Spectrum of Urological Cases in a West African Tertiary Hospital

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Abstract

Context: Urological diseases vary from one geographical location to another worldwide. The knowledge of their distribution in each location could determine local workforce and facility needs and as well guide the areas of subspecialization. Aims: The aim of this study is to document the annual frequency and distribution of urological diseases at the Usmanu Danfodiyo University Teaching Hospital, Sokoto. Settings and Design: A cross-sectional retrospective study from January 2016 to December 2016 of all new patients seen at the urology outpatient clinic, emergency department as well as inpatient referrals from other departments of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. Materials and Methods: The relevant records were extracted from the patient’s case notes and entered into a semistructured questionnaire. Statistical Analysis Used: Data were analyzed using the SPSS software version 20. Results: A total of 607 new patients were seen over the study period. There were 576 (94.9%) males and 31 (5.1%) females, with a male-to-female ratio of 18.6:1. The median age was 45 years, with age range of 1–106 years. Urological emergencies were seen in 35.0% patients. Ninety-one percent of cases were acquired, whereas 8.2% were of congenital etiology. Overall, the most commonly diagnosed urologic diseases among new patients in order of decreasing frequency were benign prostatic enlargement (BPE) (18.6%), bladder tumor (11.8%), upper tract urinary calculi (10.3%), urethral stricture (8.9%), and prostate adenocarcinoma (7.4%). Conclusions: BPE, bladder tumor, upper tract urinary calculi, urethral stricture, and prostate adenocarcinoma are common in our environment. Knowledge of these diseases distribution may guide service expansion and workforce needs, inspire subspecialization as well as direct research and government policy in this community. Nongovernmental organizations wanting to have impact will be suitably directed.

Keywords: African urology, benign prostatic enlargement, bladder tumor, prostate adenocarcinoma, urethral stricture, urinary calculi

Résumé

Le contexte: Les maladies urologiques varient d’une zone géographique à une autre dans le monde. La connaissance de leur répartition dans chaque site pourrait déterminer les besoins locaux en main-d’œuvre et en installations et guider les domaines de sous-spécialisation. Objectifs: Documenter la fréquence annuelle et la distribution des maladies urologiques à l’hôpital universitaire de Usmanu Danfodiyo, Sokoto. Paramètres et Conception: Une étude rétrospective transversale de janvier 2016 à décembre 2016 de tous les nouveaux patients vus à la clinique externe d’urologie, au service des urgences ainsi que les références hospitalières d’autres départements de l’hôpital universitaire Usmanu Danfodiyo (UDUTH), Sokoto, Nigéria. Méthodes et Matériel: Les dossiers pertinents ont été extraits des notes de cas des patients et entrés dans un questionnaire semi-structuré. Analyse Statistique Utilisée: Les données ont été analysées à l’aide de SPSS version 20. Résultats: Au total, 607 nouveaux patients ont été vus au cours de la période d’étude. Il y avait 576 hommes (94,9%) et 31 femmes (5,1%) avec un ratio hommes/femmes de 18,6:1. L’âge médian était de 45 ans avec une tranche d’âge de 1 à 106 ans. Des urgences urologiques ont été observées chez 35,0% des patients. Quatre-vingt-onze pour cent des cas ont été acquis tandis que 8,2% étaient d’étiologie congénitale. Dans l’ensemble, les maladies urologiques les plus fréquemment diagnostiquées chez les nouveaux patients par ordre décroissant de fréquence étaient une hypertrophie bénigne de la prostate. Conclusions: Les maladies urologiques les plus fréquemment diagnostiquées sont la BPE (18,6%), le cancer bladaire (11,8%), les calcaires de la voie urinaire supérieure (10,3%), la striction de l’urètre (8,9%) et le cancer de la prostate (7,4%). Les organisations non gouvernementales souhaitant avoir un impact seront correctement orientées.
Introduction

