ORIGINAL RESEARCH

Assessing the stage of cancer presentation among patients attending the oncology unit of the Ahmadu Bello University Teaching Hospital, Shika, Zaria, Nigeria.

Raji FO[1]*, Yahuza NN[2], Alabelewe RM[3] and DanMusa UM[4].

[1]Department of Pharmaceutical Services, Council for Legal Education, The Nigerian Law School, Bwari, Abuja, Nigeria; [2]Department of Pharmaceutical Services, Ahmadu Bello University Teaching Hospital, Shika- Zaria, Nigeria; [3]Department of Pharmaceutical Services, Ahmadu Bello University Teaching Hospital, Shika- Zaria, Nigeria and [4]Faculty of Pharmaceutical Sciences, Kaduna State University, Kaduna State, Nigeria

Address for correspondence:
Pharm. Fatimah O. Raji
Department of Pharmaceutical Services, Council for Legal Education, The Nigerian Law School, Bwari, Abuja, Nigeria.
Email: rpharty@gmail.com

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ABSTRACT

Background: Cancer has become a major source of morbidity and mortality globally. Despite the threat that cancer poses to global health, few countries have data on cancer incidence in Sub-Sahara Africa. The stage at which a cancer is diagnosed has a tremendous impact on the type of treatment, recovery, and survival, hence, correct staging is critical in cancer treatment/management.
Objectives: To document stages of cancer presentation among patients who attended the oncology unit of Ahmadu Bello University Teaching Hospital, Zaria for six months and determine the relationship between the stages of presentation and prognosis
Methods: The study was carried out at Oncology and Radiotherapy departments of the Ahmadu Bello University Teaching Hospital, Shika-Zaria located in the Northern part of Nigeria. It was a prospective observational study involving two stages, recruitment stage (6 weeks) and drug therapy follow-up stage (18 weeks). A self-designed data collection form (Proforma) was used. The data collected was analysed to obtained averages and percentages using IBM SPSS Statistics (Version 23) and MS Excel 2013. Descriptive statistics including cross tabulation (frequencies and percent) were performed.
Results: Most patients presented at the late stage (55%) i.e. Stage III and IV which could have led to low prognosis amongst patients.
Conclusion: This study showed that most patients presented at late stage due to different factors such as proximity to the health care centre, strong belief in complementary and alternative medicine, financial constraint, different sociocultural belief among other factors. Public awareness, screening and establishment of cancer centres are hereby recommended.

Keywords: Cancer, cancer stages; presentation; prognosis; Cancer incidence; Oncology unit

INTRODUCTION

Cancer is a group of diseases characterized by the uncontrolled growth and spread of abnormal cells[1]. These cells have the capacity to infiltrate adjacent or surrounding structures or spread to distant sites in the body where they can go on proliferating uncontrollably thus, causing significant morbidity and mortality. Cancer can occur in different anatomical sites in the body[2] and their names are derived either based on the cell of origin or site in the body[3].

Cancer is the second leading cause of death globally and is responsible for an estimated 9.6million death in 2018[4]. Globally, about 1 in 6 deaths is due to cancer[4]. Approximately 70% of deaths from cancer occur in low and middle-income countries[4]. Around one third of deaths from cancer are due to the five leading behavioural and dietary risk: high body mass index, low fruits and vegetable intake, lack of physical activity, tobacco use, and alcohol use[4]. Late-stage presentation and inaccessible diagnosis and treatment are common[4]. In 2017, only 26% of low-income countries reported having pathology services generally available in the public sector[5,6].

Cancer Staging

At the time of diagnosis, stage is a critical indicator of the extent of cancer and its prognostic implications[7]. Accurate staging is essential for informing optimal treatment selection and is necessary for developing valid comparisons of patient outcomes in clinical trials and across different areas of care[8]. As such, cancer staging systems are used to quantify the extent of cancer and provide clinicians and patients with a universal measure of prognosis[8]. By helping to determine appropriate treatment, cancer staging is a fundamental tool for ensuring the best patient outcomes.

TNM Staging System

Clinicians mainly use a staging system, called TNM[9,10]. In the TNM system:

- The T refers to the size and extent of the main tumour. The main tumour is usually called the primary tumour.
- The N refers to the number of nearby lymph nodes that have cancer.
- The M refers to whether the cancer has metastasized. This means that the cancer has spread from the primary tumour to other parts of the body.

