ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

CLINICAL PROFILE OF CANCER PATIENTS VISITING EMERGENCY DEPARTEMENT OF TIKUR ANBESSA SPECIALIZED HOSPITAL

By Zerihun Tesfaye (MD.EMCCR3)

A RESEARCH THESIS TO BE SUBMITTED TO COLLEGE OF HEALTH SCIENCES, EMERGENCY DEPARTMENT, ADDIS ABABA UNIVERSITY IN PARTIAL FULFULLMENT OF THE REQUIRMENTS FOR SPECIALITY IN EMERGENCY MEDICINE AND CRITICAL CARE

October, 2020

ADDIS ABABA, ETHIOPIA

A RESEARCH THESIS TO BE SUBMITTED TO COLLEGE OF HEALTH SCIENCE, EMERGENCY DEPARTMENT, ADDIS ABABA UNIVERSITY IN PARTIAL FULFULLMENT OF REQUIRMENTS FOR SPECIALITY IN EMERGENCY MEDICINE AND CRITICAL CARE

By Dr. Zerihun Tesfaye (EMERGENCY MEDICINE AND CRITICAL CARE RESIDENT)

ADVISOR:

Dr. Tilahun Jiru (MD, Ass. Professor of Emergency and critical care)

Dr. Hywet Engida (MD, Ass. Professor of Emergency and critical care)

October, 2020

ADDIS ABABA, ETHIOPIA

Table of Contents

ACKNOWLEDGEMENT

First and foremost, I would like to thank my almighty God and then express my heartfelt gratitude to my advisor Dr. Tilahun Jiru and Dr. Hywet Engida for their invaluable advice, and comments.

I want to thank Addis Ababa University, college of health and medical science, department of Emergency and critical care for not only including research program as a postgraduate program but also giving it huge emphasis which I benefited much from such programs in terms of knowledge and experience.

I want to give my heartfelt gratitude to all patients that were willing to participate in this research.

Last but not least, I would like to thank my family and friends for all the comments, advice, and help they gave me.

ABREVIATIONS AND ACRONYMS

AAU: Addis Ababa University

ACS: Acute coronary syndrome

AKI: Acute kidney injury

AMA: Against medical advice

AOR: Adjusted odd ratio

COR: Crude odd ratio

DM: Diabetes mellitus

DVT: Deep venous thrombosis

ED: Emergency Department

ER: Emergency room

EMCCR: Emergency and critical care resident

GI: Gastrointestinal

GU: Genitourinary system

GLOBOCAN: Global cancer incidence, mortality and prevalence

HAI: Hospital acquired infection

MOH: Minster of health

PE: Pulmonary embolism

PI: principal investigators

TASH: Tikur Anbessa specialized hospital

UAWO: Upper airway obstruction

TLS: Tumor lysis syndrome

WHO: World health organization

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Background: Cancer is one of the major non-communicable diseases (NCDs), which include cardiovascular diseases, diabetes and chronic respiratory diseases. Cancer and its therapy may lead to urgent conditions. The care of cancer patients with emergency problems presents a challenge not only to medical oncologists but also to clinicians involved in emergency medicine. The main aim of this study is to analyze the clinical profile of oncologic patients presenting to adult emergency department of Tikur Anbessa specialized Hospital**.**

Methods: A prospective cross sectional study was conducted on oncologic patients who presented to emergency department of Tikur anbessa specialized hospital from February 2020 to June. The area selected for this research was TASH adult emergency unit, Addis Ababa, Ethiopia where the sample was collected from the patients who fulfill the inclusion criteria. SPSS software was used for analysis Univariate and bivariate analyses were performed for patient demographics and outcome. Multivariate logistic regression analysis was done to identify independent death-related factors.

Result: Total of 306 patients were found during study period and included in this study, out of which 120(39.2%) of the patients were males and 186(60.8%) were females. The mean age was 41.8±16.1. Most the patients (32.6) were initially seen in outpatient clinic of TASH.Around 60% of patients visited ED 4 months after onset of illness. The most common malignancy was hematology (n=107, 35%). Mean length of ED stay is3.16±1.86 days. Presentation by self-referral, arrival via ambulance and during night, lung, breast and neck location of cancer, having poor ECOG and having comorbidity (DM) were identified as factors associated with ED mortality of oncologic patients.

Conclusion: Cancer patients frequently seek non-scheduled medical care and admit to emergency departments for a range of conditions. Emergency physicians should develop consensus algorithms in collaboration with the oncology to manage the commonly encountered problems.

Key word: cancer patients; Pattern; Outcome; Length of stay

.

1. INTRODUCTION

1.1 BACKGROUND

The word cancer came from a Greek words karkinos to describe carcinoma tumors by a physician Hippocrates (460–370 B.C), but he was not the first to discover this disease. Some of the earliest evidence of human bone cancer was found in mummies in ancient Egypt and in ancient manuscripts dates about 1600 B.C. The world's oldest recorded case of breast cancer hails from ancient Egypt in 1500 BC and it was recorded that there was no treatment for the cancer, only palliative treatment. According to inscriptions, surface tumors were surgically removed in a similar manner as they are removed today(1)

Cancer is one of the major non-communicable diseases (NCDs), which include cardiovascular diseases, diabetes and chronic respiratory diseases. Together they cause over 60% of total global mortality every year. It is estimated that cancer kills over 7.9 million people globally every year constituting close to 13% of total deaths worldwide(2). While communicable diseases still remain the leading killers in many developing countries, the incidence and mortality from non-communicable diseases is rising rapidly. This has resulted in a 'double burden' of diseases. The overall burden of cancer in the world is projected to continue to rise, particularly in developing countries. It is projected that an estimated 21 million people will be diagnosed, and 13 million will die of cancer in the year 2030(3,4)

As of our understanding currently, the cause of cancer is multi factorial and not clearly and completely understood. Humans have proposed many theories about the causes of cancer through ages. Ancient theories like: humoral theory (Hippocrates) believed that the body contained 4 humors (body fluids), (a) blood, (b) phlegm, (c) yellow bile and (d) black bile. Any imbalance of these fluids will result in disease and excess of black bile in a particular organ site was thought to cause cancer. This theory of cancer was standard through the Middle Ages for over 1300 years(5). During this period autopsies were prohibited for religious reasons, thus limiting knowledge about cancer. The other is Lymph theory; it proposed that cancer formation was by fluid called lymph. Life was believed to consist of continuous movement of the fluids like as blood and lymph in the body. The lymph theory was supported in 17th century that tumors grow from lymph constantly thrown out by the blood. In the mid-19thcentury Blastema theory proposed by Muller. It demonstrated that cancer is made up of cells but not with lymph in 1838. His student, Virchow (1821-1902) determined that all cells including cancer cells were derived from other cells. Chronic irritation theory by Virchow proposed that chronic irritation was the cause of cancer. Later Thiersch showed that cancers metastasize through the spread of malignant cells and not through some unidentified fluid. In the early 20th century Trauma theory was also proposed and states that cancer was thought to be caused by trauma. There are also other theories like Parasite theory (18th century),

The risk factors for cancer are profoundly associated with socio-economic status; they are higher for populations with low-socio-economic-status populations, where cancer survival is

lower than in wealthier social settings. The risk factors for cancer can be broadly categorized into four types, namely behavioral risk factors, biological risk factors, environmental risk factors and genetic risk factors. Behavioral risk factors include tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity. Biological factors include overweight, obesity, age, sex of the individual and genetic/hereditary make up. Environmental risks include exposure to environmental carcinogens such as chemicals, radiation and infectious agents.(4,6)

In Ethiopia, according to Globcan 2012 report cancer accounts for about 5.8% of total national mortality. Although population-based data do not exist in the country except for Addis Ababa, it is estimated that the annual incidence of cancer is around 60,960 cases and the annual mortality is over 44,000. In Ethiopia, patients often present with advanced stages of cancer. For people under the age of 75 years, the risk of being diagnosed with cancer is 11·3% and the risk of dying from the disease is 9·4%. The most prevalent cancers in Ethiopia among the adult population are breast cancer (30.2%), cancer of the cervix (13.4%) and colorectal cancer (5.7%). About two-thirds of reported annual cancer deaths occur among women(2,4)

Cancer and its therapy may lead to urgent conditions. The care of cancer patients with emergency problems presents a challenge not only to medical oncologists but also to clinicians involved in emergency medicine. There are many kinds of problems for which cancer patients may require assistance in an emergency care facility. Cancer patients may often have complex medical problems in addition to the diagnosis of cancer, such as coronary heart disease, chronic obstructive pulmonary disease or diabetes mellitus. We can define an oncological emergency as an acute condition that is caused by cancer or its treatment, requiring rapid intervention to avoid death or severe permanent damage(7)

Currently, there are many identified oncologic complications. Some of which are real emergency conditions that requires early recognition and interventions. These oncologic emergencies are like neurologic emergencies common, occurring in 30–50 % of cancer patients presenting to emergency departments or for neurologic consultations at teaching hospitals. However, a few true neurologic emergencies require rapid diagnosis and treatment to preserve neurologic function and, in some circumstances, save lives. Malignant spinal cord compression, status epilepticus (SE), increased intracranial pressure (ICP), and intracerebral hemorrhage are neurologic conditions in cancer patients requiring urgent attention**:** Metabolic and Endocrine emergencie**s:** electrolytes abnormalities, Adrenal crisis, Hypoglycemia, hyperglycemia, hypothyroidism, thyrotoxicosis and carcinoid crisis are some of complications. Cardiac emergencies like Arrhythmia, ACS, Heart failure, Hypertension emergencies, pericardial diseases like pericarditis, pericardial effusions, pericardial tamponade, constrictive pericarditis. Airway and pulmonary emergencies like pneumothorax, pleural effusion, radiation induced lung injury, aspiration pneumonia, hemoptysis, malignant airways disease, pulmonary vascular disease, diaphragmatic dysfunction. GI emergencies like nausea and vomiting, constipation, diarrhea, ascites, SBP, hepatic encephalopathy, malignant gastroparesis, GI bleeding, pancreatic. Nephro-urologic emergencies like AKI, TLS, obstructive uropathy, hematuria. Infectious

emergencies like neutropenic fever, sepsis, pneumonia. Hematologic emergencies like Acute DVT and PE, hyperviscousity syndrome, hyper leukocytosis, anemia, thrombocytopenia. Others like chemotherapy related complications, psychiatric emergencies,(10)

Oncologic emergencies are conditions that oncologic patients develop due the cancer complication as well as treatment associated complications. There are multiple oncologic emergencies identified today. Early recognition and treatment of this conditions at emergency and wards have significant impact in the quality of life and also mortality rate of this patients. And knowing the prevalence of this oncologic emergencies and death related factors will guide us further for appropriate preparedness like resource allocation and knowledge gaps.

