

Prostate cancer in patients with suspected benign prostate hypertrophy in Juba, South Sudan: A retrospective study

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ABSTRACT

Introduction: Prostate cancer carries a high morbidity and mortality especially when not diagnosed early. Patients in resource limited countries tend to be diagnosed late and hence delayed surgery for benign prostate hypertrophy (BPH).

Method: This was a retrospective study, from 1st January 2019 to 31st December 2020, on patients who underwent prostatectomy. Demographic and clinical data were extracted from their medical records.

Results: This study involved 101 patients who had had simple open prostatectomy. Ages ranged from 49 to 98 years, mean 68 +/- 8.98 years. The largest group (37.6%) was aged 71- 80 years, $p=0.001$. Two thirds (66%), presented with urinary retention, $p=0.03$. Histopathological examination showed that 49.5% had BPH. Prostate cancer was found in 28.8%, $p=0.082$. Almost half (49.5%) were diagnosed histopathologically as having BPH. Prostate cancer made up 28.8% with most patients in the age range 61-80 years, $p= 0.456$.

Conclusion: The prevalence of prostate cancer remains high among patients undergoing prostatectomy for suspected BPH. A national awareness campaign coupled with targeted screening of patients above 40 years could increase early detection of prostate cancer and reduce morbidity and mortality.

Keywords: Benign prostate hypertrophy, histopathology, prostate cancer, Juba Teaching Hospital

INTRODUCTION

Globally prostate cancer, an adenocarcinoma, is an increasingly important health burden. It is estimated that 0.9 million cases and 0.26 million deaths from prostate cancer occur annually.^[1] It is the second leading cancer in men and the fifth cause of malignancy worldwide.^[2] Nevertheless, there is a broad variation of prostate cancer occurrence in developed countries with 180,890 new cases recorded in USA, and with 26,120 deaths in 2016 as the highest.^[2]

Studies indicate a rising incidence of prostate cancer in low- and middle-income countries especially in Africa.^[3] In Africa, this malignancy is the leading cancer in both incidence and mortality: 13% of all male cancers and 11.3 % of all male cancer-associated mortalities.^[1] Reported incidence among African American men is among the highest but African data are unclear. A literature review compared data from Africans and African Americans and found that rates were highest in the East Africa, 10.7-38.1 per 100,000 male-years and lowest in the West Africa, 4.7-19.8 per 100,000 per male-years.^[4] It has been observed that rates increased between 1987 and 2002.^[3] This may be due to variation in access to medical services, screening programmes, registry quality, genetic diversity, and western life style^[4] among the Africans and African Americans. Other studies

have recorded new cases increasing from 15% (1970) to 56% (2008) and predicting 70% by 2030.^[3]

Most studies in sub-Saharan Africa are hospital based. It has been indicated, in one case-controlled study from South Africa that prostate cancer was associated with a high intake of meat, fat, eggs, eating outside the house and low consumption of vegetables.^[5] If these associations were confirmed as real risks there follows a possibility of reducing prostate cancer by cutting down high fatty foods, increasing intake of vegetables and fruits as well as increasing exercise.^[6] But there are challenges with prostate cancer management especially with late presentations.^[7] Furthermore, clinical diagnosis of prostate cancer is difficult as the presentation is often like BPH. Even though ultrasound, CT and MRI scanning play useful role in diagnosis, Prostatic Specific Antigen (PSA) has a better predictive value.^[8] Many prostate cancers are detected by determining the plasma levels of PSA more than 4 ng/mL.^[6] Nevertheless, men without cancer have also been found with elevated PSA, and therefore a tissue biopsy is usually needed to confirm the diagnosis.^[6]

Prostate cancer is graded using the Gleason Score^[9] that categorises cancerous cells into five distinct patterns. The grading scale ranges from 1 to 5 in which cells closer to 5 are considered high grade.

In 2014, the International Society of Urological Pathology produced a revised prostate cancer grading system known as the Grade Groups. It is very simple in which there are 5 grades ranging from 1 to 5. It comprises of a risk group, grade group and Gleason Score. The risk group is determined by measurements that include PSA level, clinical tumour stage (T-stage), and number of positive biopsy cores. (Table 1).

This Grade Group system was adopted by the WHO Classification of Tumours and Male Genital Organs in 2016.^[10] In 2019 it was agreed to modify the Gleason patterns 4 and 5 to include invasive cribriform carcinoma, intraductal carcinoma and multiparametric MRI targeted biopsies.

There seems to be no hospital-based study published about prostate cancer in South Sudan. WHO reported prostate cancer, in South Sudan, as the third most prevalent cancer and the fifth in terms of cause of death.^[11]

The aim of this study was to define the magnitude of the prostate cancer problem among patients attending a tertiary surgical service in South Sudan and to make recommendations to policy makers.

METHOD

This retrospective study was carried out at Juba Teaching Hospital (JTH), department of Surgery. It has a catchment area within, and outside, Juba City with a population of 440,000 people. The data were extracted from the surgical records and statistical department (1st January 2019 to 31st December 2020). The patients were usually referred from secondary level hospitals, health centres and private clinics. They presented with obstructive prostatic enlargement or incidentally detected by pelvic ultrasound. The PSA was measured when malignant prostatic enlargement was suspected. Most patients with presumed BPH underwent open prostatectomy. The specimens were sent for histopathological analysis and those found to have prostatic carcinoma underwent hormonal management.

Data were collected from males aged forty years and above who presented with urinary retention or otherwise found to have prostatic enlargement. Patients with known prostate cancer were excluded.