The TNM system assesses cancer growth and spread in 3 ways: size/extent of the primary tumour (T), absence or presence of regional lymph node involvement (N), and absence or presence of distant metastases (M). Once the T, N, and M categories are determined, a stage of 0, I, II, III, or IV is assigned, with stage 0 being in situ, stage I being early, and stage IV being the most advanced disease. However, some cancers do not have a stage IV (e.g., testis) and others (e.g., lymphoma) have alternative staging systems. The TNM system is the most widely used cancer staging system, except in brain cancer and hematologic malignancies[11]. Most hospitals and medical centers use the TNM system as their main method for cancer reporting[9]. When cancer is described by the TNM system, there will be numbers after each letter that give more details about the cancer—for example, T1N0MX or T3N1M0. The following explains what the letters and numbers mean:

Primary tumour (T)

- TX: Main tumour cannot be measured.
- T0: Main tumour cannot be found.
- T1, T2, T3, T4: Refers to the size and/or extent of the main tumour. The higher the number after the T, the larger the tumour or the more it has grown into nearby tissues. T's may be further divided to provide more detail, e.g., T3a and T3b[12].

Regional lymph nodes (N)

- NX: Cancer in nearby lymph nodes cannot be measured.
- N0: There is no cancer in nearby lymph nodes.
- N1, N2, N3: Refers to the number and location of lymph nodes that contain cancer. The higher the number after the N, the more lymph nodes that contain cancer.

Distant metastasis (M)

- MX: Metastasis cannot be measured.
- M0: Cancer has not spread to other parts of the body.
- M1: Cancer has spread to other parts of the body[12].

The number staging systems usually use the TNM system to divide cancers into stages. Most types of cancer have 4 stages, numbered from I to IV[11].

Stage I: usually means that a cancer is relatively small and contained within the organ it started

Stage II: usually means that the tumour is larger than in stage I, but the cancer has not started to spread into the surrounding tissues. Sometimes stage II means that cancer cells

have spread into lymph nodes close to the tumour. This depends on the cancer

Stage III: usually means the cancer is larger. It may have started to spread into surrounding tissues and there are cancer cells in the lymph nodes in the area

Stage IV: means the cancer has spread from where it started to another body organ. This is also called secondary or metastatic cancer[11]

Correct staging is critical because treatment is generally based on these parameters, particularly the need for pre-operative therapy and/or for adjuvant treatment and the extent of surgery. Thus, incorrect staging would lead to improper treatment and poor prognosis. The stage at which cancer is diagnosed has a tremendous impact on type of treatment, recovery, and survival. In most cases, the earlier the cancer is detected and treated the higher the survival rate for the patient[13].

Early versus late stage of presentation

Early diagnosis of cancer generally increases the chances for successful treatment by focusing on detecting symptomatic patients as early as possible. Early diagnosis improves cancer outcomes by providing care at the earliest possible stage and is therefore an important public health strategy in all settings. Early diagnosis consists of three steps that must be integrated and provided in a timely manner; Awareness and accessing care, Clinical evaluation, diagnosis and staging, and access to care[14,15]. Delays in accessing cancer care are common with late-stage presentations, particularly in lower resource settings and vulnerable populations. The consequences of delayed or inaccessible cancer care are lower likelihood of survival, greater morbidity of treatment and higher cost of care, resulting in avoidable deaths and disabilities from cancer[16].

There is a need to study the stages of cancer to understand what needs to be done to ensure early presentation for diagnosis and treatment among the health seeking public. This is because:

- There are more than 600,000 deaths annually in Africa from cancer[17].
- A diagnosis of cancer is a very stressful and dreadful event for the patients and their families as they can suffer from clinical levels of depression and severe levels of anxiety and stress reactions[18].
- The incidence of cancer is lower in developing countries than in the developed, yet mortality is higher in developing countries due to late presentation and diagnosis in the developing countries. High literacy rate, better facilities and screening aimed at early diagnosis accounts for low morbidity and mortality in the developed world[19]
- The cancer diagnosis rate in Africa is low, and when most cancers are finally detected it is at a late stage. It is therefore reasonable to suspect that there are many people who die of cancer without ever receiving a formal diagnosis or autopsy to prove their illness[20]
- The stage at which cancer is diagnosed has a tremendous impact on type of treatment, recovery and survival. In most cases, the earlier the cancer is detected and treated the higher the survival rate for the patient. Late presentation of patients at advanced stages when little or no benefit can be derived from any form of therapy is the hallmark of cancer in Nigeria[21].
- Limited or absence of financial support from government or philanthropists to help subsidize cost of cancer therapy[22].

