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Prevalence, Grades and Management of Prostate Cancer among Men Attending Oncology Unit at Bugando Medical Centre Mwanza, Tanzania

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Abstract

Background: Prostate cancer is the second most frequent cancer in men after lung cancer, it accounts for 3.8% of all deaths caused by cancer in men worldwide. This study aimed at determining the prevalence, grades and management of prostate cancer among male patients admitted with cancer at Oncology Department of Bugando Medical Centre. **Methodology:** This was a hospital-based retrospective cross-section study that retrieved data from 384 medical files of male patients admitted with cancer in Oncology wards at Bugando Medical Centre from January 2017 to December 2020. **Results:** The prevalence of prostate cancer was 39.84% (153 of 384 male patients). The mean age of patients with prostate cancer was 64.85 years ± 14.59 years. Two third of the patients' prostate cancer were graded at presentation and of these, 52.58% (51 of 97) were having a high grade prostate cancer of Gleason scores 8, 9 or 10. Treatment involved hormonal therapy, chemotherapy and Radiotherapy whereby 49.48% (n = 190) were treated with hormonal therapy (Goserelin and Bicalutamide), 32.03% (n = 123) with combination of hormonal and chemotherapy, (Goserelin, bicalutamide and docetaxel or paclitaxel), 15.69% (n = 60) with combination of radiotherapy and hormonal therapy and 2.6% (n = 11) with chemotherapy alone (Docetaxel). **Conclusion:** The study found high prevalence of prostate cancer among male patients, majority with high grade form and limited options of treatment. Frequent screening and

awareness programs should be conducted to enable early detection to reduce its morbidity and mortality. Patient on treatment should be followed up to determine their response to treatments.

Keywords

Prostate Cancer, Prevalence, Management, Tanzania

1. Introduction

On a global scale, prostate cancer (PC) ranks number 2 after lung cancer in all cancers affecting men. In 2018 PC accounted for 3.8% of all deaths caused by cancer in men [1]. Although a major important factor for developing PC is age, many studies have reported a trend of higher prevalence of PC in men of African origin compared to other races citing factors like social, environmental and genetic predisposition as the leading factors. A reported PC age-standardized incidence ratio of 19 - 24 per 100,000 in Africa is thought to be underestimated due to known practice of lack of screening, early detection, diagnosis, specialized health care services and proper documentation [2]. In 2011 the PC prevalence was higher in East Africa than in other African regions attributed to lack of regular screening [3]. In the period of 10 years from 2006 to 2015, mortality rate attributed to cancer in Tanzania was, 5.1%, with PC being one of the three major cancers causing deaths making cancers the sixth leading cause of death [4].

Most PC forms are slowly growing tumors which may manifest with symptoms or without obvious symptoms at an early stage [5]. The most common symptoms are difficulty in urination, increased frequency of nocturia, and in advanced stages urinary retention, as well as metastatic symptoms such as back pain and paralysis [6]. These symptoms may also be experienced by men with benign prostatic hyperplasia (BPH), a form of enlarged prostate not linked to cancer. However, a person can have an enlarged prostate at the same time having areas in the prostate gland that contains cancer cells [7]. Prevalence of PC depends much on the exact diagnosis of a disease based on the histological assessment of a procured tissue biopsy by a pathologist. Due to insufficient number of pathologists, some hospitals still rely on diagnosing PC based on the level of prostate specific antigen (PSA) which has low specificity [8].

Management of PC depends on whether the intention is to cure or palliate the disease. There are several treatment modalities which are used in solitary or in combination. These include watchful waiting and active surveillance, interstitial prostate brachytherapy, external beam radiotherapy, radical prostatectomy, hormonal manipulation such as orchiectomy or primary hormonal therapy and the use of chemotherapies [9]. Treatment is usually based on risk stratification [10]. Nonetheless, efficacy of different modalities is not comparable; one study showed that orchiectomy improved the disease status more than other modalities [11]. Moreover, Grade of the PC does guide the choice of treatment modali-

ties. However, in developing country like Tanzania, lack of infrastructure to accommodate all these modalities reduces treatment options, but due to significant improvement in knowledge and economic status we ought to investigate which modalities are currently preferred [12]. Also, determining prevalence, grades and management of PC will help in improving the disease outcome by aiding in planning and allocation of resources. There is scant information on the prevalence and treatment modalities of prostate cancer patients. The aim of the current study was to determine prevalence, grades and management of PC among patients attending Bugando Medical Centre (BMC), Mwanza, Tanzania.

