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A Panorama of the Urological Diseases at the Former Military Teaching Hospital of Cotonou

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Abstract

Background: Urological care has been advancing quickly over the last ten years in Benin. In order to conveniently support that trend towards better urological care standards, decision-makers need sound data on urological diseases in the country. **Objective:** To determine the prevalence of urological diseases in the former Military Teaching Hospital of Cotonou. **Patients and Method:** We retrospectively collected the urological diseases that the institution had managed from January 2012 to December 2020. We used Excel© 2010 and SPSS© to analyze the collected data. **Results:** 4244 patients, *i.e.* 3717 males (87.58%) and 527 females (12.42%) were managed during the study period. The main diseases diagnosed were benign prostatic hyperplasia (32.61%, n = 1384), erectile dysfunction (10.44%, n = 443), chronic prostatitis (5.94%, n = 252), prostate cancer (4.03%, n = 171), and ejaculatory disorders (3.44%, n = 146). In patients ≤ 15 years, predominant diseases were peritoneal vaginal canal (15.9%, n = 43), circumcision (15.6%, n = 42), testicular dystopia (10.7%, n = 29), hydrocele (7.8%, n = 21), and hypospadias (5.6%, n = 15). Wilms tumor (1.9%, n = 5) was the first cancer, testicular (0.4%, n = 1) and para-testicular (0.4%, n = 1) tumors were the next. In patients > 15 and ≤40 years, the main diseases were infertility (14.1%, n = 189), chronic prostatitis (12.9%, n = 173), erectile dysfunction (10.1%, n = 135), ejaculatory disorders (6.2%, n = 83), genital infections (6.2%, n = 83) and urinary stone (4.9%, n = 66). The first cancer was kidney cancer (0.97%, n = 13) followed by bladder cancer (0.3%, n = 4) and testicular tumor (0.3%, n = 4). In patients >40 years, the most prevalent diseases were BPH (52.0%, n = 1370), erectile dysfunction (11.7%, n = 308), prostate cancer (6.5%, n = 171), inguinal hernia (5.1%, n = 134), and urinary stone (3.9%, n = 102). Prostate cancer is the first cancer; the next were bladder (0.95%, n = 25) and kidney (0.68%, n = 18) cancers. **Conclusion:** Benign prostatic hyperplasia and urological cancers (prostate, bladder

and kidney cancers) were the main urological diseases at the former Military Teaching Hospital of Cotonou. Urological malformations and Wilms tumor were the main diseases in the children.

1. Introduction

The former military teaching hospital of Cotonou settled its urological department in January 2012. It was the first military urological care unit and the second ever created in Benin. In 2013, the military teaching hospital of Cotonou was the first healthcare facility to introduce the TRUS-guided prostate biopsy in the country [1]. In 2014, the hospital performed its first radical prostatectomy and introduced in the country, the transurethral resection of prostate and bladder. In the same year 2014, the facility performed its first radical cystectomy. These last years, urological care has been both modernizing and extending to more and more geographical areas. To efficaciously further that trend, there is a need to characterize the epidemiology of urological diseases in the country. Evaluating the ten-year-long urological care of the former military teaching hospital of Cotonou can help to meet that need.

2. Objective

To determine the prevalence of urological diseases in the former Military Teaching Hospital of Cotonou.

3. Patients and Method

We retrospectively studied the diseases managed from January 2012 to December 2020 in the urological department of the former military teaching hospital of Cotonou. We collected the diseases, the number of cases of each disease and the demographic data of the affected patients. We excluded cases in which the diagnosis was unclear or non-urological or the cases in which the patient demographic data were not available. We analyzed the collected data by means of Excel© and SPSS©. We calculated the prevalence of each recorded disease in the whole population of patients. Then we studied the diseases and their prevalence in the children (patients aged 15 years or less), the young adults (aged from 15 to 40 years or less) and the adults (patients above 40 years old). In the patients older than 40 years, we further analyzed the disease prevalence through age subgroups and compared the prevalence of prominent diseases between those age subgroups. Doing so leads us to the results below.

4. Results

4244 patients were studied including 3717 males and 527 females. Among them

were 270 children (≤15 years old), 1341 young adults (aged 15 to 40 years) and 2633 adults (>40 years old). Their demographic data are exposed in Table 1.