These and other reasons necessitate the need to prospectively look on the stage of presentation in relation to outcome of therapy and to provide established data so as to attract the government and philanthropist to help reduce the suffering on cancer patient, encourage early diagnosis and treatment to improve quality of life.

METHODS

Study Design

This research was a prospective observational study which involved a recruitment phase and the drug therapy follow-up phase

Study Site/Setting

The research was carried-out at the oncology and radiotherapy department of the Ahmadu Bello University Teaching Hospital, Shika-Zaria located in the Northern part of Nigeria.

One of the largest tertiary hospitals in Nigeria and an Oncology centre for excellence with well trained professionals and specialists of diverse discipline and having state-of-the-art equipment with modern facilities.

Inclusion and Exclusion Criteria
All new patients that visited the oncology departments of ABUTH within the stated study periods were included in the study. All patients that visited the departments outside the study periods but did not consent to participate were excluded.

Data Collection
A self-designed data collection form (Pro forma) was used. Information collected included sociodemographic data of the respondents, diagnosis, risk factors, stage of presentation, treatment plan (i.e. Not Completed (N); Completed (C); Interrupted but Completed (I); Not Started (O)), therapy status, prognosis after the six cycles and follow up information (i.e. reason for delay (if any); cost of therapy and any adverse effect).

The Recruitment Phase
First phase was the recruitment of new patients that visited the Oncology unit of ABUTH within the period of six weeks. Relevant information such as age, Hospital Number, Marital Status, Treatment plan, Gender, State of Origin/Residence, Cancer Type, Stage of presentation and occupation were obtained.

The Follow-up Phase
The second phase is the drug therapy follow-up period of 18 weeks (complete six drug therapy cycles) where information such as the expected date of therapy, date of therapy, adherence to therapy, reason for therapy interruption (if any), adverse effects, cost of medication, status of therapy (not started, started but interrupted, completed, not completed) and prognosis after cycle of therapy were documented.

Data Analysis
The data collected were analysed to obtain averages and percentages using IBM SPSS Statistics (Version 23.0) and MS Excel 2013. Descriptive statistics including cross tabulation (frequencies and percent) were used and results were presented as tables, pie charts and graphs.

RESULTS

$$\text{Cancer incidence (\%)} = \frac{\text{No. of new cancer patients}}{\text{No. of all cancer patients}} \times 100\%$$

No. of new cancer patients (6 weeks) = 40
No. of all cancer patients (6 weeks) = 361

$$\text{Incidence (\%)} = \frac{40}{361} \times 100\% = 11.1\%.$$

Table 1 below showed a that most of the participants were female (62.5%).

Table 1: Patient's Demography

Gender	Frequency	Percentage (%)
MALE	15	37.5
FEMALE	25	62.5

Figure 1 revealed that most of the patients presented in Stage II (40%) and III (32.5%). Only 5% of the participants presented in Stage I).

Table 2 revealed that of the 40 cancer types experienced by participants, most cases were cervical (13 cases), breast (6 cases) and head and neck cancer (6 cases) and they often presented at late stages.

Prognosis for majority of the patients was good as in 75% of cases, there was improvement after 6 weeks of therapy. Only one patient (2.5%) died in the same time frame (Table 3).

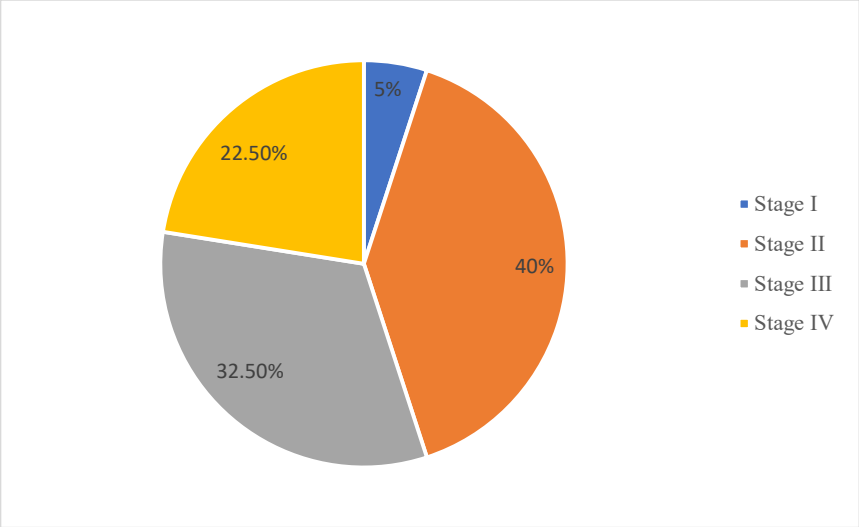

Figure 1: Pie chart representing the different stages of cancer cases.

