The Prevalence of Prostate Cancer among Urology Neoplasms at Ndola Teaching Hospital

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Abstract

Background: Cancer of the Prostate is one of the leading cause of cancer death in men and its incidence rates are expected to continue escalating. Globally it is the second most common cancer affecting older men and it presents with a need to urinate frequently, weak and dribbling of urine, painful urination, and blood is seen in urine or semen.

Aim: was to determine the pattern and distribution of Urology neoplasms, particularly cancer of the prostate gland seen at Ndola Teaching Hospital.

Methodology: In this study a retrospective cross section study design was used, data was collected and sampled by complete enumeration of all urology patient's files that visited Ndola Teaching Hospital from June 2018 to August 2020. Out of a total of 404 urology patients files enrolled, 212 were diagnosed urological neoplasms. Data entry involved tabulations and use of SPSS software for analysis. All information collected was confidentially handled in accordance with the ethics. Ethical approval was obtained from Tropical Disease Research Centre (TDRC) and permission to conduct the study at the health institution was granted by both the Provincial Health Office and Hospital administration.

Results: The prevalence of prostate cancer among urological neoplasms seeing at NTH was found to be 44.3%. It is densely distributed and more common between the ages of 70 to 79 years old. Other urological neoplasm such as Benign Prostatic Hyperplasia, Penile Cancer, Bladder Cancer, Kidney Cancer and Testicular cancer recorded the prevalence of 42.9%, 6.1%, 6.1%, 0%, 0.5% respectively. No single case was recorded above the age 90 this could be due to patients dying before reaching the age of 90.

Conclusion and recommendations: At this prevalence of 44.3%, there is need to implement screening strategies, sensitize and encourage people to always visit hospital care for regular checkups, more especially when the male gender starts to advance in age and experiencing symptoms of the impending prostate cancer. Although there is no strong evidence yet on how to fully prevent prostate cancer, it is very possible to lower the risks of developing it by stopping to take alcohol, to cease smoking, limit high fat foods, increasing the intake of vegetables and fruits and performing more exercise.

Keywords: Prostatic hyperplasia • Penile cancer • Bladder cancer • Kidney cancer • Testicular cancer

Introduction

Background information

Prostate cancer is one of the urological malignancies, a disease of men older than 50 years, and its incidence increases from 20%, in men who are in their 50s, to approximately 70%, in men between the ages of 70 and 80 years [1]. According to Anton et al. the incidence of prostate cancer is increasing steadily and by year 2050 estimates are that the number of men with over 65 years with prostate cancer is expected to increase 4-fold worldwide and by 2030, the percentage of men older than 65 years will rise to 19.6% from the 12.4% population that was recorded in 2000, putting the current lifetime risk of developing prostate cancer at 16.7% (1 in 6 men) [2].

Urological Neoplasms include, Bladder Cancer, Prostate Cancer, Penile Cancer, Testicular Cancer, Kidney Cancer and Benign Prostatic Hyperplasia.

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Prostatic Diseases are simply diseases of the prostate gland which may include Prostatitis, Benign Prostatic Hyperplasia (BPH) and Prostate Cancer (PCa). Prostatitis clinically presents with fever, chills, dysuria, lower back pain, and perineal suprapubic discomfort. It is cause by infection with bacteria and sometimes the causes are due to surgical interventions. Benign prostatic hyperplasia (BPH) and Prostate Cancer (Malignancy) are extremely common abnormality more present in a significant number of men by the age of 40, and the frequency rises progressively with age, reaching 90% by the eighth decade of life. BPH is characterized by proliferation of both stromal and epithelial elements, with resultant enlargement of the gland and, in some cases, urinary obstruction. Despite BPH having some symptoms that mimic PCa, BPH does not transform into a cancer, for it is not linked to and neither does it increase the risks of getting PCa [3].

