

Urogenital Trauma: Epidemiological and Diagnostic Aspects at the Borgou University and Departmental Hospital Center (Benin)

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How to cite this paper: Sambo, B.T., Hodonou, M.A., Hadonou, A.A., Gandaho, K.I., Seto, D.M. and Allode, S.A. (2022) Urogenital Trauma: Epidemiological and Diagnostic Aspects at the Borgou University and Departmental Hospital Center (Benin). *Open Journal of Urology*, 12, 509-518.
<https://doi.org/10.4236/oju.2022.1210050>

Received: September 8, 2022

Accepted: October 24, 2022

Published: October 27, 2022

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Abstract

Objective: To study the epidemiological and diagnostic aspects of urogenital trauma at the Borgou University and Departmental Hospital Center. **Material and Methods:** This was a descriptive cross-sectional study that took place over a period of 4 years and 4 months (52 months) from January 1st 2017 to April 30th 2021. All cases of urogenital trauma treated in the General surgery department during the period were collected. Patient records, hospitalization registers and operating reports were used to collect information. Data entry was done using Epi data 3.1 software, French version. The analysis was performed using MedCalc software (version 19.4.1. Mariakerke, Belgium), and Epi info software version 7. **Results:** In 52 months, 75 cases of urogenital trauma were collected. The prevalence of urogenital trauma was 1.1% of admissions with an annual incidence of 17.3 cases. The modal age class was [20; 40], *i.e.* 49.3%. Males accounted for 76.0% (n = 57) of cases. Urethral and kidney injuries were found in 33.3% and 21.3%, respectively. The external genitalia was involved in 24.0%. Road traffic accidents occupied the first place with 62.6%. Kidney lesions were revealed by lumbar pain in 62.5% (n = 10) and post traumatic hematuria in 25% (n = 4) of cases. Most of the patients (n = 8, *i.e.* 50%) were classified as grade I according to the AAST classification. **Conclusion:** Urogenital trauma is common in our environment and can be life-threatening. Knowledge of their epidemiology will allow for prevention and good management.

Keywords

Urogenital Trauma, Epidemiology, Diagnosis, Benin

1. Introduction

Urogenital tract lesions are open or closed lesions resulting from injury to the urinary and/or genital tract [1]. In the countries judged, they represent 8% to 10% of all injuries [1] [2]. Its prevalence is underestimated in Africa and is less than 1% [3]. Epidemiological data on urogenital trauma are rare in sub-Saharan Africa [2] [3] [4]. These lesions may involve the kidney, ureters, bladder and urethra, sometimes the external genitalia. Urethral lesions are the most followed by kidney and bladder lesions [3]. In the event of traumatic rupture of the urethra, the clinical picture is that of complete post-traumatic bladder retention [4]. Kidney trauma most often occurs in a context of polytrauma. A renal lesion must be suspected in the event of a fracture of the last ribs, whether or not associated with hematuria [3] [4]. The constant increase in the demography of the city of Parakou since the creation in 2001 of the University of Parakou justifies the high frequency of road traffic accidents and particularly urogenital trauma. This study was initiated with the aim of evaluating the place of urogenital trauma in the general surgery department of the Borgou University and Departmental Hospital Center (CHUD-B).

2. Patients and Methods

This is a descriptive cross-sectional study that took place over a period of 4 years 4 months (52 months) from January 1, 2017 to April 30, 2021, in the general surgery department of CHUD-B. The study population consisted of all patients admitted for clinical, radiological or intraoperative discovery of urogenital trauma. Was considered to have a urinary tract lesion any patient victim of a trauma with or without a urinary warning sign (haematuria, lumbar pain) in whom imaging (ultrasound, CT) confirms renal damage. Genital lesions were evoked in the presence of pain in the genital organs with an increase in volume in a traumatic context, confirmed or not by imaging or intraoperative observations. A pre-designed survey form was used to enhance the information. The variables were clinical (nature of trauma, clinical and paraclinical signs) and sociodemographic (Age, sex, ethnicity, profession and origin). Data entry was carried out in an input mask designed and structured using Epi data 3.1 software, French version. The analysis was performed using MedCalc software (version 19.4.1. Mariakerke, Belgium), and Epi info software version 7. For descriptive statistics, we calculated numbers and their proportions (relative frequencies) for qualitative variables, and means and their standard deviations for quantitative variables. An opinion from the local medical research ethics committee of the University of Parakou (CLERBUP) was taken before the start of the collection of information.

