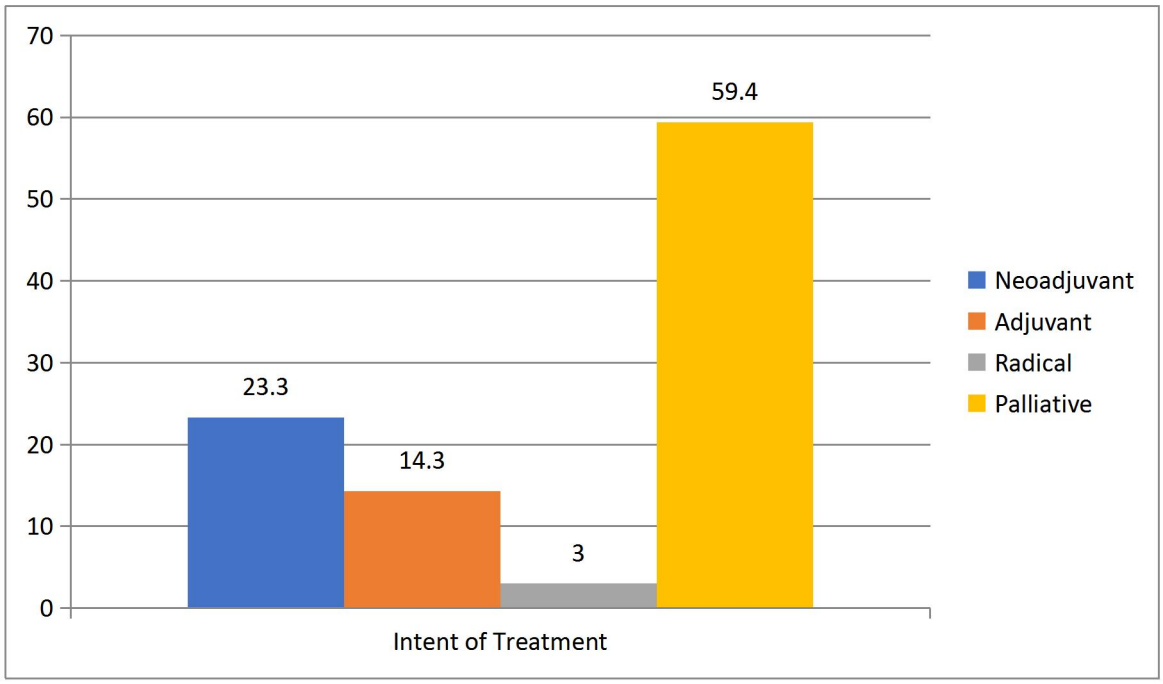

Figure 6: Intent of treatment of patients admitted at TASH RT wards from July 2020 to February 2021 in Addis Ababa, Ethiopia.

Majority (37.6%) of the patients had no history of previous oncology therapy. But, 30.6% of the patients had surgery and 15.7% of them had combined previous oncology therapy (Table 3).

Table 3: Previous cancer treatments of patients admitted at TASH RT wards from July 2020 to February 2021 in Addis Ababa, Ethiopia.

Variables		Frequency	Percent
Previous therapy given	Surgery	133	30.6
	Chemotherapy	38	8.8
	Radiotherapy	23	5.3
	Combined therapy	68	15.7
	None	163	37.6
	Others	9	2.1

5.4. Results of analysis of association between some variables

Chi square test was conducted to assess for any association between patient address, site and sub-site of tumors with stage and intent of therapy. No association of patient address with cancer stage or intent of therapy was found.