Globally, Prostate Cancer is rated the second most common cancer and sixth leading cause of cancer death among men, with an estimation of over 1.1 million cases and 300,000 deaths [4]. In Australia, Martin Reported that the commonly diagnosed cancer is Prostate cancer and that 9 men die every day from the same disease. According to the American Cancer Society, Prostate Cancer deaths are 26,730 and the estimates for new prostate cancer case are 161,360.

In Africa, the highest Prostate cancer rates are seen in Western-Africa and so it is at global level. According to Lisa, 63% cases of prostate cancer were recorded in Harare, the capital city of Zimbabwe, from 1998 to 2002. Meanwhile Zambia ranks prostate cancer number 14 on the common top 20 listed causes of death in the country. Lisa further deduces that most nations across the globe preoccupied with African men are affected with prostate cancer as seen among black Africa-Americans.

Statement of the problem

In Zambia, the developing country, prostate cancer, is the second most common cancer with 55% increase in the past 20years, it kills at its deadliest peak older men aged 80 and above with 30-34 its lowest rate. Additionally, it is the most urological malignancy presented by men [4].

Mortalities from prostate cancer are on a rise due to the associated risk factors and poor early screening in some developing countries. Elderly people not sensitized to prostate cancer symptoms will always think, frequent urination especially at night, difficulties in starting or stopping urination is a normal experience in their old age. However much as it may be a normal presentation with BPH, these symptoms should not be neglected otherwise an impeding developing cancer of prostate may be missed and only to be diagnosed at an advanced end stage. Hence the need to educate people about early signs of PCa and the importance of its early screening.

Despite this vast increasing information about prostate cancer and its increase in prevalence and mortality rate, there is less that has been done at Ndola Teaching Hospital (NTH) to determine its magnitude. Hence the need for a retrospective study to establish the trend of prostate cancer among all urological neoplasms at NTH.

Literature Review

Worldwide, Prostate cancer is the second most common cancer in men and is now the fifth leading cause of cancer-related deaths [3]. In 2015 the risk of developing this disease was at 9.5% and at 2.9% risk of dying from prostate cancer.

Cancer already constitutes a major public health burden globally. Ferlay et al, reported in 2012 that, there were 14.1 million new cases and 8.2 million deaths from cancer worldwide. It was also proposed by Ferlay et al that the burden of cancer is expected to rise, with over 75 million prevalent cases, 27 million incident cases and 17 million cancer deaths expected globally by 2030. Adeloye et al further alludes that, prostate cancer is the second most common and the sixth cause of cancer deaths in the world.

According to Narayan et al, the incidences of all cancers are increasing in developing countries. Bray and Moller stipulated that developing countries accounted for 55% of all cancer cases in 2007, and it is proposed that by 2050, developing countries will account for 61% of all cancers of which 26% will be cancers due to infections. Since the inception of the Cancer Disease Hospital (CDH), in Zambia more than 17,000 cancer cases have been diagnosed and treated in Lusaka at CDH [6].

The most common type of cancer been treated at CDH in Zambia is cervical cancer followed by Prostate cancer then Kaposi's sarcoma. Based on the study that was conducted on Prostate Cancer Incidence Rates in Africa by Lisa et al. it was seen that incidence rates for prostate cancer were high in African Americans. This giving a notion that prostate cancer prevalence globally affects mostly black men as compared to other races. It was said that African American men have the highest reported prostate cancer rates in the world, but now incidence appears to be rising in several African countries also and according to the publication by Parkin et al. the highest estimated rates of prostate cancer in Africa are seen in the South followed by Central, West, East, and North African regions in that order. Thence it is true that "There are some remarkable and puzzling national and racial differences in the incidence of the disease. Prostatic cancer is uncommon in Asians and occurs most frequently among blacks."

Apart from National and Racial differences, studies such as the one conducted by Sierra et al., have shown that they are several factors that are associated with prostate cancer etiology. These other factors includes, age, family history, hormone levels and environmental influences. Cases of prostate cancer have been observed to be of high incidence in men above age 50years, and autopsy studies have shown that the incidence of prostate cancer increases from 20% in men in their 50s to approximately about 70%in men between the ages 70 and 80 years [7].