The main diseases diagnosed in the patients were benign prostatic hyperplasia (32.61%, n = 1384), erectile dysfunction (10.44%, n = 443), chronic prostatitis (5.94%, n = 252), prostate cancer (4.03%, n = 171), ejaculatory disorders (3.44%, n = 146). The spectrum of urological disease observed varied from childhood to adulthood (Table 2).

Predominant diseases in patients aged 15 years or less were peritoneal vaginal canal (15.9%, n = 43), circumcision (15.6%, n = 42), testicular dystopia (10.7%, n = 29), hydrocele (7.8%, n = 21), hypospadias (5.6%, n = 15). The first cancer in the children was Wilms tumor (1.9%, n = 5). The other childhood tumors were testicular (0.4%, n = 1) and para-testicular (0.4%, n = 1) tumors.

In young adults, *i.e.* individuals 15 to 40 years old, the main diseases were infertility (14.1%, n = 189), chronic prostatitis (12.9%, n = 173), erectile dysfunction (10.1%, n = 135), ejaculatory disorders (6.2%, n = 83), genital infections (6.2%, n = 83) and urinary stone (4.9%, n = 66). The first cancer in that age group was kidney cancer (0.97%, n = 13) followed by bladder cancer (0.3%, n = 4) and testicular tumor (0.3%, n = 4).

In patients older than 40 years (Table 2 and Table 3), the most prevalent diseases were BPH (52.0%, n = 1370), erectile dysfunction (11.7%, n = 308), prostate cancer (6.5%, n = 171), inguinal hernia (5.1%, n = 134), urinary stone (3.9%, n = 102). Here, prostate cancer is the first cancer; the next cancers were bladder cancer (0.95%, n = 25), kidney cancer (0.68%, n = 18), adrenal tumor (0.19%, n =

Table 1. Demographic characteristics of the patients.

Patients	Sex		Total
	Male	Female	
Population			
Size n (%)	3717 (87.6)	527 (12.4)	4244
Number (%) of patients			
≤15 years	237 (87.8)	33 (12.2)	270 (6.4)
15 to 40 years	1142 (85.2)	199 (14.8)	1341 (31.6)
≥40 years	2338 (88.8)	295 (11.2)	2633 (62.0)
Age (years)			
Mean	47.4	43.3	46.9
Min.	0.5	1	0.3
Max.	102	95	102
Mean age of patients			
≤15 years	7.1	8.6	7.3
15 to 40 years	30.2	29.4	30.1
≥40 years	59.9	56.6	59.6

Table 2. Diseases and their prevalence in the whole population of patients.