Urologic diseases place significant medical and socioeconomic burden on patients presenting to primary, secondary, and tertiary-care providers who practice in resource-constrained environment. These conditions often cut across all age and gender. Their distributions vary from one geographical location to another worldwide. The variation is influenced by a number of factors, including but not limited to, namely, age, sex, sociocultural practices, genetic predisposition, climatic, occupational, and environmental conditions. The knowledge of the distribution of these conditions is vital to successful service delivery, need for training, and retraining as well as research in our practice location. It can also have an impact on the workforce and facility needs and as well guide the areas of future subspecialization. Sokoto is one of the hottest cities located in the north-western part of Nigeria, especially in the months of February to April. This weather condition can lead to excessive sweating and consequently dehydration which in addition to other factors predisposes to urinary calculi formation. To our knowledge, the annual distribution of urologic diseases in this environment has not been documented. Earlier studies done in North-western Nigeria reviewed the picture of a few urologic conditions such as bladder and prostate cancer. There is a need to have a more encompassing database of the commonly encountered urologic conditions seen in our practice. A study of these urological ailments will facilitate deduction of useful inference which may enhance capacity building and patients care delivery. These findings may direct policies regarding facility expansions and upgrade as well as staff capacity development. The objective of this study is to document and establish the baseline database on the annual distribution of urologic diseases in our environment with the hope of drawing attention and guiding policy decisions as they relate to urologic service delivery.

Materials and Methods

This is a cross-sectional, descriptive, retrospective review of all new patients seen from January 2016 to December 2016 at the Urology Outpatient Clinic, Emergency Department as well as inpatient referrals from other departments of Usman Danfodiyo University Teaching Hospital, Sokoto, Nigeria. The relevant information obtained from the patient’s case notes included patient’s age, sex, clinical, laboratory, radiological, histopathological and where applicable therapeutic data for case etiologic and diagnostic categorization. The data collection were done using a semi-structured questionnaire and Microsoft Excel, and then exported to SPSS, version 20.0 (IBM Corp, Armonk, NY) for the analysis. The results are presented in simple frequency tables and percentages.

Results

A total of 607 new patients were seen over the study period. There were 576 (94.9%) males and 31 (5.1%) females, with a male-to-female ratio of 18.6:1. The median age was 45 years, with age range of 1–106 years. Majority of the patients, 107 (17.6%) were between the ages of 51 to 60 years, whereas only 2 (0.3%) patients were above the age of 100 years representing the least age group. There was a bimodal peak age of presentation at 21–40 years and 51–70 years representing 185 (30.2%) and 177 (31.2%) of patients, respectively, as shown in Figure 1. Elective urological presentations accounted for the majority of cases 397 (65.4%), whereas urological emergencies were seen in 210 (34.6%) patients. Ninety-one percent of cases were acquired, whereas 8.2% were of congenital etiology.

Out of the 607 new patients seen over the study period, benign prostatic enlargement (BPE), bladder tumor, upper tract urinary calculi, urethral stricture, and prostate adenocarcinoma accounted for 18.6%, 11.8%, 10.3%, 8.9%, and 7.4% of cases, respectively. Thus, making them the five commonly diagnosed urologic diseases. The less commonly diagnosed urologic diseases include infertility, urethral obstruction postschistosomal infestation, hypospadias, acute scrotum, varicocele, and erectile dysfunction accounted for 4.2%, 3.6%, 3.0%, 2.8%, 1.8%, and 1.6% of cases, respectively. The grouping of urological diseases in this study based on their organs of origin is shown in Table 1.

Prostatic diseases

Diseases of the prostate constitute majority of urological conditions seen during the period of study accounting for 116 (26.5%) of new patients. These include BPE in 113 (70.2%), prostate adenocarcinoma in 45 (28.0%), and chronic prostatitis in 3 (1.9%) of prostatic diseases.
The spectrum of bladder diseases of the study period was bladder tumor in 72 (60.5%), chronic schistosomiasis in 12 (10.1%), bladder stone in 8 (6.7%), neurogenic bladder in 7 (5.9%), bladder extrophy in 3 (2.5%), bladder injury in 3 (2.5%), bladder neck stenosis in 3 (2.5%), and miscellaneous conditions or others bladder conditions such as recurrent cystitis, overactive bladder, and retained catheter with encrustation in 11 (9.2%) patients.

The annual distribution of urethral diseases, ureteral diseases, and kidney diseases is summarized in Tables 2-4.

The annual distribution of testicular, scrotal, penile, and miscellaneous diseases as observed in this study is summarized in Table 5.

**DISCUSSION**

Sokoto is an ancient city in north-western Nigeria, a sub-Saharan country of Africa. It lies in the Rima Basin area between latitude 12°15’ 29” North of the equator and longitude 13° 58’ 22” East of the Greenwich meridian, and it is situated at elevation 296 meters above the sea level. Sokoto is one of the hottest cities in the world, with an annual average temperature of 28.3°C. Its maximum daytime temperatures are most of the year generally under 40°C, but the dryness makes the heat bearable. The warmest months are February to April, where daytime temperatures can exceed 45°C. Given the weather, it is expected that climate-dependent urologic diseases such as urinary stone diseases would vary from those seen in areas with high temperatures as opposed to areas with low temperatures. Because the high temperatures will cause excessive sweating and dehydration which will in addition to other factors predispose to urinary stone formation, especially if water intake is not adequate.