2. Methodology

Study area

The study was conducted at the Oncology Department of BMC. This is a tertiary referral and teaching hospital for the Catholic University of Health and Allied Sciences (CUHAS), located in Mwanza city, on the shores of Lake Victoria, North-Western Tanzania. BMC provides services to approximately 14 million people across an area covering 8 regions which are Mwanza, Mara, Kagera, Shinyanga, Simiyu, Geita, Kigoma and Tabora. The hospital has a capacity of approximately 900 beds.

Study design and duration

A hospital-based retrospective cross-section study that retrieved information from medical files of all male patients admitted with cancer in Oncology wards at BMC from January 2017 to December 2020.

Study population

The study included medical files of male patients admitted with cancer at Oncology ward from January 2017 to December 2020

Selection criteria—inclusion criteria

Medical files of all male patients aged 18 years and above admitted with cancer from any site in Oncology wards at BMC from January 2017 to December 2020

Selection criteria—exclusion criteria

Medical files of male patients with incomplete information on type and site of cancer in men.

Sample size and sampling procedure

The sample size for this study was obtained using the Kish-Leslie formula. Using the prevalence of 50% due to lack of study of similar design, the sample size was calculated by using Kish Leslie formula generating a sample size of 384.

The sampling procedures

The files were continuously collected until the required sample size was reached. Using convenience sampling to obtain equal distribution of number of files per year, 96 medical files of male patients admitted with cancer at Oncology Unit at BMC were obtained from an office of medical records for each year of the study period.

Data collection procedure

Using a pre-constructed check list, data were extracted from the files and later filled in the Microsoft Excel spreadsheet software. The information collected were patients' details such as age at presentation, clinical presentation, investigation of grade of disease, treatment given, duration of follow-up, special management problems and outcome.

Statistical analysis

Data were cleaned using Microsoft Excel software and then transferred to Statistical Package for Social Sciences software (SPSS version 20.0) for analysis. Data of continuous variables were presented as mean, standard deviations or median, interquartile range depending on how they appear, as normal or skewed distribution while categorical variables were presented in frequency distribution tables as percentages or proportions. Furthermore, figure was used to present data of categorical variables.

Ethical considerations

The Ethical clearance to conduct this study was granted by the joint CUHAS/BMC Research and Ethics Review Committee. The ethical clearance and amendment certificate number 1812/2021 was granted. The permission to retrieve patient files was sought from the director general's office of the BMC, who issued a letter of approval which we used to seek further permission from the oncology department where this study was conducted.

3. Results

General Information

A total of 384 male patients' medical files were reviewed. The mean age of studied patients was 64.68 years with Standard Deviation of 15.12 years. More than two thirds of the admitted patients had carcinoma as the type of cancer. The four years prevalence of prostate cancer among male patients admitted with cancer at Oncology Department of BMC was 39.84% (153 of 384 patients admitted) as shown in Table 1.

Almost three quarters of patients with cancer were in the age group of above 60 years old as shown in Table 1.

Grade at Presentation of Prostate Cancer

Prostate cancer was graded by Gleason Score for grading Prostate Cancer. Patients with a Gleason score of 6 or below were considered to have low-grade prostate cancer, whereas patients with a Gleason score of 7 were considered to have a medium-grade prostate cancer, and patients with a Gleason score of 8, 9 and 10 were considered to have a high-grade prostate cancer. Of the 153 patients with Prostate cancer, 97 (63.40%) were graded. Only about one third of the Prostate cancer patients had a disease which was not graded at presentation. Half of the graded patients had a high-grade prostate cancer as shown in Table 2.

About half of the patients had a high-grade prostate cancer at presentation of Gleason score 8, 9 or 10. Of these, 83.5% were in the age group of above 60. In all grades at presentation of prostate cancer, the age group of above 60 years old

Table 1. General patients characteristics (N = 384 patients' medical files).

Variable	Frequency	Percentage (%)
Age group		
18 - 59	109	28.39
Above 60	275	71.61
Type of cancer		
Carcinoma	262	68.23
Lymphoma	27	7.03
Melanoma	5	1.30
Sarcoma	50	13.02
Prostate cancer	153	39.84

Table 2. Grade of prostate cancer at presentation.

Variable	Number of patients	Percentage
Grade assigned		
No	56	36.60
Yes	97	63.40
Grade at presentation		
Gleason 6 or lower	30	30.93
Gleason 7	15	15.46
Gleason 8, 9, 10	52	53.61

was the most prevalent as shown in Figure 1.