1.2 STATEMENT OF PROBLEM

Cancer patients can experience problems related to their disease or cancer treatment at all stages of the disease, leading to presentation at the emergency room. Patients can present with symptoms caused by primary malignancy, disease progression, recurrence, or complications of surgery, radiation therapy, chemotherapy, and immune deficiency. Cancer patients admitted through the ER generally have advanced disease and higher mortality compared with patients admitted or evaluated electively. The number of visits to the ER increases near the end of life.

As Ethiopia is still a developing country and most of the people are under poverty obviously there is high burden of infectious disease but at the same time due to different reasons like more sedentary life style, improvements in the attitude to seek health care and increased diagnosis ability figures are showing the prevalence of non-communicating diseases is constantly rising. Cancer is among the top problem. For this reason, Ethiopia Federal Minster of Health, Disease prevention and control directorate has prepared four years' National cancer control plan in 2015. The aims of this control plan are to reduce the mortality rate from cancer and to ensure better quality of life for those living with the disease.

TASH is currently the oncology referral center of the country although other centers have been established recently, they are not fully yet functional. Most oncologic patients present to the emergency department of TASH when they faced with emergency conditions. In fact, there is huge burden of oncology cases in the ED of TASH. I have observed substantial number of patients have frequent visits. Most patients who are referred to our hospital have an advanced disease that is disseminated disease at presentation. This is because of poor health seeking behavior and delayed referral from local health facility. So when these patients come to our department, the disease is already beyond surgical intervention and requires referral to oncology

department. These patients also don't have tissue diagnosis on presentation to ER which makes referring these patients to oncology center difficult.

Most patient come to ED directly from their home as there is no 24/7 working oncology center. These patients are also transferred from different outpatient clinic and oncology center for different reason like oxygen therapy, transfusion, feeding gastrotomy, sepsis management and palliative care. So once these patients are admitted to ED they stay for a long time because of different factors some of the reason being unwillingness from other department to admit those patients, failure to be admitted to other department due to scarcity of bed both at ward and oncology center. Complications arising from long stay in emergency like hospital acquired infection and lack of palliative care in the country also make these patient difficult to discharge them.

The first step of the solution would be assessing the magnitude of the problem. I cannot get any comprehensive publications on such issues except some registry from oncology follow up center, it was not quite enough to show the full and detail picture of the problem and my study will try to address this problem by identifying the epidemiology like sociodemographic factors, types of cancer, performance status of oncologic patients visiting the TASH ED as well as death and associated factors like cause of death. It can be an input for further intervention on all prevention measures especially secondary and tertiary preventions by the stakeholders.

1.3 SIGNIFICANCE OF STUDY

Oncologic emergency is a one of important issue in Africa particularly Ethiopia where there is resource limitation at large and appreciation of its local pattern can help inform policies on its early prevention and management. There is no literature done on this area in our country.

This research is going to be helpful in understanding the clinical profile of oncologic emergency patients at the emergency department, magnitude of the problem and outcome of patients with oncologic emergency in our context by filling the knowledge gap on the area. Moreover, it will be one of the complements forwarded in solving problems regarding practices of management of oncologic emergency as it is going to have important implication regarding health promotion for better life and making adequate preparation in terms of knowledge and resource

This research aimed to show burden of treating oncologic patients in ED, so that it is important to develop local protocol and algorithm for emergency.

2. LITERATURE REVIEW

2.1 Epidemiology of oncology

According to GLOBOCAN 2012 estimation, about 14.1 million new cancer cases and 8.2 million deaths occurred in 2012 worldwide. As figures constantly shows incidence of cancer is increasing and for instance, the 2008 GLOBOCAN estimated new cancer cases were12.7 million and 7.6 million cancer deaths worldwide(2).And according to WHO 2015 report globally 8.8 million deaths are due to cancer, which is nearly 1 in 6 deaths is due to cancer. And approximately 70% of deaths from cancer occurs in low and middle income countries(8)

In Ethiopia, even though I could not find any nationwide figures about the incidence of cancer there are some hospital based registry publications and estimations from this figures. Likewise, according to Solomon et al publication,the 2015 Ethiopia estimated incident of cancer cases is 21,563 (95% CI) and 42,722 (95% CI) in men and women, respectively, with a male-to-female ratio of approximately 1:2. The most common cancer in men age ≥ 15 years was colorectal cancer, followed by non-Hodgkin lymphoma, prostate cancer, leukemia, and lung cancer. In females 15 years and older, the most common cancer was breast cancer, followed by cervical cancer (CC), ovarian cancer, CRC, and leukemia(13) and in other retrospective study based on hospital registry in Tikur Anbessa Specialized Hospital, Oncology Center by Wodemagegnhu and his colleagues show similar female predominance (72.8%). Among all patients, only 10% of patients did come to the center in early stage I and II. The most common malignancy in female was gynecological malignancy 47% followed by breast carcinoma 26%. Ca uterine cervix found the most common malignancies among all gynecological malignancies. Head and Neck malignancy is found to be the leading malignancy in male 22% followed by sarcoma 15%, Gastrointestinal 12%, Hematology malignancies and urogenital 9% each and Thyroid 5%(13)

Oncologic patients as it is well known, they will visit emergency rooms for different reasons. Besides the similar compliant with the general population, they additionally complain cancer related complications and treatment related complication. An early and accurate identify these complaints have significant outcome. And the development of new treatment options has led to an increase in their life-span and frequency of emergency department visits(10).

ED is one of the most important places for rapidly addressing the complaints of these patients. Most of these patients visit ED at least once over the course of their disease(9,10).Accurate diagnosis and proper treatment of these patients in ED can dramatically enhance their quality of life and decrease their mortality rate

2.1 Sociodemographic characteristics of Oncologic Patients in ED

In Shohadaye Tajrish Hospital, Tehran, Iran, during one year from April 2014 to March 2015, 568 patients visited ED with the mean age of 53.64 ± 18.99 years (2–94) and 56.5% were male. 500 (88%) patients experienced their first visit and 367 (64.7%) were presented in the night shift. 372 (65.5%) patients arrived at the ED in a private car. The most common location of tumor was brain (32.7%) and gastrointestinal (27.1%). 247 (43.5%) of the tumors were metastatic(14)

In other retrospective electronic medical record review at Asan Medical Center ED for 12 months, 5,502 patients were managed in this area. The mean age was 57.4 years (range 17–89), and 55.8 % of the patients were men; 88.8 % of underlying malignancies were solid tumors, and 11.2 % had hematologic malignancies. Lung (20 %), stomach (17.5 %), colorectal (12.9 %), and breast cancers (10.5 %) were the most prevalent in terms of emergency visits among solid tumors, as lymphoma (5.7 %) and multiple myeloma (3.2 %) among hematologic malignancies. Of the 5,022 patients, 90.8 % were under active treatment with chemotherapeutic agents; among them, 53.9 % received anticancer treatment within 1 month (37.2 % within 15 days and 16.7 % between 15 and 30 days), and 12.0 % had treatments between 1 and 2 months. In 24.8 % of the patients, more than 2 months have passed since they had the last treatment, and 4.8 % were under radiation therapy. Patients who were receiving supportive care without treatment were 6.2 %.(15)

In other single center, experience by Ozgur and his colleagues, which was conducted at an ED, associated with an education hospital in Mugla province of southwest Turkey? They found out that out of 102 patients, 18% (n=18) made one visit, 44% (n=44) made two, 19% (n=19) made three, 11% (n=11) made four, and 8% (n=8) made five or more. In this study group, the most common site of primary tumor were the lung (n=31, 30%), colon-rectum (n=17, 17%), and breast (n=16, 17%).(16)

2.3 Oncologic Emergencies

In other retrospective electronic medical record review at Asan Medical Center ED for 12 months the cases seen at the ED were disease progression (55.5 %), infection (22.8 %), treatment-related complications (14.7 %), and non-cancer-related problems (7 %). Bowel obstruction (10.9 %) caused by peritoneal carcinomatosis, cancer invasion, or paralytic ileus was the most common diagnosis related to disease progression, and effusions (9.3 %) including peritoneal, pleural and pericardial space, and cancer pain (7.7 %) followed. Central nervous system metastases (7.0 %) including the brain parenchyma, spinal cord, and leptomeningeal seeding were also common diagnosis. Pulmonary system (10.7 %) was the most common site for

infections, and biliary tract (2.0 %) followed. Although rare, catheter-related infection was an important problem for those with port implanted in the subcutaneous space. Febrile neutropenia (8.0 %) was the most frequent treatment-related problems, and oral mucositis, chemotherapy induced colitis, and radiation pneumonitis were all unique problems associated with cancer treatments(15). According to other study which was undergone in 2017 in US, cancer-related ED visits most commonly were breast (14.9%), prostate (11.3%), lung (10.3%), and multiple cancers(10.2%).(17).Another large studies have shown that neutropenic fever as one of commonest oncologic complication and causes death in 4-30% of the patients(19)