The preponderance of male patients in our study is consistent with previous studies conducted in the subregions. This may partly be because the urologist manages genital and urinary tract diseases in male patients as opposed to mainly urinary tract diseases in females.

**Table 1: Annual distribution of etiomorphology of urological diseases**

| Etiomorphology | Frequency (%) |
|----------------|---------------|
| Prostate       | 161 (26.5)    |
| Bladder        | 119 (19.6)    |
| Urethra        | 99 (16.3)     |
| Ureter         | 72 (11.9)     |
| Kidney         | 45 (7.4)      |
| Testis         | 32 (5.3)      |
| Scrotum        | 22 (3.6)      |
| Penile         | 22 (3.6)      |
| Miscellaneous  | 35 (5.8)      |
| Total          | 607 (100.0)   |

**Table 2: Annual distribution of urethral diseases**

| Urethral diseases | Frequency (%) |
|-------------------|---------------|
| Postinflammatory urethral stricture | 36 (36.4) |
| Posttraumatic urethral stricture    | 18 (18.2) |
| Hypospadias           | 18 (18.2) |
| Urethral stone         | 9 (9.1)    |
| Meatal stenosis        | 3 (3.0)    |
| Phimosis               | 4 (4.0)    |
| Urethrocutaneous fistula | 2 (2.0) |
| Ureteric injury        | 2 (2.0)    |
| PUV                   | 2 (2.0)    |
| Others                | 4 (4.0)    |
| Total                 | 99 (100.0)  |

PUV=Posterior urethral valve, Others=Include urethral wart, urethral diverticulum, epididymis, and urethrits

**Table 3: Annual distribution of ureteral diseases**

| Ureteral diseases | Frequency (%) |
|-------------------|---------------|
| Ureteric calculus | 33 (45.8)     |
| Ureteral obstruction postschistosomal infestation | 22 (30.6) |
| Ureteric obstruction of unknown etiology | 13 (18.1) |
| Ureteric obstruction from retroperitoneal fibrosis | 2 (2.8) |
| Iatrogenic ureteral obstruction | 1 (1.4) |
| Ureteric obstruction from cystocele | 1 (1.4) |
| Total             | 72 (100.0)    |

**Table 4: Annual distribution of kidney diseases**

| Kidney diseases | Frequency (%) |
|-----------------|---------------|
| Kidney stone    | 30 (66.7)     |
| Kidney tumor    | 6 (13.3)      |
| Kidney cyst     | 4 (8.9)       |
| Ectopic kidney  | 3 (6.7)       |
| Horse-shoe kidney | 1 (2.2) |
| Renal injury    | 1 (2.2)       |
| Total           | 45 (100.0)    |
**Table 5: Annual distribution of testicular, scrotal, penile, and miscellaneous diseases**

| Diseases                                                                 | Frequency (%) |
|--------------------------------------------------------------------------|---------------|
| Acute scrotum                                                            | 17 (56.7)     |
| Testicular atrophy                                                       | 10 (33.3)     |
| Testicular tumor                                                         | 1 (3.3)       |
| Undescended testis                                                       | 3 (6.7)       |
| Total                                                                    | 31 (100)      |
| Varicocele                                                               | 11 (47.8)     |
| Fournier’s gangrene                                                      | 6 (26.1)      |
| Hydrocele                                                                | 4 (17.4)      |
| Traumatic scrotal ulcer                                                  | 1 (4.3)       |
| Undescended testis                                                       | 1 (4.3)       |
| Total                                                                   | 23 (100.0)    |
| Erectile dysfunction                                                      | 10 (45.5)     |
| Peyronie’s disease                                                       | 3 (13.6)      |
| Circumcision penile injury                                               | 2 (9.1)       |
| Priapism                                                                | 2 (9.1)       |
| Intact prepuc                                                                 | 2 (9.1)      |
| Penile fracture                                                          | 1 (4.5)       |
| Penile warts                                                            | 1 (4.5)       |
| Traumatic penile amputation from grinding engine                         | 1 (4.5)       |
| Total                                                                   | 22 (100.0)    |
| Primary infertility                                                      | 22 (62.9)     |
| Secondary infertility                                                    | 4 (11.4)      |
| DSD                                                                     | 5 (14.3)      |
| Others                                                                  | 4 (11.4)      |
| Total                                                                   | 35 (100.0)    |