Treatment regimens used in Prostate Cancer at Oncology Department, BMC.

The current study found the use of different types of treatment modalities for different patients. However, all of the 153 patients with Prostate Cancer had a stable outcome after management. Two third of patients were put on goserelin at a dose of 3.6 mg or 10.8 mg. Two third of these, were also on bicalutamide, therefore they received a combination of goserelin and bicalutamide. Other patients 12.4% (19 out of 153), 3.27% (5 out of 153), 4.6% (7 out of 153), 3.92% (6 out of 153) received Taxanes (docetaxel or paclitaxel) with hormonal drugs, bicalutamide only, docetaxel only and gemcitabine respectively as shown on Table 3.

Generally, majority of patients 67.3% (103 out of 153) were treated with hormonal therapy (Goserelin and Bicalutamide) as shown on Table 4.

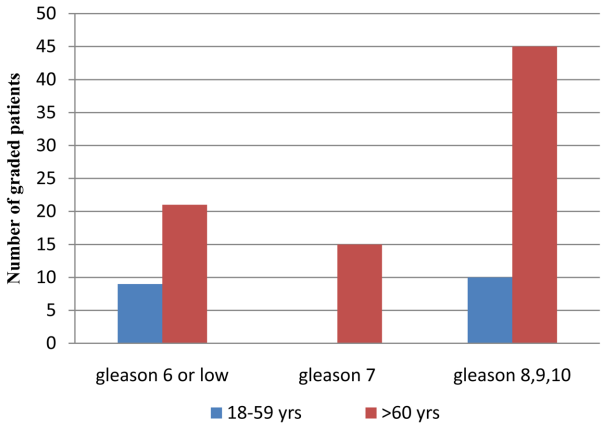

Figure 1. The distribution of age groups against stage of prostate cancer at presentation.

Table 3. Treatment regimens (Drug and dose) used for prostate cancer management at BMC.

Treatment regimen	Number of patients	Percentage
bicalutamide 50 mg only	5	3.27
bicalutamide 50 mg and docetaxel 120 mg only	2	1.31
docetaxel 120 mg only	3	1.96
gemcitabine 1 mg only	6	3.92
goserelin 10.8 mg and bicalutamide 50 mg only	21	13.73
goserelin 10.8 mg and bicalutamide 100 mg only	1	0.65
goserelin 10.8 mg and bicalutamide 150 mg only	8	5.23
goserelin 10.8 mg, docetaxel 120 mg and ondansetron 16 mg only	2	1.31
goserelin 10.8 mg and docetaxel 120 mg only	4	2.61
goserelin 10.8 mg and tamsulosin 0.4 mg only	2	1.31
goserelin 10.8 mg, bicalutamide 150 mg and docetaxel 120 mg only	5	3.27
goserelin 3.6 mg and bicalutamide 100 mg only	4	2.61
goserelin 3.6 mg and bicalutamide 150 mg only	4	2.61
goserelin 3.6 mg and bicalutamide 50 mg and docetaxel 120 mg only	18	11.77
goserelin 3.6 mg and docetaxel 120 mg only	5	3.27
goserelin 3.6 mg and paclitaxel 330 mg	1	0.65
goserelin 3.6 mg, bicalutamide 50 mg and ondansetron 16 mg only	2	1.31
goserelin 3.6 mg only	13	8.50
Goserelin 10.8 mg only	38	24.84

Table 4. Treatment modalities used to treat prostate cancer at oncology clinic of BMC.

Therapy	Number of files	Percentage
Hormonal therapy	103	67.32
Hormonal + Chemotherapy	19	12.42
Chemotherapy	7	4.58
Hormonal + Radiotherapy	24	15.69