6. DISCUSSION

Median age of the patients in this study was 43.0 years, ranging from 18 to 80 years. This is consistent with study done at teaching hospital at North west Tanzania where median age of 384 patients was 45 years (17). 50.5% of the patients in our study were female, which is comparable with a retrospective study done at Kampala Uganda where 51.1% of patients were female (19), but two study from Addis Ababa City Cancer registry shows significant female predominance (13,23). This difference in gender distribution between our study and previous studies in the center can be due to females diagnosed with two of common cancers (breast and cervical cancers) are not usually admitted for chemotherapy to the wards. While Addis Ababa City population is 4.3% of Ethiopia population, 44.5% of the patients came from Addis Ababa City, followed by Oromia region (30%) and Amhara region (11%) which is similar to a study done at TASH RT center which showed the same order of patients' address (24). The reason why most of the patients came from Addis Ababa City can be due to patient proximity to TASH RT center, oncology centers providing chemotherapy administration are increasing in regional hospitals, and probably high health seeking behavior of Addis Ababa City population.

Cancer types based on the anatomic regions, the three most common sites on decreasing order are GIT (37.1%), head and neck (25.6%) and gynecologic malignancy (15.0%). Based on anatomic sub sites of tumors, common sub sites are colo-rectal cancer (20.3%), nasopharyngeal carcinoma (10.6%) and esophageal cancer (9.9%). Although the magnitude vary, the three common sub sites of tumors in this study, at least one of them were common from a study in Western Kenya where esophageal cancer was the most common (18). Esophageal cancer was also common sub site (13.4%) in another study in one of level five hospitals in Kenya (21). Nasopharyngeal and esophageal cancers were among the three common cancers in the pattern of cancer report in India from 2012 to 2016 (16). The common anatomic sub sites of our study differ from Nigeria hospital oncology ward study and Ethiopia study on pattern of RT treatment. In the Nigeria University hospital study, commonest sub sites were breast cancer (25.5%) and cervical cancer account 23% of the cases (20). The variation on anatomic sub sites between our study and the Nigerian study can be due to different chemotherapy administration schedule. Where in our center breast cancer is treated with chemotherapy in outpatient at day care and cervical cancer are treated with concurrent chemotherapy and radiotherapy without the need to

ward admission. We admit these two cancer types if the disease progressed while on outpatient treatment. In the other study in our center commonest anatomic sub sites who took RT from 2015 to 2018 were cervical cancer (47%) and breast cancer (15%) (255). The reason for this variation in the same center can be, these common female cancers are being managed as outpatient with chemotherapy or radiotherapy as stated above. In general the variation in anatomic sub sites of cancers in our study and other studies can be due to: patients treated with palliative care, surveillance, oral chemotherapy, chemotherapy at daycare and radiotherapy are not included in our study.

Based on histology adenocarcinoma (38.5%), SCC (36.9%) and undifferentiated carcinoma (6.2%) account the most common sub types.

This study showed that majority of the patients were stage IV diseases (71.2%) while stage III accounts (21.0%). This is comparable to a study in Tanzania teaching hospital where 63% were stage III and 21.4% were stage IV (17). Another study in Nigeria University hospital showed 31.4% the patient to be stage IV (20). A study from TASH RT on patients treated with RT, stage III and stage IV combined account 73.5% (25) which is similar to our result, where stage III and stage IV patients combined accounted 92.2%. Although results from our study shows most patients to be advanced stage like Tanzania and Nigeria study, patients in our study are more stage IV while in the above Africa countries are more to be stage III than stage IV. This can be due to late presentation of our patients to health facility, or delay of patient referral to oncology center and prolonged waiting time for chemotherapy admission.

Majority of our patients treated for palliative intent (59.4%) while 23.3% patients treated for neo-adjuvant and 14.3% for adjuvant intents. This is consistent with our finding on stage of the patients, as advanced diseases are likely to be treated with palliative intent. This is almost the same with a study on pattern of RT treatment in our center where 62.4% patients took the RT for palliative intent. Waiting time from cancer diagnosis to first chemotherapy admission was evaluated in 62.9% of cases and average waiting time is 51.3 days. Although there was long waiting time for chemotherapy, it is shorter comparing the waiting time for radiotherapy in our center which is 150 days (25).

With regard to comorbidities, most of our patients do not have known comorbidities (87.6%). But 7.4% and 2.3% have RVI and DM as known comorbidity respectively. HIV infection is higher in this study than in another study in our RT center done on 1823 patients, where 5% of the patients were retro viral infected (21).