Table 2: Type of Cancer in relation to Stage of Presentation

Type of Cancer	Stage of Presentation				
	I	II	III	IV	Total
Cervical Cancer	1	8	3	1	13
Breast Cancer	0	1	3	2	6
Head and Neck Cancer	0	0	4	2	6
Sarcoma Cancer	1	2	0	0	3
Anorectal Cancer	0	1	0	1	2
Endometrial Cancer	0	1	1	0	2
Prostate Cancer	0	1	0	1	2
Squamous cell Carcinoma	0	0	1	1	2
Bladder Cancer	0	1	0	0	1
Gastric Cancer	0	0	0	1	1
Ovarian Cancer	0	1	0	0	1
Renal Cancer	0	0	1	0	1

Table 3: Patients Prognosis

Prognosis	Frequency	Percentage (%)
Patient condition improved	30	75.0
No improvement	7	17.5
Patient condition deteriorated	2	5.0
Patient Died	1	2.5
Total	40	100.0

Table 4: Stage of Presentation in relation to the Prognosis of Patients

Stage of Presentation	Prognosis							
	Patient improved		No improvement		Patient deteriorated		Patient Died	
	No.	Percent %	No.	Percent %	No.	Percent %	No.	Percent %
I	1	2.5%	1	2.5%	0	0.0%	0	0.0%
II	12	30.0%	1	2.5%	2	5.0%	1	2.5%
III	9	22.5%	4	10.0%	0	0.0%	0	0.0%
IV	8	20.0%	1	2.5%	0	0.0%	0	0.0%

Table 4 above gives breakdown of prognosis based on staging showing that even with late presentation most of the patients had good prognosis (Stage 2, 30%; Stage 3, 22.5%).

Table 5 revealed that reasons for non-adherence to treatment were mainly financial (58%) and medical (29%).

Table 5: Reasons for non-adherence

Reasons for non-adherence	Frequency (n=31)	Percentage (%)
Financial Factors	18	58.0
Medical Factors	9	29.0
Social/Psychological Factors	4	12.9

DISCUSSION

The findings revealed a high occurrence of cancer in females from among the 40 newly diagnosed cancer patients that presented at the oncology clinic during the study period. This is consistent with previous research conducted by Jedy-Agba in 2012 that showed a higher female incidence than male[23].

Late-stage presentation was prevalent in this study and similar report was made by in a previous study in a state hospital in Nigeria where about 73% of patients presented at a late stage[24].

In addition, similar to the results obtained in this study, a previous study in Nigeria revealed that a large proportion of women with breast cancer presented in the late stage of the disease[25]. Another study which explored the frequency, histological patterns, staging, and grading of the Breast Cancer gene (BRCA) in a tertiary hospital in southern Nigeria documented that about 76% of the breast cancer cases showed late presentation (Stages III & IV)[21].

Results obtained in this study showed that majority experienced improvement in both physical and medical health. The result also that patients in Stage II exhibited greater improvement compared to those in Stage III further emphasizing the significance of early detection and prompt intervention. This is in line with Ezeome's findings[26] that cancers have a better prognosis if diagnosed and treated early.

Financial factors accounted for 58% for non-adherence to therapy. Similarly, higher age groups, negative family history, low level of education, and low socioeconomic status were factors associated with delayed presentation in this study similar to a previous study[27]. The consequences of delayed or inaccessible cancer care according to World Health Organization (WHO) are lower likelihood of survival, greater morbidity of treatment and higher cost of care, resulting in avoidable deaths and disabilities from cancer[4].

CONCLUSION

The results of this study indicate that majority of the patients presented at late stages (Stages III and IV) of cancer, which likely contributed to poor health outcomes, increased morbidity, and elevated medical costs. Financial constraints, medical factors and sociocultural beliefs were found to be factors that contributed to non-adherence to therapy by the patients. Thus, public awareness on the importance of cancer screening and the implications of late presentation in terms of prognosis should be increased. In addition, government and its stakeholders should establish more cancer treatment facilities to enhance access to cancer care.

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The authors hereby declare that there is no competing or conflict of interest in the paper.

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