4. Discussion

The current study aimed to determine the prevalence, grade at presentation, and management of prostate cancer among men with cancer at Oncology Department, BMC. The four years prevalence of prostate cancer was found to be 39.84% among all cancers affecting men. This is higher compared to reported prevalence of 21.71% by Isaac H et al on prevalence of incidental prostate carcinoma among patients undergoing Turp for benign prostatic enlargement [13]. Although all studies were retrospective done in referral hospitals, the current study was done in area which is an endemic of Schistosomiasis a factor reported by several studies to be associated with emergence of prostatic carcinoma [14]. In addition, the second study was just observing specific group of male patients with prostatic enlargement in contrast to the present study which observed information of all male patients. Another study by Daniel Gunda et al in the same hospital as the current study but focusing on specific group of patients with prostatic enlargement found the incidental prevalence of 21.71% which is low [15]. The prevalence presented by the current study seems to be under estimation of all PC in the referral hospitals as it didn't include data from urology clinic where patient's records for those who undergo radical prostatectomy are kept. It is estimated that the annual incidence of prostate cancer in Africa is 16.4% which translate to the prevalence of over 48% over a period of 3 years [16]. In addition, the prevalence reported by the current study is relatively higher than the prevalence of 15.20% reported earlier in United Kingdom [17] [18] [19]. The difference could be explained by different methodologies but also the evidence that PC incidence is higher in men of African origins than Caucasians. Similarly, it is higher than the reported prevalence of 37.30% determined on autopsy among Unscreened Caucasian men [20]. Furthermore, prevalence depends on diagnostic procedures done before arriving to a conclusion that it is PC. A study done in 2008 showed the prevalence of PC diagnosed incidentally by prostate specific antigen (PSA) was higher 14.90% than when other methods were used 5.20% [21]. Almost three quarters of patients presented by the current study were in ages above 60 years supporting the evidence that, prostate cancer risk increases with age. Similar study done in Australia in 2015 showed the prevalence of prostate cancer was higher in the age group of above 65 years [22]. About half of all PC patients had high grade disease. This could be due to late presentation at the hospital because of factors like distance from the health facil-

ities, lack of financial capacity to pay hospital bills, seeking alternative treatment before going to the hospital and delaying referral system to patients. This is comparable to another study done at Muhimbili national hospital which reported 61% had intermediate score of 5 - 7 but concluded the lack of association between Gleason score and aggressiveness of the PC [23] [24]. The difference with the current study could be due to the difference in the methods of data collection between the two studies. The current study noted the stable progression of all PC patients but other studies have reported disease aggression defined by Gleason score above 7 [25]. Over 67% of PC patients were put on hormonal therapy. This is in accordance to the current Tanzania treatment guideline (STG) which suggests the use of goserelin at a dose of 3.6 mg and 10.8 mg and/or bicalutamide (50 - 250) mg for the treatment of late phases of the disease. Moreover, the use of chemotherapy for few patients was in accordance to STG which suggests the use of docetaxel 75 mg/m^2 every three weeks. However the current study found the use of paclitaxel which is not suggestion of the STG, carboplatin is the other chemotherapy suggested. Also it didn't found the use of more effective drugs like abiraterone acetate 500 mg per oral (PO) or enzalutamide 160 mg PO daily as suggested by the STG for castrate resistant prostate. These two drugs are expensive and not easily available in the country and enzalutamide is not on the essential medicine list [26] [27] [28]. The current study showed that all participants had late disease presentation. This would be due to lack of awareness or low level of screening practices among men in this region which is also an attributing factor for an increase in PC incidence. A study done on awareness in the southern part of Tanzania showed the increase of awareness. This study showed an awareness proportion of 78% with the source of information being mass media campaigns. Another study conducted in Dar es salaam showed over half 52.1% had poor knowledge which influenced their participation into PC screening services. Only 7.7% of participants reported to have undergone PC screening services [29]. These data are also supported by the global cancer observatory report published by World Health Organisation (WHO) in 2020 [30].

This study generated data from a single center which is a tertiary hospital, patients seen at this hospital may not be representative of all patients in the country. However, It shows the prevalence which can be used in the planning and allocation of resources. Furthermore, it gives a representative prevalence of PC in referral hospitals in the country and data can be included in the establishement of countrywide cancer registry.

5. Conclusion

This study has shown a high prevalence of prostate cancer among male patients admitted with cancer at Oncology Department of BMC. Frequent screening and awareness programs among men should be done so as to early detect prostate cancer cases and reduce the morbidity and mortality due to prostate cancer.

Conflicts of Interest

The authors declare to have no competing interest in this study.

Data Availability Statement

Datasets for this study can be accessed on reasonable request to the corresponding author.

Author's Contribution

DMK, JJ, WM and SM designed the study. KJM and PR did the statistics. DMK drafted the manuscript and all authors critically reviewed it and provided approval for publication.

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Appendix: Data Collection Tool

The designed check list which was tested to see if it captures information answering all objectives was as shown,

SN.	Patient file no	Age	Education level	Cancer site (CNS, Head & Neck, lung, lymphoma prostate, soft tissue, GIT, urinary bladder, thyroid	Is prostate present?	If yes, what is the stage at presentation	Not staged	Duration of symptoms	Management type	Outcome