The study utilized a stratified random sampling method. A minimum sample size of 101 patients was estimated from the population of 720,000 patients seen yearly in the surgical department. The following formula used to calculate the sample size:

$$n = \frac{N}{1 + N(e)^2}$$

Whereby:

n= Sample size

N= Targeted population

e= Level of precision or confidence interval i.e., 10%

$$n = \frac{720000}{1 + 720000(0.1)^2}$$

$$n = 1 + 100$$

$$= 101 \text{ samples}$$

Table 1. Grade Groups system

Risk Group	Grade Group	Gleason Score
Low/Very Low	Grade Group 1	Gleason Score less or equal 6
Intermediate	Grade Group 2	Gleason Score 7 (3+4)
(Favourable/Unfavourable)	Grade Group 3	Gleason Score 7 (3+4)
High/Very High	Grade Group 4	Gleason Score 8
	Grade Group 5	Gleason 9-10

The data were cleaned by removing data with missing variables in an excel spreadsheet and transferred into SPSS version 21, IBM. Chi-square was used to determine associations between the variables and any result with $p < 0.05$ was considered statistically significant.

Ethical approval was obtained from the Ethical Review Committee of the National Ministry of Health, Republic of South Sudan.

RESULTS

This study involved 101 patients who were diagnosed with presumed BPH and who underwent open prostatectomy. Their ages ranged from 49 to 98 years, mean 68 +/- 9 years. The largest group (37.6%) was aged 71-80 years (Table 2).

Two thirds (66%) presented with urinary retention. Based on the histopathological findings 49.5% had BPH and 28.8% had prostate cancer at various stages with ages ranging from 61-80 years, $p = 0.456$ as shown in Table 3.

DISCUSSION

The incidence rates of prostate cancer are increasing, particularly in limited resource countries like South Sudan. A pooled study from the African Cancer Registry Network^[12] showed a significant rise in prostate cancer incidence in sub-Saharan Africa. More studies are needed to clarify the situation.

Table 2. Distribution of patients according to their age groups, presentation at hospital and their histopathological diagnosis.

Variable	Frequency n (%)	p value
Age group (years)		
41-50	1 (1.0)	0.001
51-60	13 (12.9)	
61-70	36 (35.6)	
71-80	38 (37.6)	
81-90	11 (10.9)	
>90	2 (2.0)	
Histopathological diagnosis		
BPH	50 (49.5)	0.082
BPH with HGPIN	9 (8.9)	
BPH with basal cell hyperplasia	7 (6.9)	
BPH with squamous metaplasia	1(1.0)	
BPH with atrophy	3 (3.0)	
BPH with adenosis	1 (1.0)	
Prostate cancer	29 (28.8)	
Others	1 (1.0)	
Total	101 (100.0)	

Table 3. Distribution of histopathology diagnosis against the age groups of patients

Histopathological Diagnosis	Age group n (%)						Total n (%)
	41-50yrs	51-60yrs	61-70yrs	71-80yrs	81-90yrs	>90yrs	
BPH	0(0)	10(20)	17(34)	15(30)	7(14)	1(2)	50(49.5)
BPH with HGPIN*	0(0)	0(0)	2(22)	6(67)	0(0)	1(11)	9(8.9)
BPH with basal cell hyperplasia	0(0)	1(14)	0(0)	4(57)	2(29)	0(0)	7(6.7)
BPH with squamous metaplasia	0(0)	0(0)	1(100)	0(0)	0(0)	0(0)	1(1)
BPH with atrophy	0(0)	0(0)	3(100)	0(0)	0(0)	0(0)	3(3)
BPH with adenosis	0(0)	0(0)	1(100)	0(0)	0(0)	0(0)	1(1)
Prostate cancer	1(3.4)	2(6.9)	11(37.9)	13(44.8)	2(6.9)	0(0)	29(28.7)
Others	0(0)	0(0)	1(100)	0(0)	0(0)	0(0)	1(1)
Total							101

$p=0.456$

*High-grade Prostatic Intraepithelial Neoplasia

The cause of the increasing incidence of prostate cancer in Eastern Africa is multifactorial with improvement in the record keeping within health systems being a key factor. The commonest presentation is with urinary retention but chronic urine tract infection also occurred. The prevalence of BPH in sub-Saharan Africa varies from 12% to 42%.^[13]

Our finding (49.5%) was higher probably because the study was hospital based. BPH is suspected if a patient presents with a lower obstructive uropathy syndrome^[14]: nocturia, dysuria, urgency, frequency, difficulty initiating micturition and emptying the bladder, and weak or interrupted stream in absence of urethral stricture.^[15] In our study 66% of the patients were diagnosed on the basis of symptoms as having BPH. Our high finding could be due to multiple factors: delayed presentation by patients, poor referral practice, inadequate infrastructure, and qualified health staff. Prostate cancer mostly affects men over 70 years^[16] (average age of 74 years). We had a similar finding with the age group 61 to 80 years being most often affected.

CONCLUSION

This study has indicated that prostate cancer is a significant problem especially in men aged 61-80 years. The high prevalence may be attributed to lack of awareness, delayed referral, transport issues, and late diagnosis, poor infrastructure, inadequate qualified health professionals and insecurity.

Limitations

1. This was a single-centred hospital-based study.
2. High cost and scarcity of PSA.
3. Missing patients' data.

RECOMMENDATIONS

1. Creation of a national cancer registry.
2. Development of a national strategic plan for prostate cancer.
3. Development of guidelines for management and health education for prostate cancer.
4. Provision of resources to fund research on prostate and other malignancies.

Conflict of interests: None

Authors contribution: MA developed research from inception, data collection to first draft of the manuscript. KS and JL did the statistical analysis, results formulation, finalization and editing of the manuscript. GN and JT did proof reading of the manuscript. All authors read and approved the final manuscript.

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