As earlier alluded to, at the Cancer Disease Hospital (CDH) in Lusaka Zambia, more than 17,000 cancer cases have been diagnosed and treated. The most common type of cancer been treated at CDH is cervical cancer followed by Prostate cancer then Kaposi's sarcoma.

In Zambia Prostate cancer is one among the common top 20 listed causes of death and ranks number 14 thereon. Bowa et al, a retrospective study done on Urological Malignancy, found Cancer of the prostate as the most common urological malignancy at (54.6%), followed by bladder cancer (21.1%) and penile cancer (18.6%).

According to the World Health Organization, the country profile showed that 21.8% of cancer deaths were due to prostate cancer. The profile also showed that out of the top 5 cancers in males, prostate cancer was the second with an incidence of 594 out of 2,604 total cancer cases.

The study by Zyaambo et al. that analyzed The Zambia National Cancer Registry (ZNCR) data of 1990 to 2009 and determined the distribution of cancers in Zambia reported the Copperbelt Province to have 107 male cancers at 2.3% of all male cancers. With this rise in cancer cases statistics are expected to change.

Being among the most common cause of death in men. In Zambia according to the report by Elem and Patil, Prostate cancer was in 1991 reported to have accounted for 204/784 (26percent) of the urologic cancers and 204/6,514 (3 percent) of all cancers identified among the indigenous Zambian population over 8-year period on the basis of pathological reports from a major national hospital in Lusaka. According to a retrospective study by Bowa et al. prostate cancer was the fourth most common cancer in men, in the contrast Zyaambo et al. reported it to be the second most common cancer in men. This disparity may be due to time difference on which the studies were done and also the discrepancy in sources of data. From this, however the, difference we deduce that there has been a change in the cases and prevalence of prostate cancer in Zambia. With it being the second common cancer in men, prostate cancer kills men at the lowest rate at age 30-34 and its deadliness peaks at age 80.

It is clear that previous studies by Elam and Patil, collected their data from a limited (urban) population and were not representative of the entire Zambia population at that time.

Objectives of the study

Main objective: To determine the pattern and distribution of Urological neoplasm, particularly cancer of the Prostate gland, Seen at Ndola Teaching Hospital (NTH) in Ndola.

Specific objectives:

- To determine the prevalence of Prostate Cancer among Urological neoplasms at NTH
- To establish association between age and prostate cancer
- To determine whether they have been a decline or an increase in Prostate Cancer cases from 2018 to 2020.

Justification of study

Seeing that, globally Prostate Cancer is the most common cancer, and the leading cause of death amongst all urological malignancies, and its Incidence Rates high in Africa Lisa et al. while low rates are seeing among Asians and Japanese Jonathan. In Zambia, Prostate cancer is among the top listed common causes of death in men.

A study that was conducted by Bowa et al, on urological malignancy, prostate cancer in particular, pattern does not give us information on the urological malignancy pattern at NTH, for that study only focused on clinical records and pathological specimen at UTH, excluding Ndola and other places [5].

It is in this respect that this study should be carried out to provide this needed relevant information regarding the pattern of prostate cancer among all urological neoplasms at NTH. It will as well help the Ministry of Health to implement and promote cancer screening facility services, to encourage and sensitize people on the importance of utilizing these clinical facilities.

Measurements

Urological neoplasms cases: All urology patients files with diagnosis of Bladder Cancer, Prostate Cancer, Penile Cancer, Testicular Cancer, Kidney Cancer and Benign Prostate Hyperplasia.