AGE GROUPS (YEARS)					
AGE ≤ 15 YEARS (n = 270)		**15 < AGE ≤ 40 (n = 1341)**		**AGE > 40 (n = 2633)**	
DISEASES	PREVALENCE % (n)	DISEASES	PREVALENCE % (n)	DISEASES	PREVALENCE % (n)
Peritoneal-vaginal canal	15.93 (43)	Infertility	14.09 (189)	BPH	52.03 (1370)
Circumcision	15.56 (42)	Chronic prostatitis	12.9 (173)	Erectile dysfunction	11.7 (308)
Testicular dystopia	10.74 (29)	Erectile dysfunction	10.07 (135)	*Prostate cancer*	**6.49 (171)**
Hydrocele	7.78 (21)	Ejaculatory disorders	6.19 (83)	Inguinal hernia	5.09 (134)
Hypospadias	5.56 (15)	Genital infections	6.19 (83)	Urinary stone	3.87 (102)
Cystitis	2.96 (8)	Urinary stone	4.92 (66)	Renal cyst	3.84 (101)
Inguinal hernia	2.22 (6)	Varicocele	4.92 (66)	OAB	3.42 (90)
Enuresis	2.22 (6)	Cystitis	3.06 (41)	Chronic prostatitis	3.00 (79)
Wilms tumor	**1.85 (5)**	Inguinal hernia	2.61 (35)	DESD	2.96 (78)
Paraphimosis	1.85 (5)	Urethral stenosis	2.09 (28)	Infertility	2.66 (70)
Priapism	1.85 (5)	Hydrocele	1.86 (25)	Ejaculatory disorders	2.39 (63)
Testicular torsion	1.48 (4)	Venereal warts	1.79 (24)	Cystitis	2.2 (58)
Varicocele	1.11 (3)	OAB	1.57 (21)	Acute genital infection	2.16 (57)
Testicular agenesis	1.11 (3)	DESD	1.34 (18)	Obstructive renal failure	1.94 (51)
UPJO	1.11 (3)	BPH	1.04 (14)	Urethral stenosis	1.52 (40)
DESD	0.74 (2)	*Kidney cancer*	**0.97 (13)**	Hydrocele	1.48 (39)
Obstructive renal failure	0.74 (2)	Epididymal cyst	0.97 (13)	*Bladder cancer*	**0.95 (25)**
Spermatic cord cyst	0.74 (2)	Testicular dystopia	0.82 (11)	CKD	0.95 (25)
OAB	0.37 (1)	Renal cyst	0.74 (10)	*Kidney cancer*	**0.68 (18)**
Testicular tumor	**0.37 (1)**	Acute pyelonephritis	0.45 (6)	Varicocele	0.53 (14)
Para-testicular tumor	**0.37 (1)**	Testicular torsion	0.45 (6)	Acute pyelonephritis	0.3 (8)
Kidney trauma	0.37 (1)	Enuresis	0.37 (5)	Peyronie disease	0.3 (8)
Kidney ectopia	0.37 (1)	Priapism	0.37 (5)	POP	0.3 (8)
		Spermatic cord cyst	0.37 (5)	Epididymal cyst	0.27 (7)
		Ectopic kidney	0.37 (5)	*Adrenal tumor*	**0.19 (5)**
		Bladder cancer	**0.3 (4)**	UPJO	0.19 (5)
		Testicular tumor	**0.3 (4)**	Kidney ectopia	0.19 (5)
		CKD	0.3 (4)	*Testicular tumor*	**0.15 (4)**
		Testicular agenesia	0.3 (4)	Venereal warts	0.15 (4)

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Ureteral stenosis	0.3 (4)	SUI	0.15 (4)
Peritoneal-vaginal canal	0.22 (3)	Breast cancer	0.11 (3)
Penile fracture	0.22 (3)	Vesical-vaginal fistula	0.11 (3)
UPJO	0.22 (3)	Acute renal failure	0.11 (3)
Circumcision	0.15 (2)	UG schistosomiasis	0.08 (2)
Para-testicular tumor	**0.15 (2)**	Priapism	0.08 (2)
Adrenal tumor	**0.07 (1)**	Penile fracture	0.08 (2)
UG schistosomiasis	0.07 (1)	Hypospadias	0.08 (2)
POP	0.07 (1)	Ureteral stenosis	0.08 (2)
Obstructive renal failure	0.07 (1)	Testicular torsion	0.04 (1)
Vesical-vaginal fistula	0.07 (1)	Testicular agenesis	0.04 (1)
Hypospadias	0.07 (1)	Spermatic cord cyst	0.04 (1)
Peyronie disease	0.07 (1)	Kidney trauma	0.04 (1)

5) and testicular tumor (0.15%, n = 4).

Below 60 years, the most prevalent diseases were BPH (40.9%, n = 588), erectile dysfunction (13.6%, n = 195), urinary stone (5.4%, n = 77), chronic prostatitis (5.1%, n = 74), inguinal hernia (4.1%, n = 59) and ejaculatory disorders (3.5%, n = 50). Prostate cancer (2.2%, n = 31), kidney cancer (0.7%, n = 10), bladder cancer (0.6%, n = 8) and testicular tumor (0.2%, n = 3) were the main cancers.

In 60 to 80 years old patients, BPH (65.9%, n = 729), prostate cancer (11.2%, n = 124), erectile dysfunction (10.0%, n = 111), inguinal hernia (6.2%, n = 69) and kidney cyst (5.7%, n = 63) were predominant. Prostate cancer (11.2%) was the first cancer tailgated by bladder (1.5%, n = 17) and kidney (0.7%, n = 8) cancers.

In patients above 80 years of age, the most prevalent diseases were BPH (59.3%, n = 53), prostate cancer (18.6%, n = 16), obstructive renal failure (9.3%, n = 8), inguinal hernia (7%, n = 6) and renal cyst (5.8%, n = 5). The only cancer in them was prostate cancer.