2.4 Emergency treatment of oncologic patients

In other retrospective electronic medical record review at Asan Medical Center ED for 12 months, patients received more than one treatment. Parenteral antibiotics administration (28.9 %) and pain control (22.9 %) with opioid were the most common treatments. Tapping for effusions, stent insertion for obstructed bowel, drainage for biliary or urinary tract obstructions, repositioning of previously existing catheters, etc. were the treatments classified as drainage procedures (17.5 %). Supportive care with parenteral hydration and nutritional supply (10.7 %) and colony-stimulating factor administration for neutropenia (8.3 %) were also common. Whole-brain radiotherapy or gamma-knife radiosurgery depending on the extent of metastases, palliative radiotherapy for metastatic bone pain or spinal cord compression, etc. were classified as radiotherapy (6.4 %). Anticoagulation for newly diagnosed venous thromboembolism and vascular interventions including inferior vena caval filter or superior vena caval stent were rare but important treatments and classified as other treatments. The difference in the main treatments according to main diagnoses was analyzed. In patients with infection, parenteral antibiotics were given in 92.8 and 46.5 % of the treatment-related problems received parenteral antibiotics. Pain control was done in 37.1 % of disease progression, compared with 8.8 % of the no cancer-related problems. Supportive care was only provided most commonly to patients with disease progression (16.2 %); however, 1.5 % of infection and 6.7 % of the treatment-related problems received such treatment(15)

2.5 Disposition of oncologic patients and death associated factors in ED

In Shohadaye Tajrish Hospital, Tehran, Iran, during one year from April 2014 to March 2015 the overall mortality rate was 154 (27.1%), 25 (16.2%) of them in ED. They found out that variables; marital status (p = 0.009), visiting on a week day (p = 0.044), arrival to ED

via ambulance (p<0.001), type of cancer (p = 0.048), stage of cancer (p<0.001), presence of metastasis (p<0.001),being under treatment with chemoradiotheraphy (p<0.001),chief complaint on arrival (p <0.001), tumor location (p=0.04), and hospitalization in ICU (p <0.001) correlated with in hospital mortality(14)

In other single center, experience by Ozgur and his colleagues,53% (n=54) were discharged, 8% (n=8) died in the ED, 26% (n=28) hospitalization. They found that ED Visits are correlated significantly with tumor location (r=0.697; p=0.029), worst performance status (r=0613; p=0.038), metastases to lung from solid tumors (r=0.625; p=0.034), presence of pleural effusion (r=0643; p=0.031), chemotherapy-related anemia (r=0.567, p=0.043), comorbidities (r=0.604, p=0.038), and presence of pain (r=0513; p=0.044) patients(16)

In a descriptive analysis of visits occurring of those EDs in North Carolina (NC) during 2008, using data from the NC Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT), 37,760 had a diagnosis of cancer. Of the cancer-related ED visits, 283 resulted in death. Of the cancer patients who died, 201 (71%) died on their first visit, 52 (18.4%) died on their second visit, 17 (6.0%) on their third visit, and 13 (4.6%) on their fourth, fifth, or sixth visit. Males accounted for 177 (62.5%) of cancer-related ED deaths and the average age at death was 66 (SD14.3) years(20)

In other retrospective electronic medical record review at Asan Medical Center ED for 12 months Of the 5,502 patients visited, 42% were admitted to the inpatient unit, 52.7% were discharged for outpatient follow-up, and 0.2% died during the stay in the CER. Home service was supplied to 0.6 % patients for palliative cares including home nutritional support, catheter care, parenteral opioid administration, etc., and 4.5% of the patients were transferred to other hospitals including hospice care center. Regarding the disposition of patients, the largest proportion of patients with infection (64.3 %) were admitted to the inpatient unit, compared with a relatively small portion of treatment-related problems (26.4 %) (P<0.05). Although statistically not significant, half of the patients with disease progression were discharged for outpatient follow-up, while 7.7 % were transferred to other hospitals including hospice care center. Death during stay in the CER took place in 10 patients, whose main diagnosis was all disease progression. Majority of the patients with non-cancer-related problems (89.9 %) and treatment-related problems (73.1 %) were discharged (P<0.05)(15)

In other study by Birdal and his colleagues at similar center out of 64 oncology patients who applied the ED within one month before their death, 28% made one visit, 42% made two, 14% made three, 10% made four, and 6% made five or more. And on their Immediate outcome 38% were dıscharge, 9 % were dead in the emergency service and 53 % were hospitalized. Visits to ED within one month before death correlated significantly with tumor location (r=0.697; p= 0.029), good PS (r=0613; p=0.038), metastases to lung from solid tumors

(r=0.625; p=0.034), presence of pleural effusion ((r=0643; p=0.031), and presence of pain (r=0513; p=0.044)(4)

3. OBJECTIVES

3.1 GENERAL OBJECTIVE

- To assess the clinical profile of oncologic patients presenting to adult emergency department of Tikur Anbessa specialized hospital from February 2020 – June 2020 G.C.

3.2 SPECIFIC OBJECTIVES

- To describe the sociodemographic characteristics of oncologic patient in ED.
- To determine the most common oncologic complication in ED.
- To assess length of ED stay and reason for the stay.
- To describe which malignancy is common in ED.
- To determine the outcome of oncology patients in the ED and death associated factors.

4. METHODOLOGY

4.1 STUDY SETTING

The study took place in Tikur Anbessa Specialized Hospital (TASH) located in Addis Ababa, capital city of Ethiopia, which is the one of the biggest specialized hospital in the country. Currently it is the only fully functional oncology center in the country which gives service for about 100 million people. Emergency department of TASH is one of few emergency centers in Africa which is established in August 2009 and was transformed into Emergency Medicine department on October 2010. It is used to be the only emergency center in the country but now there are two additional emergency centers in the country. TASH has emergency and critical care medicine specialty program, which started ten years back. Currently the ED is giving service as independent department. The ED is staffed with residents, nurses, seniors and guest instructors. It's currently building its own G+7 floor building.

4.2 STUDY DESIGN AND PERIOD

This study was a prospective institution-based, cross sectional descriptive study at the emergency unit, TASH, Addis Ababa, Ethiopia. It was carried out from February 2020 – June 2020 G.C. All adult cancer patients, presented to the ED with a medical complaint were enrolled in the study.

4.3 SOURCE POPULATION

The source population was all patients attending the adult Emergency Department of TASH during the study period.

4.4 STUDY POPULATION

All confirmed oncologic patients who seek emergency care in TASH adult ED from February 2020 – June 2020 G.C

4.5 METHOD OF DATA COLLECTION

Data was collected 24 continuous hours for total of 5 months. The principal investigator took the role of training interns on data collection, collecting data especially during weekends and checking completeness of data. The training focused on how to fill the questionnaire. Piloting of the questionnaire was done on 10 patients, one week prior to the actual data collection. After piloting method misunderstanding on some terminologies by data collector was identified after which the decision was made to make periodical check on the data completeness and validity The tools included the card number, the time and date of admission to ED, socio-demographic variables, transportation, number of emergency visits after diagnosed with malignancy, current chief compliant, emergency stay time (Days), diagnosis at emergency admission, type, stage, & metastasis of cancer, Location of metastasis, treatment: Performance status, co-morbidities, ED outcome.

4.6 SAMPLE SIZE

All oncology patients who visited emergency department from February 2020 to June 2020 G.C who meet the inclusion criteria were included.

Non-random sampling technique, consecutive sampling technique was used.

4.7 INCLUSION AND EXCLUSION CRITERIA

4.7.1 Inclusion criteria

All oncologic patients whether the diagnosis is new or known admitted to the ED in the six months' study period and willing to give consent to be enrolled in the research.

4.7.2 Exclusion criteria

Oncologic patients who present to ED with complaint other than their illness (e.g. trauma, poisoning)

4.8 DATA COLLECTION

This prospective study was carried out on statistical data from Tikur-Anbessa specialized hospital registry book and by face-to-face interview using a structure questionnaire. Training on how to collect the data was given to interns who were assigned to TASH ED.

Data was collected by PI and data collector and collected data was stored. Appropriate explanation was given on definition of some terms, purpose and importance of the research.

4.9 METHODS OF STATISTICAL ANALYSIS

The data was checked for completeness and inconsistency, and then it was processed and analyzed using SPSS software version 25. Descriptive statistics (percentage, mean, standard deviation [SD], and median) were used to describe the patient characteristics. Additionally, the relationships between clinical and demographic variables (such as age, sex, tumour location, stage of cancer, performance status by Eastern Cooperative Oncology Group-ECOG,co-morbidities, localization of metastatic lesions, oncologic emergencies,) and ED outcome were determined using bivariate and multivariate logistic regression. The dependent variable for the multivariate logistic regression analysis was of ED outcome. P-value<0.05 was considered significant.

4.10 DATA QUALITY AND ASSURANCE

As the data was collected by using pretested structured tools by the PI and the data collector, completeness and validity was checked meanwhile, by the principal investigator. The data quality control measures to be taken include: pre-testing of data collection tools, and checking completeness and internal consistencies of data.

4.11 VARIABLES

Table 1: *Variables of the study of the epidemiology and death related factors of oncology patients in the Emergency department of TASH addis ababa, Ethiopa, june 2020*

Independent variables	Dependent variable
Sex Age (year) Marital status job Time of arrival Day of arrival Living area Transportation to ED Number of ED visits ED chief complaints Source of referral Length and reason for ED stay Reason for ED admission Type of cancer Stage of cancer Tumour location Metastasis Location of metastasis Previous treatment ECOG status	Outcome(Discharge , Death, Hospitalization)

➢

4.12 OPERATIONAL DEFINITION

ADULT- refers to patients above the age of 12, which is a cut of age for patients to be seen in adult ED at TASH.

4.13 ETHICAL CONSIDERATIONS

This research is not contrary the ethical principal of the 1975" Declaration of Helsinki," an all the subjects under the study was informed participants.