3. Results

3.1. Epidemiological Aspect

3.1.1. Prevalence

In 52 months, 75 cases of urogenital trauma were collected. During the same period, 5546 patients were seen in the surgery department. The prevalence of uro-

genital trauma at CHUD-B was estimated at 1.13% (95% CI 1.01 to 1.61).

3.1.2. Age

The average age of the patients was 31.2 ± 16 years, with extremes of 1 year and 70 years. The modal age class was [20; 40], *i.e.* 49.3% of the sample (**Figure 1**).

3.1.3. Sex

Male subjects represented 76 % (n = 57) of our sample against 24 % (n = 18) for females, *i.e.* a sex ratio of 3.2. The other sociodemographic characteristics of the patients are represented in **Table 1**.

3.2. Diagnostic Aspect

3.2.1. Topography of Lesions

Some patients had one or more lesions of the urogenital system at different levels. The **Figure 2** represents the distribution of patients according to the different

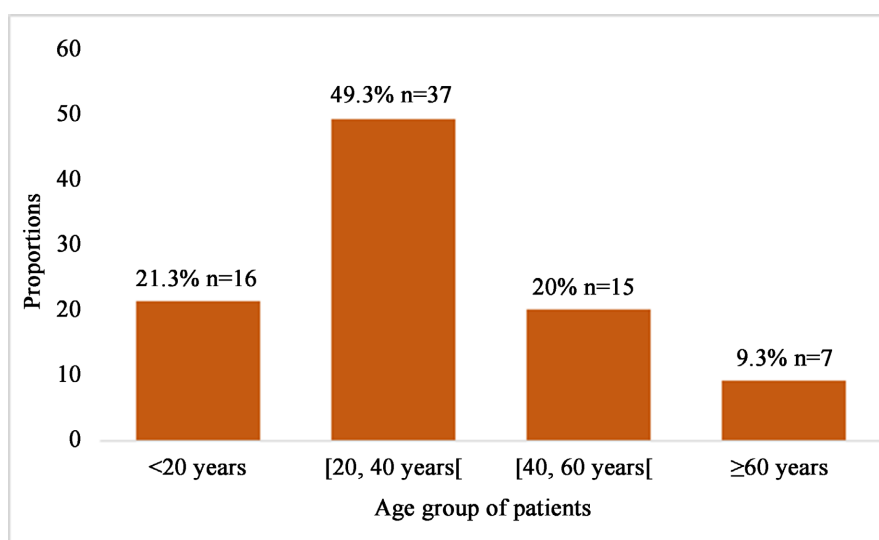


Figure 1. Distribution of patients with urogenital trauma according to age groups.

Table 1. Distribution of patients with urogenital trauma according to their sociodemographic characteristics

		No of cases	Percentage
Marital status	Married	44	58.7
	Single	30	40.0
	Divorced	1	1.3
Profession	Worker*	45	60.0
	Pupil or student	17	22.7
	Without job	9	12.0
	official	4	5.3
Address	Parakou	40	53.3
	Outside Parakou	35	46.7

*Worker = Driver, Carpenter, farmer, craftsmen, housewife.