The difference in BPH prevalence was significant between the subgroups 60 to 80 years and 40 to 60 years (p = 0.003) and between the subgroups 80 to 100 years and 40 to 60 years (p = 0.002). The difference in prostate cancer prevalence was not significant between the subgroups 60 to 80 years and 80 to 100 years (p = 0.12).

5. Discussion

The collected data clearly drew a global epidemiologic picture of the diseases that were managed in the urological department of the hospital. In the whole

Table 3. Diseases and their prevalence in subgroups of patients >40 years of age.

AGE SUBGROUPS (YEARS)					
40 < AGE ≤ 60 (n = 1439)		60 < AGE ≤ 80 (n = 1106)		80 < AGE ≤ 100 (n = 86)	
DISEASES	PREVALENCE % (n)	DISEASES	PREVALENCE % (n)	DISEASES	PREVALENCE % (n)
BPH	40.9 (588)	BPH	65.9 (729)	BPH	59.3 (53)
Erectile dysfunction	13.6 (195)	*Prostate cancer*	**11.2 (124)**	*Prostate cancer*	**18.6 (16)**
Urinary stone	5.4 (77)	Erectile dysfunction	10.0 (111)	*Obstructive renal failure*	9.3 (8)
Chronic prostatitis	5.1 (74)	Inguinal hernia	6.2 (69)	*Inguinal hernia*	7 (6)
Infertility	4.5 (65)	Kidney cyst	5.7 (63)	Renal cyst	5.8 (5)
Inguinal hernia	4.1 (59)	OAB	3.6 (40)	DESD	4.7 (4)
Ejaculatory disorders	3.5 (50)	DESD	2.5 (28)	OAB	2.3 (2)
OAB	3.3 (48)	Urinary stone	2.2 (24)	Erectile dysfunction	2.3 (2)
DESD	3.2 (46)	Obstructive renal failure	2 (22)	Acute orchitis	2.3 (2)
Cystitis	2.6 (37)	Genital infection	1.9 (21)	POP	2.3 (2)
Genital infections	2.4 (34)	Cystitis	1.8 (20)	Anejaculation	2.3 (2)
Kidney cyst	2.3 (33)	Hydrocele	1.8 (20)	Urinary stone	1.2 (1)
Prostate cancer	2.2 (31)	*Bladder cancer*	**1.5 (17)**	Cystitis	1.2 (1)
Urethral stricture	1.5 (22)	Urethral stricture	1.5 (17)	Urethral stenosis	1.2 (1)
Obstructive renal failure	1.5 (21)	Ejaculatory disorders	1 (11)	Hydrocele	1.2 (1)
Hydrocele	1.3 (18)	CKD	1 (11)		
CKD	1 (14)	*Kidney cancer*	**0.7 (8)**		
Varicocele	0.8 (12)	Infertility	0.5 (5)		
Kidney cancer	0.7 (10)	Chronic prostatitis	0.5 (5)		
Bladder cancer	0.6 (8)	POP	0.4 (4)		
Acute pyelonephritis	0.4 (6)	Venereal warts	0.4 (4)		
Epididymal cyst	0.4 (6)	Acute pyelonephritis	0.2 (2)		
Peyronie disease	0.4 (6)	Varicocele	0.2 (2)		
Adrenal tumor	0.3 (4)	Acute renal failure	0.2 (2)		
UPJO	0.3 (4)	Peyronie disease	0.2 (2)		
Kidney ectopia	0.3 (4)	*Testicular tumor*	**0.1 (1)**		
Testicular tumor	0.2 (3)	*Adrenal tumor*	**0.1 (1)**		
SUI	0.2 (3)	*Male Breast cancer*	**0.1 (1)**		
UG schistosomiasis	0.1 (2)	Penile fracture	0.1 (1)		
POP	0.1 (2)	Vesical-vaginal fistula	0.1 (1)		