A written legal permission regarding the study was obtained by submitting proposal to department of Emergency medicine of Tikur anbessa specialized hospital.

4.14 DISSEMINATION OF RESULT

The paper will be submitted to Addis Ababa University, Faculty of Medicine, department of emergency medicine and critical care, and Oncology department. The thesis will be submitted in different national and international journals for publication. It will be submitted in different conferences and symposiums for discussions and appraisal.

CHAPTER 5

RESULT

1. Socio-demographic data

In this study out of 306 patients who visited emergency department in the study period, 120(39.8%) were male and 186(60.2%) were female. Mean age of the patient is 41.8±16.1. While the maximum and minimum age of patient visiting ED is 85 and 13 respectively.

Most of the patients were from nearby hospitals, mainly Addis Ababa (38.9%) and Oromia (36.6) region.

Table 2 Socio demographic characteristics of patients with cancer in ED of TASH, Addis Ababa, Ethiopia,June 2020

Sociodemographic variable	Sub-variable	Frequency	Percent
Sex	**Male**	120	39.8
	Female	186	60.2
	Total	306	100
Age	**<21**	35	11.4
	21-30	57	18.6
	31-40	73	23.9
	41-50	50	16.3
	51-60	52	17.0
	61-70	32	10.5
	>70	7	2.3
	Total	306	100
Region	**Addis Ababa**	119	38.9
	Oromia	112	36.6
	SNNPR	27	8.8
	Amhara	42	13.7
	Others	6	2
	Total	360	100

198 of the participants are married; 58 of them single, 35 are widowed and 15 of them are divorced; representing, 64.7%, 19%, 11.4% and 4.9% respectively. Furthermore, 33% of the samples were farmers, 18%were government employee, 24.8% were merchants and 15% were students. 22.5% (69) of the sample were illiterate; while 26.1% (80) subjects completed primary school,35.6%(109)completed secondary school and the remaining were diploma and above.

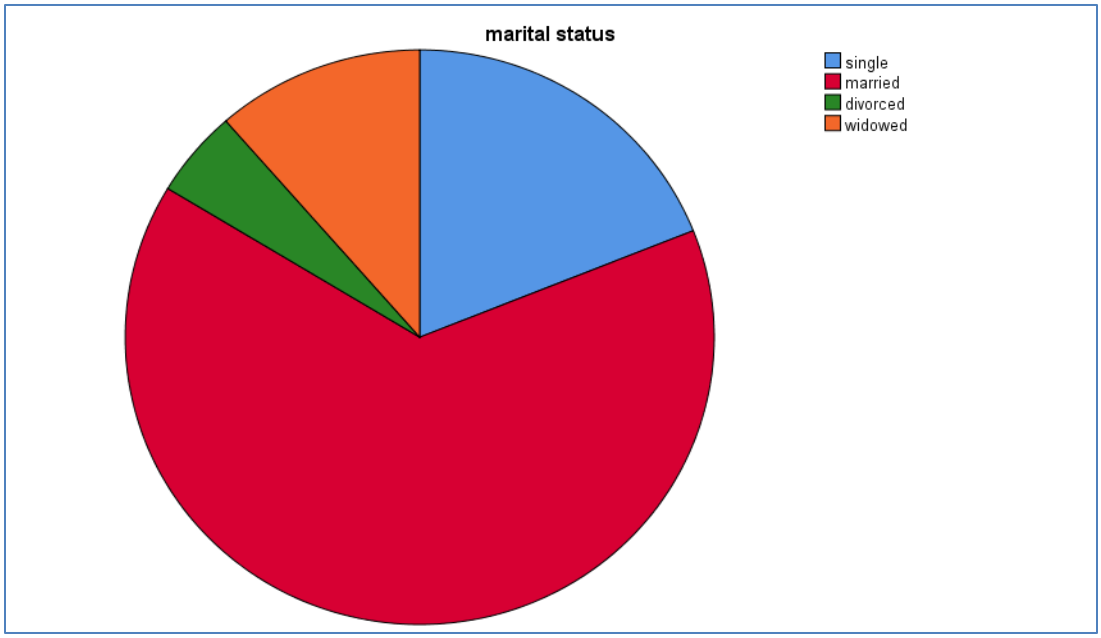


Figure 1: Marital Status among oncologic patients in TASH ED, Addis Ababa, Ethiopia, June, 2020.

2. Emergency room visit

Most of them were initially evaluated in outpatient clinics of TASH (32.6%) which were referred to ED for transfusion, infection management, stenting and other reasons. Time of arrival to ED were recorded and 203(66.3%) arrived during day time and remaining were during night time.

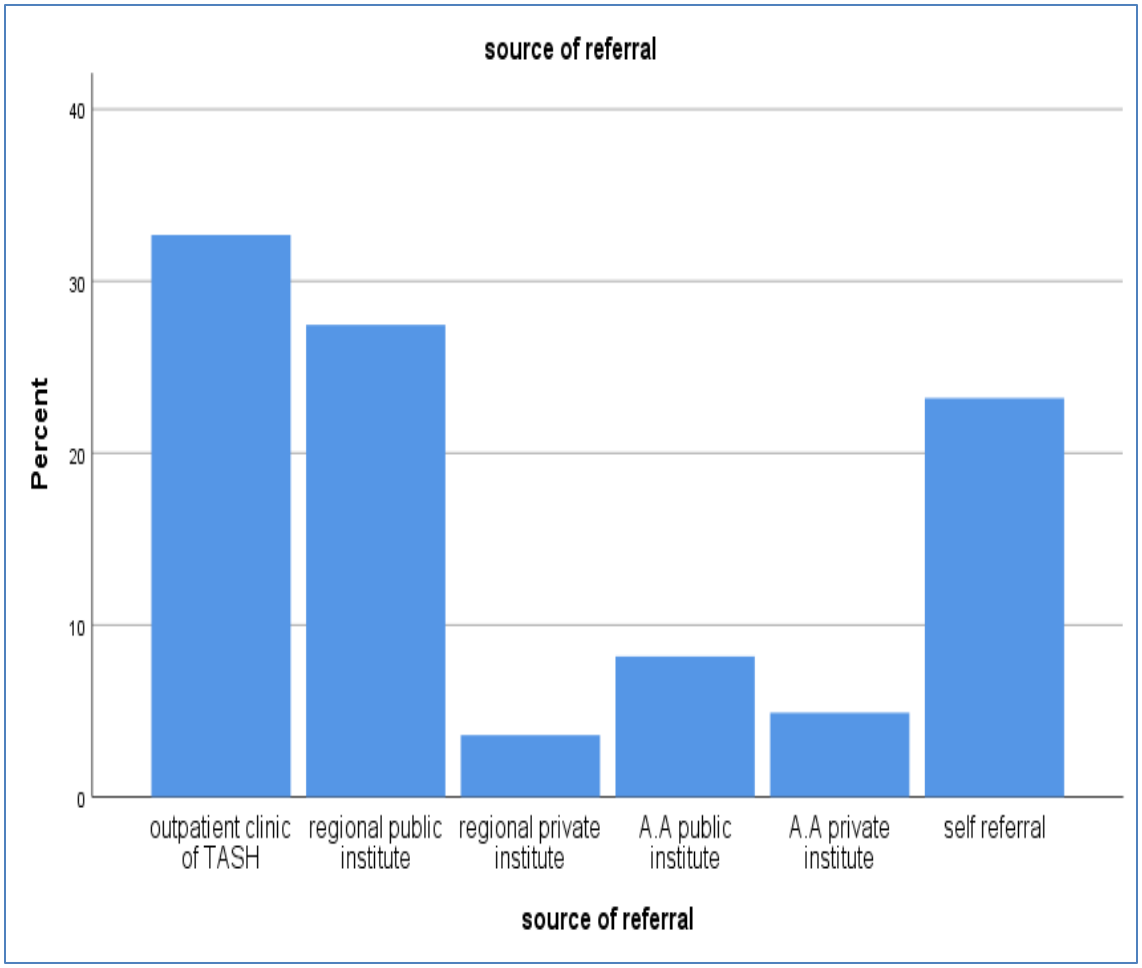
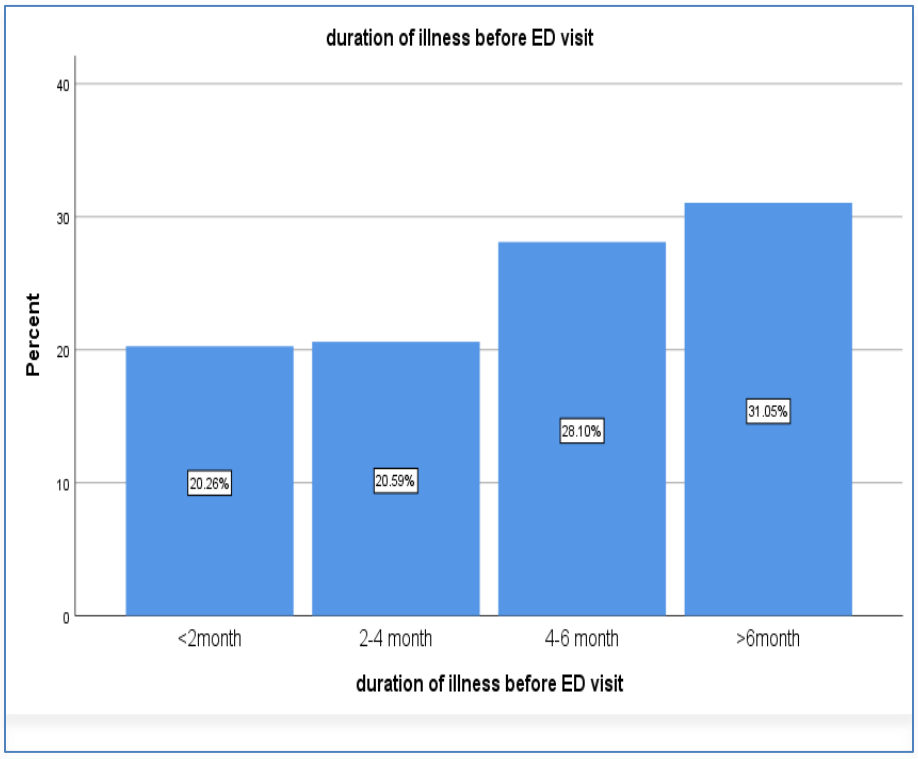


Figure 2-origin of referral oncologic patient, clinical profile of oncologic patients in ED of TASH, Addis Ababa Ethiopia, June 2020.