We determine for possibility of association between addresses of the patients with group stage and treatment intent, and there is no association was found among them.

7. LIMITATION OF THE STUDY

The study did not include cancer patients who took palliative or radical therapy without admitting to the wards like day care, radiotherapy, and patients treated with oral chemotherapy or hormonal therapy.

8. CONCLUSION

Around half (50.5%) of our study population were female with median age of the 43.0 years. Most of the patients came from Addis Ababa City, followed by Oromia and Amhara Regional states. The common anatomic sub sites of the cancers were colo-rectal cancer, nasopharyngeal cancer and esophageal cancer in decreasing order. 71.2% of the patients were stage IV and most of them were treated for palliative intent. This study indicates most patients admitted to the oncology wards at advanced stage. This can be due to either late presentation or long waiting time for oncology therapy. As inpatient chemotherapy tend to select group of patients requiring hospital admission for chemotherapy, to get full picture of pattern and intent of therapy of the center, a study including patients treated with outpatient chemotherapy is recommended.

9. RECOMMENDATIONS

This study clearly shows most of our patients are stage IV and stage III, and the chemotherapy we are providing to the patients is a palliative intent. And the waiting time from cancer diagnosis to initiation of chemotherapy is prolonged. So to improve this we recommend;

1) Referring patients for chemotherapy to recently established oncology centers.

2) To diagnose more patients at early stage and to manage them with radical intent:

-Health education to the general public on symptoms of common cancers and to seek health services early.

-Increase capacity of health workers on early detection and referral of cancer patient to oncology center

-Expanding oncology centers across the nation.

-Expand national cancer screening programs.

3) To expand the cancer registration system in newly started oncology centers, so that to get relatively representative national cancer data.

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11. ANNEXES

Annex I-Data extraction tool

Variables		Values
1, Demographic data	1.1, Address	1, AA 2, Oromia 3 Amhara 4, SNNPR 5, Somalia 6, Tigray 7, Gambela 8, BenshangulGumuz 9, Afar 10, Dire Dawa
	1.2, Sex	1, Male 2, Female
	1.3, Age (years)	____
	1.4, ward	1, TASH-W 2, HC-W
2. Date of diagnosis (GC)		___/____/____
3. Date of first admission for chemotherapy (GC)		__/_____/_____
4. Time interval (in days) from diagnosis to first admission for chemotherapy		_____
5. Anatomy Sites of cancer		1, GIT 2, Head and neck 3, Gynecology 4, Lung 5, Bone tumors 6, Soft tissue sarcoma 7. Other sites
6. Anatomy sub sites of cancer		1, Rectal 2, NPC 3, Esophagus 4, Colon 5, cervical 6, Lung 7,oral cavity 8, Other sub sites

7. Cancer types by histology	1, Adenocarcioma 2, SCC 3, Undifferentiated carcinoma 4, Osteosarcoma 5, Ewing Sarcoma 6, Other histology
8. Group stage of cancer	1,I 2,II 3, III, 4, IV
9, Intent of therapy	1, Neoadjuvant 3, Radical 2, Adjuvant 4, Palliative
10 ,Any previous oncology therapy	1. Surgery 2. Chemotherapy 3. Radiotherapy 4. Combined therapy 5. Other therapy 6. None
11, Comorbidities	1, No Comorbidities 3, DM 2, RVI 4, Hypertension 5, Other comorbidity

Annex II-Assurance of investigator

I, the undersigned Clinical Oncology Resident agree to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the research and publications office of the Addis Ababa University.

Name of the Investigator:

GebrekirstosHagos(MD, Fourth Year Clinical Oncology Resident)

Signature_____ Date_____/_____/_____

Approval of the Primary Advisor

Advisor Name:

Dr. MathewosAssefa, Consultant Clinical Oncologist, Associate Professor of Medicine, AAU, CHS.

Signature_____ Date _____/_____/_____