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Priapism	0.1 (2)	UPJO	0.1 (1)
Vesical vaginal fistula	0.1 (2)	Epididymal cyst	0.1 (1)
Penile fracture	0.07 (1)	Hypospadias	0.1 (1)
Testicular torsion	0.07 (1)	SUI	0.1 (1)
Testicular agenesis	0.07 (1)	Kidney ectopia	0.1 (1)
Cyst of spermatic cord	0.07 (1)	Ureteral stricture	0.1 (1)
Kidney trauma	0.07 (1)		
Acute renal failure	0.07 (1)		
Hypospadias	0.07 (1)		
Ureteral stricture	0.07 (1)		

population of patients, the most prevalent urological diseases were prostate diseases, *i.e.* BPH, chronic prostatitis and prostate cancer, accounting for 42.6%. Next came erectile dysfunction (10.4%) and ejaculatory disorders (3.4%). The most prevalent cancer was prostate cancer (4.0%). Mungadi has also noticed that prostate diseases, *i.e.* BPH, prostate cancer and chronic prostatitis are predominant and make up 26.5% of all urological diseases [2]. Prostate cancer is the most common non-cutaneous cancer and the 2nd cause of cancer death in males [3] [4]. Nevertheless, the disease spectrum in our patients varied throughout their age groups.

In children, *i.e.* patients aged 15 years or less, malformations (peritoneal vaginal canal, testicular dystopia, hypospadias) were the main diseases (32.2%) and Wilms tumor, the first cancer (1.9%). Wilms tumor or nephroblastoma (7.5%), cryptorchidism (39.2%) and hypospadias (3.7%) are the main diseases in pediatric population [5].

In young adults (15 to 40 years old), the main issues were sexual and reproductive disorders (30.4%), chronic prostatitis and genital infections (19.1%) and urinary stone (4.9%). Cancers were rare (1.34%), the most prevalent was kidney cancer (0.97%). Lotti has noticed 12% of infertility, 8.9% to 68.7% of cases being associated with erectile dysfunction and premature ejaculation [6].

In adults (more than 40 years old), prostate diseases (*i.e.* BPH, prostate cancer and chronic prostatitis) were the most prevalent, accounting for 61.5%. Prostate cancer (6.5%) was on top of the cancers. Nevertheless, the disease prevalence was heterogeneous throughout subgroups of patients older than 40 years (Table 3). BPH prevalence was highest between 60 and 80 years. The difference in BPH prevalence was significant between the age subgroups 40 to 60 and 60 to 80 (p = 0.003) and between 40 to 60 and 80 to 100 years (p = 0.002). Prostate cancer prevalence increased from one age subgroup to the other although that increment was not significant between the age subgroups 60 to 80 and 80 to 100 years (p = 0.12).

6. Conclusion

Benign prostatic hyperplasia and urological cancers were the main urological diseases at the former Military Teaching Hospital of Cotonou. Urological malformations were the main disease in the children. The main malignancies in the adults were prostate, bladder and kidney cancers. The main malignancy in the children was Wilms tumor.

Limitations of the Study

This one-institution-based study of urological diseases might not reveal the actual prevalence of those diseases in the country's population. Still, the prevalence data obtained were sound as the patients managed in the Urological Department of the Former Military Teaching Hospital of Cotonou came from all parts of the Country.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Sossa, J. and Avakoudjo, D.J.G. (2021) The Prevalence and Pathological Characteristics of the Prostate Cancer in 138 Consecutive Transrectal Ultrasonography-Guided Prostate Biopsies. *SAS Journal of Surgery*, **7**, 558-561.

[2] Mungadi, I.A. and Khalid, A. (2021) Spectrum of Urological Cases in a West African Tertiary Hospital. *Annals of African Medicine*, **20**, 14-18. https://doi.org/10.4103/aam.aam_7_20

[3] Siegel, R.L., Miller, K.D. and Jemal, A. (2022) Cancer Statistics, 2022. *CA*: *A Cancer Journal for Clinicians*, **72**, 7-33. https://doi.org/10.3322/caac.21708

[4] American Cancer Society (2023) Cancer Facts and Statistics. http://www.cancer.org/docroot/STT/stt_0.asp

[5] Agossou-Voyeme, A.K., Fiogbe, M.A., Goundete, J., Hounnou, G.M. and Hodonou, R. (2013) Paediatric Urologic Pathologies at the National Teaching Hospital in Cotonou: An Etiological and Therapeutic Aspects. *African Journal of Paediatric Surgery*, **10**, 135-139.

[6] Lotti, F. and Maggi, M. (2018) Sexual Dysfunction and Male Infertility. *Nature Reviews Urology*, **15**, 287-307. https://doi.org/10.1038/nrurol.2018.20