3. Clinical profile

Most of the patients (31%) visited ED after 6 months of onset of illness while 28.1% sought health care within 4-6 months (Figure 3).The mean number of ED visit within a year is 1.9±1.11 while the maximum number of ED visit is 6.

Figure 3-duration of illness, clinical profile of oncologic patient in ED of TASH, Addis Ababa Ethiopia, June 2020



The main complaint of admitted oncologic patients to ED is mostly respiratory (20.6%) followed by easy fatigability (15.7%) and mentation change (11.8%). Table 3

Table 3-Chief complaint, clinical profile of oncologic patient in ED of TASH, Addis Ababa Ethiopia, June 2020

ED chief complaint	frequencies	Percentage
Fever	22	7.2
Mentation change	36	11.8
Easy fatigability	48	15.7
Respiratory complaint	63	20.6
GI complaint	39	12.7
Pain	8	2.6
Body weakness	12	3.9

Bleeding, ulcer	15	4.9
Body swelling	17	5.6
Difficulty of swallowing	22	7.2
Decreased urine output	15	4.9
Other	9	2.9

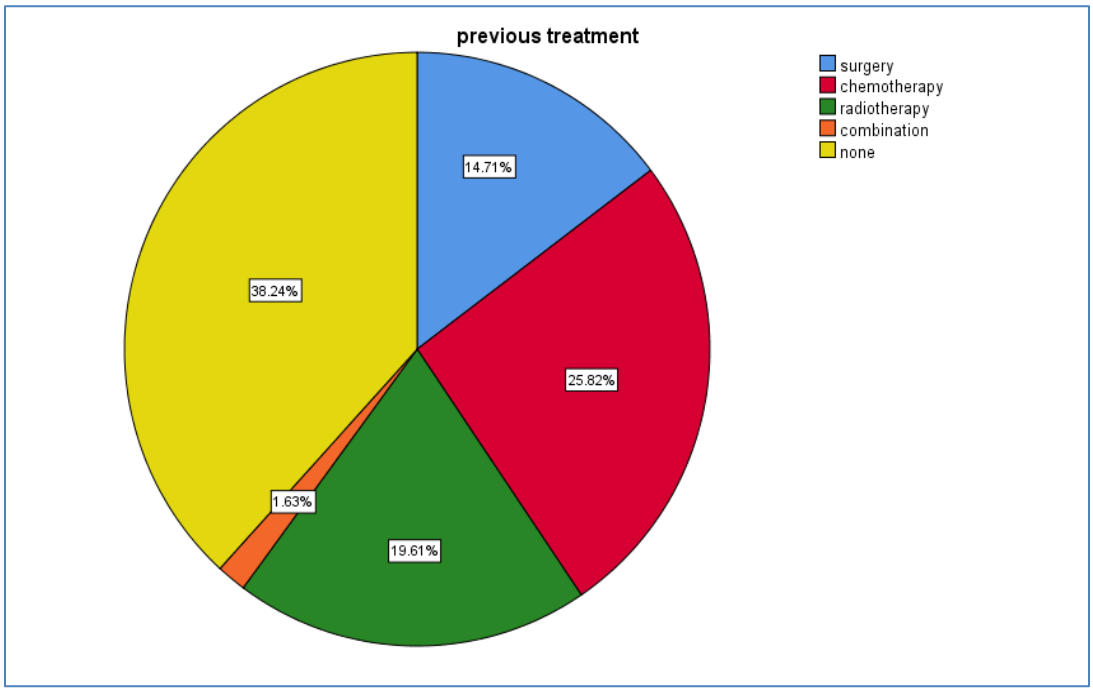
The most common identified malignancy in ED is hematology malignancy (35%) followed by cervical and GI pathologies in 14.4%and 11.4% respectively. Table 4

Table 4-Primary tumour location, clinical profile of oncologic patients in ED of TASH, Addis Ababa Ethiopia, June, 2020

Primary tumor location	Frequencies	Percentage
Hematology	107	35
Lung and pleura	24	7.8
Breast	31	10.1
Cervical	44	14.4
Esophagus	23	7.5
Brain	11	3.6
Prostate	4	1.3
GI	35	11.4
GU	4	1.3
Skin	2	0.7
Endocrine	7	2.3
Bone ,muscle	2	0.7
Neck	12	3.9

About 57.8% of patient has locally advanced cancer on first presentation while 42.2 % of patient has distant metastases. Most of metastases are to the urinary system in about 11.1 % which is followed by lung and pleura and liver and pleura. Out of 306 patients who visited ED 61.8% took treatment previously (chemotherapy, radiotherapy, surgery or combination) before presentation to ED.

Figure 4: previous treatment Status among oncologic patients in TASH ,ED, Addis Ababa, Ethiopia, June, 2020.



Commonest oncologic complication was febrile neutropenia and infection, the remaining are summarized in Table 5 below

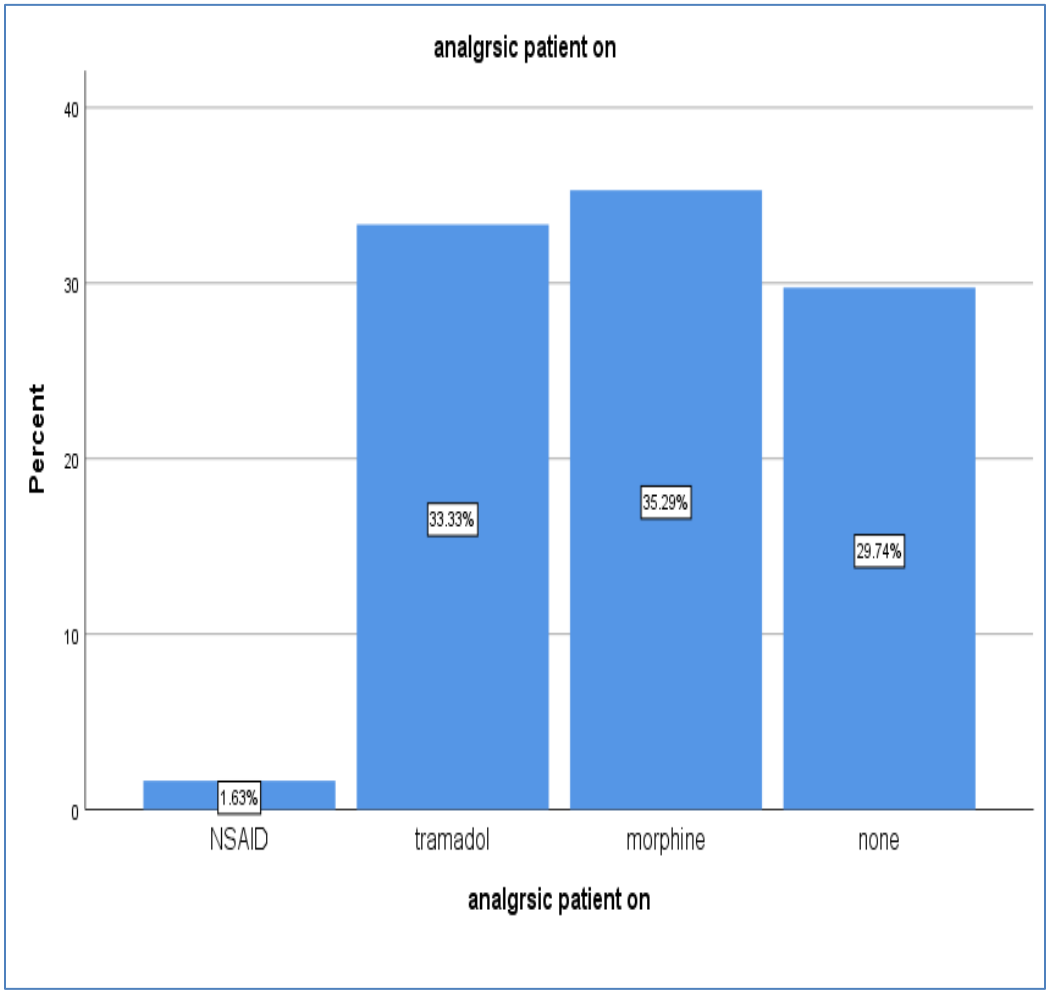
Table 5 oncologic complication (reason for ED visit), clinical profile of oncologic patients in ED of TASH, Addis Ababa Ethiopia June 2020

Oncologic complication/ reason for ED visit /	Frequency	Percentage
Upper airway obstruction	21	6.9
TLS	10	3.3
Febrile neutropenia and infection	49	16
Electrolyte abnormality	23	7.5
Malignant spinal cord compression and pathological fracture	7	2.3
Pericardial effusion and temponade	5	1.6
VTE	22	7.2
Hyper leukocytosis	24	7.8
Malignant pleural effusion	18	5.9
Urinary tract obstruction	29	9.5
Bleeding	11	3.6
Increased ICP and seizure	7	2.3
Nausea and vomiting	48	15.7
Anemia	26	8.5
Other	6	2
Total	306	100

During the study period ECOG 1 was noted in 99 (33%), ECOG 2 in 68 (25.2%), ECOG 3 in 85 (27%) and ECOG 4 in 43 (14%)

Around 1/3rd of patients are not on any form of analgesics. Out of 306 patients 215(70.3%) were on analgesics. Figure 5