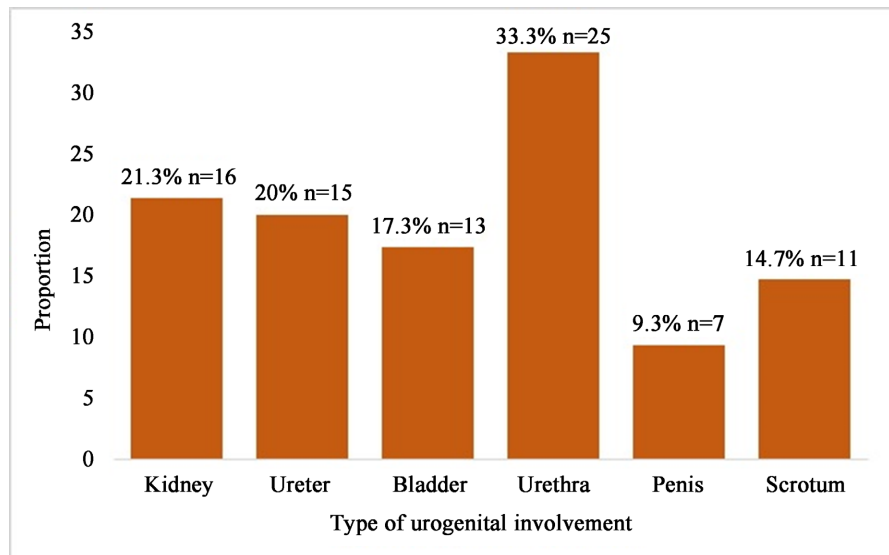


Figure 2. Distribution of patients according to the type of urogenital involvement.

damage of the urogenital system.

3.2.2. Kidney Trauma

Prevalence: the hospital prevalence of kidney trauma at CHUD-B was 0.3% in our study. In the 75 cases of urogenital trauma, the prevalence of kidney trauma was 21.3%.

Mechanism of occurrence: road traffic accidents ranked first with 62.6% followed by domestic accidents (18.7%) and falls from a height (18.7%).

Clinical signs: renal lesions were revealed by post traumatic hematuria ($n = 4$, 25.0%), lumbar pain ($n = 10$; 62.5%). The hemodynamic status was stable in nine (56.3%) patients. Seven (43.7%) others had hemorrhagic shock with low blood pressure and a small, thready pulse.

Classification: most of the patients were classified at grade I according to the AAST classification, *i.e.* 50.0% ($n = 8$) followed by grade II and IV in the same proportion 18.7% ($n = 3$) each and grade III 12.6%. The affected side was proportional, *i.e.* 50% on the right as on the left.

3.2.3. Bladder Trauma

Prevalence: the hospital prevalence of bladder trauma at CHUD-B was 0.23%. In the 75 cases of urogenital trauma, the prevalence of bladder trauma was 17.3%.

Mechanisms of occurrence: The road traffic accident represented the most occurrence with a proportion of 61.5% ($n = 8$) followed by falls from a height of 23.1% ($n = 3$). The work accident and the iatrogenic cause (digestive surgery) were found in 7.7% ($n = 1$) each one.

Clinical signs Bladder lesions were revealed by certain signs: they were macroscopic post-traumatic hematuria ($n = 3$, 23.1%), hypogastric pain ($n = 10$, 76.9%) and acute retention of urine ($n = 4$, 30.8%). The hemodynamic status was unstable in one patient. **Table 2** summarizes the various clinical findings.

Table 2. Distribution of clinical signs observed in patients with bladder trauma.

	No of cases	Percentage
Complaints		
Hypogastric pain	10	76.9
Acute retention of urine	04	30.8
Macroscopic hematuria	03	23.1
General condition		
Normal blood pressure	01	7.7
Low blood pressure	01	7.7
Tachycardia	01	7.7
Physical signs		
Vesico-cutaneous fistula	01	7.7
Hypogastric pain	10	76.9
General Defense	02	15.4
Dullness of the flanks	01	7.7

3.2.4. Urethral Trauma

Prevalence: the hospital prevalence of urethral trauma at CHUD-B was 0.44%. In the 75 cases of urogenital trauma, the prevalence of urethral trauma was 33.3%.

Clinical signs: urethral lesions were revealed by the following signs: post traumatic urethrorrhagia in all patients (n = 25), acute urinary retention (n = 17; 68.0%), perineal pain (n = 18; 72.0%), macroscopic hematuria (n = 1; 4.0%)

3.2.5. Trauma to the External Genital Organs

The prevalence was 0.31%. In the 75 cases of urogenital trauma, it was 24.0%.

3.2.6. Associated Lesions

The associated lesions were mainly splenic fracture and mesenteric contusion in 4 cases each one, *i.e.* 30.8%, and cranio-cerebral trauma in 3 cases (23.1%). There was 1 case of rib fracture and 1 case of abdominal contusion associated with thoracic contusion.