Prostate cancer patients: A urology patient with diagnosed prostate cancer and are recorded in the urology case files (Figure 1).
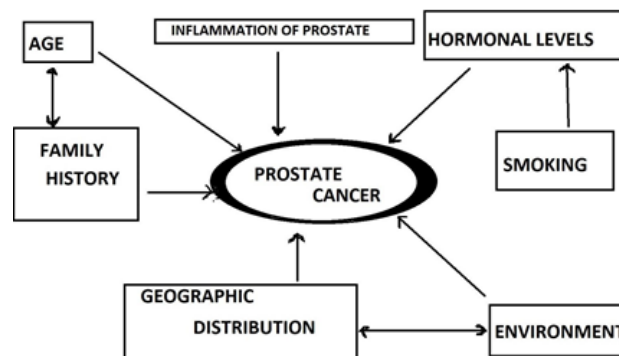

Figure 1: Conceptual frame work.

Though the exact cause of Cancer of prostate cancer are to be determined, some sorted factors associated with predisposition to cancer of the prostate include old age, family, hormonal imbalance, lifestyle such as smoking and alcohol, environment, geography distribution, eating habits, heredity, gene mutation and other genetic changes [2].

Methodology

Site of study

The study was conduct in Ndola at Ndola Teaching Hospital. Ndola is a city in Zambia, Located on the Copperbelt province with total population. Ndola is 320 kilometers north of Lusaka and is the third largest city after Lusaka and Kitwe. Its two major hospitals are namely Author Davison's Children Hospital and Ndola Central Teaching Hospital and It recorded with the population of 455194 [7].

Design

Retrospective Cross Sectional Study design was used to review urology neoplasm records from 2018 to 2020.

Study population

Individuals diagnosed with urological neoplasms, including prostate cancer cases at Ndola Teaching Hospital.

Sample size determination

Complete Enumeration of all urological neoplasm records from June 2018 to August 2020 at NTH

Target population

Inclusion criteria:

- Male Urological patient's files
- All individuals with diagnosed urological tumors
- Diagnosed Prostate cancer cases
- Population from 2018 to 2020
- All age groups

Exclusion criteria:

- Non- male urological patient's files
- Un-Recorded urological tumors
- Population before year 2018 and after the year 2020
- Urological non-tumor cases

Data collection

Data was collected by reviewing urological clinical registers or records at Ndola Teaching Hospital.

Data analysis

Data entry and analysis was done using trend analysis on the latest computer software SPSS, to generate the pattern and distribution by age and year within the stipulated time.

Ethical clearance

Ethical clearance was obtained from the Ethical Boards Tropical Diseases Research Center (TDRC) and The Copperbelt University to ensure misconduct and violation of ethics is avoided.

With respect to ethics, the research upheld confidentiality and informed consent. This was done by explaining the research and its purpose fully to the intended participants. Both advantages and disadvantages such as disturbances and discomfort that were to be felt and experienced during that time of retrieval of hospital file records. It was also explained to the person in charge of supervision in the process of data collection, that they were free to withdraw and report any misconduct, misuse or inappropriate use Clinical Records observed, if any was to be observed. Moreover the research proposal was submitted to ethical board for scrutiny to ensure that sound ethical consideration are upheld before the research is carried out, and approval was given. Additionally the information gathered is kept strictly confidential.

Lastly, the NTH management was availed with a consent form with full details of how records were to be handled during the research study and that participation is voluntary even though the study was fully dependent on their consent [4].

Report

The aim of this research was to determine the pattern and distribution of Urological neoplasm, particularly cancer of the Prostate gland, Seen at Ndola Teaching Hospital (NTH) in Ndola.

The files that were available during data collection were files only from 2018 June to 2020 August 2020 and by Complete Enumeration

of all available patients files with diagnosed urological neoplasm, were files sampled.

Data analysis

Data for urology cases was collected from the Surgery Department Registry book, which captured patients from 2018 June to 2020 August by use of a structured data collection tool. Data was then later processed manually and entered on the data master sheet. This exercises included tables, frequency counts, percentages and comparison of variables. Cross tabulation of variables was done to show relationship among variables in numerical form [6].

Presentation of findings

The total number of patients that visited NTH Surgery department during the study period were 2988. 13.5% (404) patients visited the urology department. Out of the total number of patients that visited the urology department 52.5 % (212patients) were diagnosed with Urological neoplasm.