Figure 5-Analgesic taken by the patient, clinical profile of oncologic patients in ED of TASH, Addis Ababa Ethiopia, June 2020



4. ED Disposition

Mean length of ED stay is 3.16 ±1.86 days. The longest ED stay is 13 days. Only 14.7% of patients stayed less than 24hr in ED. The reasons for >24hrs ED stay is lack of bed at ward in 29.1% while 31.4% due to patient doesn't deserve admission, which are palliative

patients or came just for transfusion, and 24.5% had unsettled diagnosis. Of these patients only 42.2% were admitted to ward while the majority were either discharged (39.5%) or died (15%). 3.3% were transferred to other hospital or left hospital AMA.Figure-6

Figure 6-outcome of oncologic patient in ED, clinical profile of oncologic patients in ED of TASH, Addis Ababa Ethiopia, June, 2020

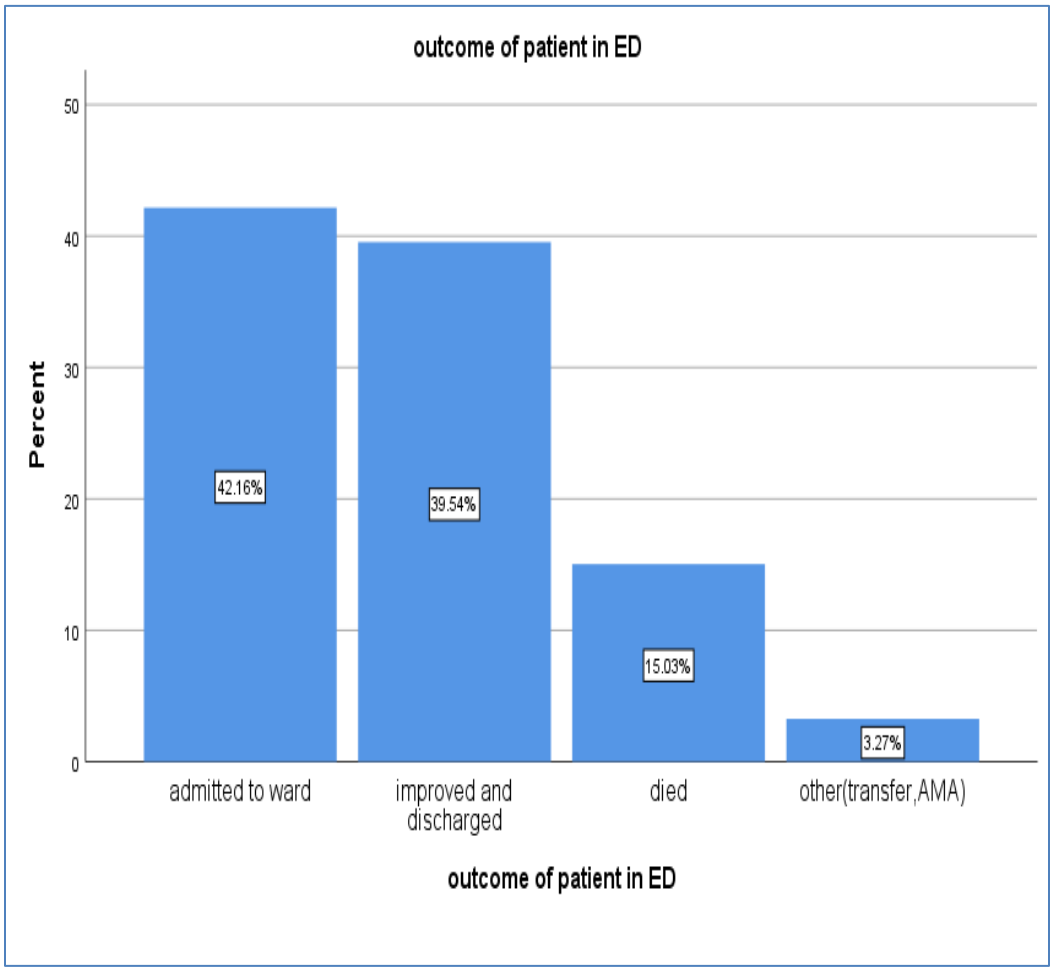


Table 6 bivariate and multivariate analysis of factors associated with death of cancer patients in ED of TASH, Addis Ababa Ethiopia, June, 2020

Variables	Outcome		COR (95%, CI)	AOR [95%, CI]	sig
	Dead	Survived			
Time of arrival					
Day	18	185	1	1	
Night	28	75	3.837(2,3.07)	4.9(1.3,25)	**<0.001**
Transport to ED					
Ambulance			4.2(2.1,8.2)	3.1(1.4,6.9)	**<0.001**
Other			1	1	
Primary tumour location					
haematology	7	100	1	1	
Lung and pleura	7	17	5.8(1.8,18.8)	0.6(1.4,33)	**0.003**
Breast	9	22	5.8(1.96,17.3)	1.6(4,660)	**0.002**
Cervical	3	41	1.04(0.25,4.2)	0.5(0.1,3)	0.9
Oesophagus	1	22	0.65(0.7,5.5)	0.0(0,0)	0.6
Brain	4	7	8.1(2,34)	0.6(0.2,200)	0.04
Prostate	0	4	0.00(0,0)	0.0(0,0)	0.9
GI	7	28	3.5(1.1,11.3)	1.3(0.5,21)	0.027
GU	1	3	4.7(0.4,51)	19(1.4,8177)	0.2
Skin	0	2	0.00(0,0)	0.0(0,0)	0.9
Endocrine	3	4	10(2,57)	2.2(0.9,279)	0.06
Bone ,muscle	0	2	0.00(0,0)	0.00(0,0)	0.9
Neck	4	8	7.2(1.7,29)	14(1.9,199)	**0.007**
Source of referral					
Outpatient clinics of TASH	5	95	1	1	
Regional Public institute	10	74	2.5(0.8,7.8)	2.4(0.7,8)	0.9
Regional private institute	1	10	2(0.2,18)	1.7(1.6,18)	0.57
Addis Ababa public institute	4	21	3.6(0.8,14)	2.4(0.5,11)	0.07
Addis Ababa private institute	3	12	4.7(1.6,22)	8(1.5,49)	0.5
Self-referral	23	48	9.2(3.2,25)	7.7(2,24)	**<0.001**
Comorbidity					
Retroviral infection	7	33	1.5(0.6,3)	1.2(0.7,3)	0.36
DM	10	17	4.6(1.2,9)	5.3(2,13)	**0.01**
HTN	0	23	0.00	0.00	0.9
Asthma	0	10	0.00	0.00	0.9
Cardiac illness	5	10	3.6(1.1,11)	2.5(0.7,8)	0.02
None	23	167	1	1	
ECOG					
Good ECOG(ECOG<=2)	9	167	1	1	
Poor ECOG(ECOG(3-5))	37	93	7.3(3.4,15)	5.6(2.5,12)	**<0.001**

P value of <0.05 was considered statistically significant.

CHAPTER 6
DISCUSSION

Cancer is a chronic disease, acute complaints such as pain, shortness of breath, fever, nausea, and vomiting bleeding; mentation change may prompt ED admission. An ED is probably one of the most important places for life threatening emergencies and unexpected side effects associated with cancer or treatment. Emergency department admissions of cancer patients present a challenge not only to the oncologists, but to the emergency physicians as well. Actually, such admissions are unexpected since cancer patients are usually expected to be admitted to the oncology ward because of some sort of medical problems. However, these patients are admitted to the emergency department due to various medical conditions such as disease-related signs and symptoms and treatment-related complications. The emergency department admissions should be recognized as acutely-developing and potentially life threatening events (21) that, if not anticipated, promptly recognized and effectively managed, might result in significant morbidity and even death(22,23).

1. Socio demographics

In this study, 120 (39.8%) of 306 cancer patients who were admitted to emergency room were males and 186(60.2%) of them were females and the mean age was 41.8±16.This is comparable to previous studies conducted by woldu et al(24) involving 142 patients. Fifty five (38.7%) of the patients were males and 87 (61.3%) were females, and the mean age was reported to be 42.27 ± 16.75. In another study conducted by tanriverdi et al(16), they reported that the mean age of the patients admitted to emergency room was 62 and 65% of the patients were males. Most of the patients were from Addis Ababa (38.9%, n=119) and Oromia region (36.6%, n=112). This could be better explained by urbanization in case of Addis Ababa, and with respect of the Oromia region population size and its location near to the TASH could be the factor

2. Emergency room visit

In our study average number of ER visit was 1.9±1.11 (range 1-6) which is nearly similar to our study done for 6 month by sadik et.al(13)which shows average number of ER visits was 2.08.Repeated visits may be due to disease progression or because ED service is often more accessible than outpatient service.

When we evaluated length of ED stay; length of stay of oncology patients in the Emergency Department is 2 hours a report in Germany, Australia and Switzerland (25)(26,27) When we compare with Australia the range was from minutes to an hour (57 minutes to 40 hours) median 6.8 hours (28). In Taiwan oncology patient length of stay in the Emergency Department is shorter than the tikur anbesssa specialized hospital emergency department, 2.91 hours (26). According to the above study, other countries have a very short length of stay of oncology patients when compared with our study which accounts for the majority one to thirteen days with mean stay of 3.16±1.86. This could be due to reasons like unsettled diagnosis and

there were patients who was kept at ED for palliation purpose and another one is for 2 weeks at beginning of pandemic (covid 19) it was mandatory to have covid test for some of patients for admission. According to studies of ann.et al(29) the times of presentation for ED visits were 44.3% during the day,39.1% during the evening, and 16.6% during the night which is somewhat similar to our studies result.