DSD=Disorders of sex differentiation, Others/miscellaneous diseases=Perineal abscess, prune belly syndrome with vesico-umbilical fistula and retrograde ejaculation

The median age of the study population was 45 years. This is close to the mean age of 50.1 (±23.3) years observed in a study conducted at a dedicated urology facility in the capital city of the most populous state of our region.[18] Majority of the patients were between 51 and 60 years, which is in variance with aforementioned study which recorded 61–70 years as the modal age of their patients.[19] However, the age ranges characterize the age of presentation of BPE and prostate cancers which are leading diseases seen in our environment. The bulk of study population fell into two bimodal peak ages of presentation with the first peak lying between 21 and 40 years, whereas the second peak between 51 and 70 years. This striking observation can be explained by the younger age of presentation of bladder cancer patients in our schistosomal endemic location compared with what is generally observed globally.[19–21] According to earlier study by Mungadi and Malami,[19] it was demonstrated that the mean age of bladder cancer patient was 46 years with age range of 20–85 years and living in schistosomal endemic locations. The second peak age coincides with the period when prostatic diseases mainly BPE and prostate cancer are common.[22–24]

Elective urological presentations are the commonly encountered trend of urologic patients as observed in this study accounting for 65.4% of the cases. On the contrary, the unexpectedly high urological emergency of 34.6% of new patients may raise some concern when compared to the documented trend in the literature.[25] The possible explanation may be that our patients often present with complications of their background urologic ailments such as anemia, renal failure, urinary retention, and urosepsis as a result of delay in decision to seek intervention.[26] The delay may be because our patients are predominantly farmers who form the bulk of the family workforce, a good number of whom are not covered by the National Health Insurance Scheme, and therefore have to pay for care out-of-pocket leading to delays in presentation.

The ninety-one percent of acquired cases of urologic diseases seen in this study, though high, may be a reflection of the general trend of urologic diseases as may be obtained anywhere in the world.[27] However, the low proportion of 8.2% of urologic conditions of congenital etiology can be as a result of their rare occurrence. Furthermore, the records of this cohort of patients were kept separately at a different section of the facility. This posed technical and logistic challenge during this particular study. Hence, there is an urgent need to look into this aspect for the purpose of future studies to avoid missing data during subsequent research studies.

In general, the most commonly diagnosed urologic disease among new patients was BPE seen in 18.62%. Our finding is similar to the Kano study whereby benign prostatic hyperplasia led the diagnosis among inpatients seen in 44.24% of the patients.[15] As the life expectancy of our people increase with improved living conditions, more men will be expected to live beyond 50 years when LUTS from prostatic diseases predominate.[28] Bladder tumor was the second leading cases of urologic ailments in 11.86% new patients as opposed to earlier study in the region which found urethral stricture as the second leading cause of inpatient admission.[15] This is followed by upper tract urinary calculi in 10.38%. The significant burden of stone disease found in this review involving the kidneys and ureters may be related to the hot weather condition of Sokoto which is a prominent cause of dehydration and recognized risk factor in the etiopathogenesis of urinary stone formation.[29] Despite this, studies done earlier recognized that the etiology of some lower urinary tract stone is traceable to childhood and tend to exhibit characteristics similar to the stones of endemic regions.[30,31]

Urethral stricture accounted for 8.91% and prostate adenocarcinoma seen in 7.41% were the 4th and 5th leading cases of urologic ailments in this study. The posttraumatic cause of stricture is closing the gap that existed between it with postinfective cause which has been the leading etiology in our environment.[32,33] Urologic conditions of lower frequency in our environment were infertility 4.28%, ureteral obstruction postschistosomal infestation 3.62%, hypospadias 3.01%, acute scrotum 2.80%, varicocele 1.81%, and erectile dysfunction 1.65%. Other numerous infrequent urologic ailments which
cut across various urological organs cumulatively were 25.65% and are as observed previously.

The limitations of this study include its retrospective design and its single-center nature. As such, we recommend a prospective and multicenter in future studies.

**Conclusion**

BPE, bladder tumor, upper tract urinary calculi, urethral stricture, and prostate adenocarcinoma are the common urologic diseases in our environment. This study has established a very important database on the spectrum of urologic cases or diseases in our practice location. It is hoped to form a reference point for further and future research. The information generated will guide service expansion and specialized workforce development as well as direct government policy and nongovernmental support on urologic diseases in this community.

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**Conflicts of interest**

There are no conflicts of interest.

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