For this research, we define Urological Neoplasms as to include Prostate cancer (PCa), Benign prostatic hyperplasia (BPH), Penile cancer (PenCa), Bladder cancer (BlaCa), Kidney cancer (KidCa) and Testicular Cancer (TesCa) while Urological Malignancies as to exclude Benign prostaic Hyperplasia (Table 1).

YEAR	MONTH	NO. MONTHS	TOTAL UROLOGICAL CASES
2018	June to December	7	113
2019	January to December	12	203
2020	January to August	8	88
TOTAL NUMBER OF:		27 Months	404 Patients

Table 1: The total number of patients that visited urology department per given months period per year.

It highlight that of all the patients that visited surgery department 404 had urological problems or diseases (Table 2).

YEAR	MONTH	NO. MONTHS	TOTAL UROLOGICAL NEOPLASMS
2018	June to December	7	76
2019	January to December	12	94
2020	January to August	8	42
TOTAL NUMBER OF:		27 Months	212 Patients

Table 2: The total number of urological patients that had urological neoplasms per given months period per year.

YEAR	FREQUENCY	PERCENTAGE (%)
2018	76	36
2019	94	44
2020	42	20

212 Patients	100%	

Table 3: The frequency and percentage of urological neoplasms that were recorded.

Frequency tables

It promulgates that a total of 212 urological neoplasms were diagnosed during the study period, and the distribution of the urological neoplasm were as shown in table 3.3.4 below with the highest recorded being Cancer of the prostate at 44.3% (94), followed by BPH at 42.9% (91)and the least being Cancer of the Kidney at 0% (Table 4).

YEAR	PCa	BPH	PenCa	BlaCa	KidCa	TesCa	TOTAL
2018	34	32	6	4	0	0	76
2019	43	40	5	5	0	1	94
2020	17	19	2	4	0	0	42
TOTAL	94	91	13	13	0	1	212
PERCENTAGE	44.3%	42.9%	6.1%	6.1%	0%	0.5%	100%

Table 4: The prevalence of each urological neoplasms.

A total of 121 Urological Malignancies were diagnosed during the study period, and the distribution were as shown in the table 3.3.5 below with the highest recorded being Cancer of the prostate at 77.7% (94), followed by Cancer of the Penis and Bladder at 10.7% (91) and the least being Cancer of the Kidney at 0% (Table 5).

YEAR	PCa	PenCa	BlaCa	KidCa	TesCa	TOTAL
2018	34	6	4	0	0	44
2019	43	5	5	0	1	54
2020	17	2	4	0	0	23
TOTAL	94	13	13	0	1	121
PERCENTAGE	77.7%	10.7%	10.7%	0%	0.8%	100%

Table 5: The total number and percentage of each urological malignancies.

The table highlights that the prevalence of patients that presented with urological neoplasm among all patients that visited NTH Urological department from June 2018 to August 2020 was 52.5% (Table 6).

YEAR (MONTH)	FREQUENCY		PERCENTAGE (%)
	NEOPLASM	UROLOGY	
2018 (Jun to Dec)	76	113	67
2019 (Jan to Dec)	94	203	46
2020 (Jan to Aug)	42	88	48

TOTAL PERCENTAGE	52.5%	AVARAGE (53.7%)

Table 6: The percentage of urological neoplasm per given months per year.

It was noted that prostate cancer is more common about the average of 75years old with 52.9% prevalence (Table 7).

PROSTACE CANCER DISTRIBUTION BY AGE		
AGE GROUP	NUMBER OF PATIENTS	PERCENTAGE
< 59 years	10	10.3 %
60 – 69 years	18	19.6 %
70 – 79 years	50	52.9 %
80 – 89 years	16	17.2 %
> 90 years	0	0 %
TOTAL	94	100 %

Table 7: Prostate cancer distribution by age.

Benign prostatic is common about 60 to79 years at average 36.9%prevalence (Table 8).