3. Clinical profile

In a study by Yücel et al(30) involving 336 patients, pain was the most common admission complaint with 107 (23%) patients but in this study the main complaint of admitted oncologic patients to ED is mostly respiratory (20.6%) followed by easy fatigability (15.7%) and mentation change, this is due to in our study patients with certain oncologic complication like UAWO,TLS and pleural effusion and secondary metastasis in lung and pleura present with respiratory complaint in addition to primary cancer in lung. This is consistent with study done by vandyk as well as sadik(13,31). Swenson et al. and Yücel et al(29)(30) reported that the most common cancer type in oncological admissions was lung cancer in their study and sadik et al(13) study also shows lung cancer as most common one (32%). In contrast with other studies the most common cause of oncologic admission to ED in our study was hematology malignancy (35%) followed by cervical and GI pathologies in 14.4%and 11.4%. In this finding predominance of hematology cases could be because of the scarcity of subspecialists in other Ethiopian hospitals and most of these patients are admitted only through the emergency department for inpatient management. Some other malignancies can be managed by other subspecialties (other than oncologist), like by surgeons.

In our study most of the patients visited ED after 6 months of onset of illness (31%) while 28.1% sought health care within 4-6 months and about 57.8% of patient has locally advanced cancer on first presentation while 42.2 % of patient has distant metastases. This is nearly similar to study done by Yucel et al and Swanson et al(30)(29)which shows the majority of patients are in later cancer stages upon admission. These data indicate that diagnosis of cancer in an early stage is difficult in our study. This possibly explained by following reasons: 1st is due to absence of other oncologic center and tiresome health delivery system in Ethiopia which forces the patients with cancer to go through several referrals before they reach the appropriate treatment center.2nd is low socioeconomic status of our population which hinder them from early visit of health institution and lack of awareness about cancer prevalence in country due to poor education status of the patients. Another reason can be long waiting list for oncological consultations in TASH.

In our study, the most common oncologic complication necessitating emergency admission was febrile neutropenia and infection 49(16%) followed by nausea and vomiting and urinary tract obstruction, 15% and 9.5% respectively. Infection, and the associated febrile neutropenia in is a potentially life-threatening complication of cancer treatment and a very common cause of hospitalization (32)(9). Therefore, early identification and management is extremely important. Although patients with febrile neutropenia might appear relatively stable in the emergency department on admission, they subsequently experience clinical deterioration

in a matter of several hours or days. Since delaying the administration of antibiotics could increase the likelihood of death, the empirical administration of broad-spectrum antibiotics could be considered in the emergency department, in agreement with the relevant national or international guidelines. Large studies have shown that neutropenic fever causes death in 4-30% of the patients (19) The present study revealed results similar with previous studies where febrile neutropenia and infection is commonest cause of death 8(17%).

4. Outcome of patient in ED and death associated factors

In our study only 42.2% were admitted to ward while the majority were either discharged (39.5%) or died (15%). 3.3% were transferred to other hospital or left hospital AMA. From death half of patients,23(50%), are those with comorbidity, mainly DM.Statistical analysis shows strong association between presence of comorbidity and death of patient, for example DM shows significant association with p value of 0.01.According to study done by lipsomble et.al 5-year mortality amongst patients with diabetes was 1.39 compared to non-diabetic patients with cancer(33).This possibly can be explained by presence of common risk factors for both like obesity and some cancer therapy like steroid will induce DM.Another explanation is that because DM decrease immunity which further put cancer patients at risk of death from different other diseases

Other factor associated with death are advanced ECOG (P<0.001) Since the ECOG scoring depends mainly on the patient's daily activities; it might prove to be simple and practical in the emergency setting in an attempt to predict the outcome. For cancer patients, poorer ECOG has been shown to be associated with poorer prognosis. Bozdemir et al. reported that poor ECOG is associated with an increased risk of in hospital mortality(34).Similarly, sadik et al. (13) reported that poor ECOG in the emergency department was found highly predictive for short-term mortality. Our results were consistent with previous studies. These findings indicate that ECOG is the main prognostic factor for accurate survival estimations of cancer patients and should alert the emergency physician and the oncologist regarding the short-term survival. out of 46 death in ED those patients which died within 24 of ED stay are only 5,the remaining stayed longer mainly due to unfit patients for admission 15(32.6) followed by unsettled diagnosis 14(30.4) or lack of bed at ward 12(26.1)

From primary tumor location lung, breast and neck associated with death of patient with p value of 0.03,0.002and 0.007 respectively, this is similar to study done in turkey(4) which shows lung cancer association with death(p=0.029).

Another strong association of death of patients was found with self-referral (p<0.001) where 23(50%) of death was from self-referral patients, this indicate poor health seeking behavior of population and they are visiting health care at end of life. There is also association of death with night presentation to ED (p<0.001; OR4.9; 95%CI 1.3,25) and arrival by ambulance(p<0.001; OR3.1;95%CI 1.4,6.9) this is mainly related to severity of disease up on ED arrival. This is consistent with study done in Iran(14).

CHAPTER 7

7.1 CONCLUSION

Based on the results in TASH emergency department Hematology, cervical, Urinary, esophagus, Breast, Lung and GI malignancies are the most common malignancies in our study. The commonest reasons for ED visit were respiratory complaint, difficult of swallowing and easy fatigability while commonest oncologic complication was febrile neutropenia and infection. Most of the patients visited ED after 6 months of onset of illness and the commonest reason for long ED stay was due to keeping patients in ED which doesn't deserve admission to ward. Regarding the treatment outcome of oncologic patients, 46 were died and 260 were either admitted or discharged. The factors correlating with ED mortality included, ED presentation by self-referral, arrival via ambulance and during night, lung, breast and neck location of cancer, having poor ECOG, and having comorbidity (DM)

Further study should be conducted with a larger sample size and probability sampling to further identify other factors associated with the death of the oncologic patients and to better generalize to other centers. The length of stay for emergency patients can be reduced by rapid access to appropriate investigations and adequate ward staff to instigate treatment, to review patients frequently and to facilitate discharge.

7.2 RECOMMENDATION

1. FOR GOVERNMENT OF ETHIOPIA(MOH):
    - Absence of additional oncologic center in the country is main problem for delay in diagnosis of oncologic cases and long waiting lists for treatment which will put the patient at risk of developing complication in mean time therefore better to have other oncologic centers.
    - To optimize emergency care of patients with cancer-related problem it would be better to expand care to other areas including general hospitals.
    - In this study most our patient came late after onset of illness therefore better to increase awareness of the population to seek health care early by different means.
    - Scarcity of palliative care in the country is overburdening ED with patients which come for palliative care.

2. FOR AAU-BLH:
    - In our study most common malignancy patients visiting ED are hematologic who are mostly referred from outpatient clinic for blood transfusion and possible inpatient management. So to decrease ED overburdening it will be better to admit these patients directly to ward and also to prepare separate blood transfusion area.
    - There is also no fully functional of palliative center which makes ED home for patients like malignant effusions, pain, and etc. so it would be better to have functional palliative center at our set up and different center to decrease patient load on ED.
    - Since Emergency department admissions of cancer patients present a challenge to the oncologists and the emergency physicians as well, there must be Close collaboration between the oncology team and the emergency medicine physicians regarding the care of cancer patients for their urgent medical conditions. This necessitates development of a consensus algorithm of management.
3. FOR EMERGENCY AND CRITICAL CARE PHYSICIANS
    - Initial ED assessment of oncologic patients should be prompt, with a focused questioning regarding their main complaint, a baseline evaluation of their vital signs and a rapid overall physical examination in order to pick some complications like febrile neutropenia and infection early.
    - Emergency physicians should be watchful for comorbidities that can be preexisting and exacerbated or directly caused by cancer treatment, potentially complicating the clinical picture during a visit to the ED.
    - Assessment and medical management of both cancer-related complications and chronic diseases are required during a cancer-related ED visit because they may exacerbate presenting symptoms.

7.3 LIMITATION

In this study period only 306 patients were found which was due decreased patient flow because of covid 19 pandemic. Other limitation is this was a small study conducted at a single, urban, academic center, and our findings may not be generalizable to other regions. The external validity of this study is really limited. Firstly, the study done at the TASH which is high level/tertiary hospital in which the cases are more complicated and diseases are at very extreme end. Additionally pediatric patients are not included in study (where type and incidence of oncology is likely different).Another limitation arises due to the sampling. It was a consecutive sampling; which might increase the selection bias, so it is better to use random sampling method. No matter generalizing to other general or primary hospital ED might be premature, the results of this survey, however, are a great input in revising policies and switching the plans of ED constructions where Ethiopia is heading towards more to quality and compassionate care than the mere buildings.

CHAPTER 8: ANEX

ANEX 1: REFERENCE

1. Sudhakar A. History of Cancer, Ancient and Modern Treatment Methods. 2009;1(c).

2. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide : Sources , methods and major patterns in GLOBOCAN 2012.

3. Woldeamanuel YW, Girma B, Teklu AM. Cancer in Ethiopia Cancer in Ethiopia Ethiopia has a population of more than 84 million people and is expected to become the ninth. Lancet Oncol [Internet]. Elsevier Ltd; 2013;14(4):289–90. Available from: http://dx.doi.org/10.1016/S1470-2045(12)70399-6

4. Yildirim B, Tanriverdi O. Evaluation of Cancer Patients Admitted to the Emergency Department within One Month before Death in Turkey : What are the Problems Needing Attention ? 2014;15(August 2011):349–53.

5. Klemencic S, Perkins J, Editor S, Abraham M. Diagnosis and Management of Oncologic Emergencies. 2019;20(March):316–22.

6. Tigeneh W, Molla A, Abreha A. Pattern of Cancer in Tikur Anbessa Specialized Hospital Oncology Center in Ethiopia from. 2015;1–5.

7. Cervantes A, Chirivella I. Oncological emergencies. 2004;15(Supplement 4):299–306.

8. Emergencies AM. Oncological Emergencies.

9. Manzullo EF, Escalante CP. Oncologic Emergencies.

10. Tsai I, Sun C, Chang C, Lee K, Liang C, Hsu C. Characteristics and outcomes of patients with emergency department revisits within 72 hours and subsequent admission to the intensive care unit. Tzu Chi Med J [Internet]. Elsevier Taiwan LLC; 2016;28(4):151–6. Available from: http://dx.doi.org/10.1016/j.tcmj.2016.07.002

11. Stewart, Bernard W, Wild CP. World Cancer Report 2014. Geneva, Switzerland: World Health Organization, International Agency for Research on Cancer, WHO Press, 2015. Adv Nutr. 2016;7(2):418–9.

12. Mcguire S. World Cancer Report 2014 . Geneva , Switzerland : World Health Organization , International Agency for Research on Cancer , WHO Press , 2015. 2015;418–9.

13. Sadik M, Ozlem K, Huseyin M, Aliayberk B, Ahmet S, Ozgur O. Attributes of cancer patients admitted to the emergency department in one year. 2014;5(2):85–90.

14. Mofid B, Novin K, Roointan ES, Forouzanfar MM. Epidemiology and Death-Related Factors of Oncology Pa- tients in Emergency Department. 2016;4(3):145–50.

15. Ahn S, Lee Y, Lim KS, Lee J. Emergency department cancer unit and management of

oncologic emergencies : experience in Asan Medical Center. 2012;2205–10.

16. Tanriverdi O, Beydilli H, Yildirim B, Karagoz U. Single Center Experience on Causes of Cancer Patients Visiting the Emergency Department in Southwest Turkey. 2014;15:687–90.

17. Sm A, Yilma Z, Assefa M, Tigeneh W. Trends of Breast Cancer in Ethiopia. 2016;2–6.

18. Kyriacou DN, Shelburne N. Trends in Adult Cancer–Related Emergency Department Utilization An Analysis of Data From the Nationwide Emergency Department Sample. 2017;20850.

19. Dale DC, Crawford J, Cosler LE, Ph D, Lyman GH, Carolina N. Mortality , Morbidity , and Cost Associated with Febrile Neutropenia in Adult Cancer Patients. 2006;(March):2258–66.

20. Yates M, Barrett A. Oncological Emergency Admissions to the Norfolk and Norwich University Hospital : An Audit of Current Arrangements and Patient Satisfaction. Clin Oncol [Internet]. Elsevier Ltd; 2009;21(3):226–33. Available from: http://dx.doi.org/10.1016/j.clon.2008.12.006

21. Baruah M. Oncologic emergencies : a review. 2018;6(5):1484–90.

22. Diagnosis and Management of Oncologic Emergencies.

23. Lewis MA, Hendrickson AW, Moynihan TJ. Oncologic Emergencies : Pathophysiology , Presentation , Diagnosis , and Treatment. 2011;61(5):287–314.

24. Woldu MA, Legese DA, Abamecha FE, Berha AB. Cancer Science & Therapy The Prevalence of Cancer and its Associated Risk Factors among Patients Visiting Oncology Unit , Tikur Anbessa Specialized Hospital , Addis Ababa-. 2017;9(4):414–21.

25. Maccallum P, Centre C, Melbourne E, Royal T, Hospital M. O ncologist. 2012;998–1004.

26. Lee Y, Chu D, Yang N, Chan C, Cheng S, Pai J. Emergency visits among end-of-life cancer patients in Taiwan : a nationwide population-based study. ??? [Internet]. ???; 2015;1–8. Available from: ???

27. Forero R, Mcdonnell G, Gallego B, Mccarthy S, Mohsin M, Shanley C, et al. A Literature Review on Care at the End-of-Life in the Emergency Department. 2012;2012.

28. Moore BJ, Ph D, Stocks C, Ph D, Owens PL, Ph D. STATISTICAL BRIEF # 227. 2017;96(December 2012):893–908.

29. Emerg A, July M. Recognition and Evaluation of Oncology-Related Symptoms in the Emergency Department. 1995;(July):12–7.

30. Yucel N, Erkal HS, Akgun FS, Serin M. Characteristics of the admissions of cancer patients to emergency department Characteristics of the admissions of cancer patients to emergency department. 2012;(April 2016).

31. Thompson B, Coronado GD, Solomon CC, Mcclerran DF, Neuhouser ML. Cancer prevention behaviors and socioeconomic status among Hispanics and non-Hispanic Whites in a rural population in the United States. 2002;719–28.

32. Geraci JM, Escalante CP. Progressive disease in patients with cancer presenting to an emergency room with acute symptoms predicts short-term mortality. 2006;1038–45.

33. Chowdhury TA. Review Diabetes and Cancer. 2010;(August):905–15.

34. Zachariasse JM, Hagen V Van Der, Seiger N, Mackway-jones K, Veen M Van, Moll HA. Performance of triage systems in emergency care : a systematic review and meta-analysis. 2019;1–9.

ANEX 2: CONSENT FORM

Dear participant, I, Dr. Zerihun Tesfaye (MD, EMCC R3) currently working on a research project on epidemiology and death associated factors of oncology patients of Emergency department of TASH as a fulfillment of my post graduate specialization training in Emergency and Critical care medicine. I believe this research will contribute in efforts on better quality of life for oncology patients.

Here by, I ask you to the part of the research and response accordingly to the questions. I will assure you that your information will be keep confidential and any personal data will not be collect and will not be publish.

I, Ato/Wro……has confirmed by my signature below my consent to be enroll in the study.

Signature

ANEX 3: QUESTIONAIRES

- This Questionnaires is developed to assess the clinical profile of oncologic patients coming to Emergency room of Tikur Anbessa specialized university hospital from January 2020 – June 2020 G.C.
- I believe that knowing this basic information is important in developing protocol for reducing oncology burden in emergency department. Your participation is very crucial to this study. Thank you for participate.

1. Sociodemographic data

1. Age:

2. Sex
   I. Male
   II. Female

3. Marital Status: Single: ☐ married: ☐ Divorced: ☐ widowed: ☐

4. Work: farmer: ☐ government employee: ☐ merchant: ☐ student ☐

other (specify)……

5. Educational status: illiterate: ☐ primary: ☐ secondary: ☐ diploma and above ☐

6. Living area

A. A.A

B. Oromia

C. Amhara

D. Tigray

E. SNNPR

F. Dire dawa

G. Hararai

H. Somali

J. Afar

H. Gambella

I.Benshangul

J. Others (specify)…….

2.Emergency Room Visit:

7. Time of arrival
    I. Day time
    II. Night time

8. Day of arrival
    I. Week days
    II. Weekend

9. Where is the patient referred from (clinics or oncology departments)
    I. Outpatient clinics of TASH
    II. Regional Public institute
    III. Regional private institute
    IV. Addis Ababa public institute
    V. Addis Ababa private institute
    VI. Self-referral
10. Duration of illness before current ED presentation
    I. <2 months
    II. 2- 4 months
    III. 4-6 months
    IV. >6 months
11. ED chief complaint (you can choose more than one)
    1. Fever,
    2. Mentation change
    3. Easy fatigability
    4. Respiratory complaint,
    5. GI complaint (N/V/ decreased appetite)
    6. Pain,
    7. Body weakness,
    8. Bleeding, ulcer,
    9. Body Swelling

10. Difficulty of swallowing

11. Decreased urine output

12. Other …….

12. Emergency Transportation: Ambulance☐ Other transportation☐

13. Number of Emergency Visits:

14. How long did the patient stayed in ED?

3. Clinical profile

15. Reason for ED stays> 24 hours

I. Lack of bed at the ward

II. Diagnosis is not settled

III. Patient doesn't deserve admission

IV. Stayed less than 24hr in ED

16. Outcome of the patients in the ED

I. Admitted to ward

II. Improved and discharged

III. Died

IV. Others (transferred, left against medical advice)

17. Complications:

1. Upper airway obstruction
2. Tumor lysis syndrome
3. Febrile neutropenia and infection
4. Electrolyte abnormality
5. Malignant spinal cord compression or pathologic fracture
6. Malignant pericardial effusion with tamponade
7. Venous Thromboembolism
8. Hyper leukocytosis
9. Malignant pleural effusion
10. Urinary tract obstruction
11. Bleeding
12. Increased ICP or seizure
13. Nausea and vomiting
14. Anemia

15. Other
16. None

18. Smoking Habits: **Yes** ☐ **No**☐

4. oncology:

19. Evidence for cancer diagnosis

I. Tissue biopsy
II. Fine needle aspiration
III. Imaging
IV. Clinically
V. Other

20. Primary tumor location

1. Hematology
2. Lung and pleura
3. Breast,
4. Cervical
5. Esophagus
6. Brain
7. Prostate,
8. GI,
9. GU,
10. Skin,
11. Endocrine,
12. Bone, muscle
13. Neck
14. Others ……

21. Disease stage

I. locally advanced
II. distance metastases

22. Location of metastases

I. Lung and pleura
II. brain
III. liver and spleen
IV. peritoneum
V. bone
VI. urinary system
VII. colon and rectum,
VIII. pelvic organ,
IX. stomach,
X. other

23. Any other co-morbidity

I. Retroviral infection
II. Diabetic Mellitus
III. Hypertension
IV. Asthma
V. Cardiac illness
VI. None

5.Treatment:

24. Previous option

i. . Surgery

ii. Chemo
iii. Radiotherapy
iv. Combination
v. None

25. Analgesic patient is on

I. NSAIDs
II. tramadol
III. Morphine
IV. None

26. Performance status (ECOG)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ **5**

ECOG Performance Status

Grade	ECOG Performance Status
0	Fully active, able to carry on all pre-disease performance without restriction.
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work.
2	Ambulatory and capable of all self-care but unable to carry out any work activities. Up and about more than 50% of waking hours.
3	Capable of only limited self-care, confined to bed or chair more than 50% of waking hours.
4	Completely disabled. Cannot carry on any self-care. Totally confined to bed or chair.
5	Dead