BENIGN PROSTATIC HYPERPLASIA DISTRIBUTION BY AGE		
AGE GROUP	NUMBER OF PATIENTS	PERCENTAGE
< 59 years	12	13.1 %
60 – 69 years	33	36.3 %
70 – 79 years	34	37.5 %
80 – 89 years	12	13.1 %
> 90 years	0	0 %
TOTAL	91	100 %

Table 8: The distribution of benign prostatic hyperplasia by age.

Discussion

Urological neoplasms in this study represent 7.0% of all patients that visited NTH surgery department and 52.5% of all patients that visited NTH Urology department in Ndola in the period June 2018 to August 2020.The prevalence of prostate cancer among urological neoplasms was, according to this research findings, found to be 44.3%. Pointing out that it is the most common cancer affecting men in Zambia. Studies conducted at the UTH revealed that prostate cancer was the most common cancer among men [5]. This is in agreement with the data of most cancer registries in the same region in Africa, which reported prostate cancer to be among the most prevalent cancers in men. This being in contrast to Zwaambo et al. who reported it to be the second most common cancer in men. This difference may be partly due to different sources of data and the period the study was done.

It was also noted that, the magnitude of the prostate cancers was close to that of benign prostatic hyperplasia, this signifying that men have equal chances of having either, despite the fact that benign prostatic hyperplasia does not result into development of prostate Cancer.

Even though factors that really contribute to the development of prostate cancer in Zambia and other countries have not yet fully been established, prostate cancer screening using PSA testing has proved to reduce the incidence and mortality of this cancer. In Zambia, the incidence of prostate cancer was reported to have increased by 55%in the last 20 years, and this increase was attributed to better health education and improved urological services such as PSA testing and prostatic biopsy. Despite these findings, there is a need to further promote the importance of prostate cancer screening. Advancing in age, is one amongst the factors linked to development of prostate cancer. According to our finds the distribution of prostate cancer by age stands at 55 % at the age group between 70 to 79 years old with few cases seen in patients less than 59 years old. The lowest recorded age present was 42 years old. We did not record any case of PCa above the age of 90 this could be due to the majority of patients dying before reaching the age of 90.

The data as to whether Smoking and Alcohol usage highly contribute to one having prostate cancer cannot be concluded upon since we could not finding sufficient data to help us reaffirm and conclude as such.

Though there is no strong evidence yet on how to prevent prostate cancer, it is very possible to lower the risk by stopping to take alcohol, to cease smoking, limit high fat foods, increasing the intake of vegetables and fruits and performing more exercise.

Our findings review that cancer of the prostate is indeed the leading neoplasm that patients will present with hence the need to educate people and how they can minimize the risk of acquiring it.

The prevalence of other urological neoplasms were Benign prostatic hyperplasia (42.9%), Penile cancer and Bladder cancer had the same prevalence at (6.1%), with least common Kidney cancer and Testicular cancer at 0% and 0.5% respectively.

Conclusion

The prevalence of prostate cancer among urological neoplasms at NTH was found to be 44.3% making it the leading common cancer in men at NTH and that it is more common between the ages of 70 to 79 years old. Following prostate cancer is BPH which at a prevalence of 42.9%. Kidney and Testicular neoplasms are the most uncommon. With the prevalence of 44.3%, there is need to implement screening strategies, sensitize and encourage people to always visit hospital care for regular checkups, more especially when the male gender starts to advance in age and experiencing symptoms of the impending prostate cancer. Although there is no strong evidence yet on how to fully prevent prostate cancer, it is very possible to lower the risks of developing it.

Limitations

The limitations to the study were

- Few files than expected were found, hence only 2018, 2019, 2020 files were utilized instead of files from 2016 to 2020
- Some Information of interest was not documented in the files hence limiting the study area of discussion
- Overwhelming work overload in reviewing files

Recommendation

- Find a more appropriate way of storing patients files
- Need for a specific cancer registry book only
- Further studies to be carried on
- Promotion and implementation of strategies to sensitize of early screening.

Acknowledgment

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