4. Discussion

4.1. Prevalence

In the present study, urogenital trauma accounted for 1.1% of admissions to the general surgery department. This rate is lower than those reported to the CNHU HKM by Ouattara *et al.* [5] and Yevi *et al.* [6], which were 7% in 2013 and 3% in 2019 respectively. The two previous studies were carried out in urology departments only treating urological lesions. This rate is low because it was calculated in the number of all patients who consulted urgently in a general surgery de-

partment taking charge of surgical conditions regardless of the specialty. Lower prevalences have been reported in the sub-region: Kambou *et al.* [7] in Burkina Faso (0.2%) and Dekou *et al.* [3] in Togo (0.2%). Today, we are witnessing an increase in cases of urogenital trauma. This is explained by the fact that we are witnessing a modernization of transport infrastructure and means of travel and also by the presence for several years of urologists in the surgery department involving a systematic search for urogenital lesions in all patients received for trauma.

4.2. Age

Young adults pay a heavy price for traffic accidents because of their professional occupations involving constant mobility. Our study corroborates this observation given the average age of the patients, which was 31.2 years. Whatever the lesion topography on the urogenital tract, road traffic accidents were the main mechanism for the occurrence of these lesions. Lower average ages were reported by Kambou *et al.* [2] and Salimi *et al.* [8] which were 27.1 years and 25 years respectively. This can be explained by the fact that young people constitute the largest and most active part of the population of developing countries; they are generally the most exposed to trauma. Other authors have mentioned that the high-risk activities carried out by men could explain the young age of the injured [9].

4.3. Sex

Most studies have reported a male predominance [10]. This is the same observation made in our series. Indeed, a male predominance was noted with a sex ratio of 3.2. Two reasons seem to justify this: at the professional level, men are more exposed than women. In addition, the anatomical configuration of the external genital organs makes men more vulnerable to those injuries [2]. The high number of urethral trauma ($n = 25$) and external genital organs ($n = 18$) in our study confirms this assertion.

4.4. Kidney Trauma

The prevalence of kidney trauma was 21.3% of urogenital trauma in our series and ranks second among urogenital trauma. According to Kambou *et al.* [2] in Burkina Faso in 2017, kidney trauma ranked first among urogenital trauma with a proportion of 26.1%. This low rate in our series can be explained by the inaccessibility to advanced diagnostic means and therefore benign lesions that go unnoticed. Hematuria or post-traumatic lumbar pains were the indications for imaging exploration in our context. However, any serious trauma patient should benefit from a general exploration including a thoraco-abdomino-pelvic computed tomography [11]. The mechanisms of onset of blunt kidney trauma are dominated by road traffic accidents [11]. In the present series, these accidents occupied the 1st place of the mechanisms of occurrence with 62.6% of the renal

traumas. These results are comparable to those of Kane [12] in Dakar who found in his series that road traffic accidents were the leading cause of kidney trauma in 54%. This can be explained by the violence of these traumas which takes into account the two mechanisms namely: the violent direct impact and the renal shock by sudden deceleration. Clinically, lumbar pain (62.5%), macroscopic hematuria (25.0%) and hemodynamic instability (43.7%) were the main clinical signs found in our study. These results corroborate the literature data. Indeed, in Morocco, the same observation was made by Mohamed *et al.* [13] who reported the same clinical manifestations, namely: lumbar pain, macroscopic hematuria and hemodynamic instability but in different proportions, *i.e.* respectively 100 %; 72% and 32%. In addition, according to Nash *et al.* [14], Rosen *et al.* [15], clinically in major renal trauma, low back pain is most often associated with macroscopic hematuria or signs of shock. This post-traumatic lumbar pain, absent in some patients in our study, can be explained by the fact that it can be masked by other painful lesions located elsewhere in contexts of polytrauma and in the circumstances of coma. The diagnostic means in our study were limited and based only on ultrasound and uroscanner in some cases. Thus, this lesion assessment based on ultrasound and uroscanner showed that most of the patients were classified as minor grades I and II (11 cases) according to the AAST classification, *i.e.* 68.7% followed by grade IV (03 cases) and grade III (02 cases). Minor kidney injuries are the most frequently encountered in African literature. This predominance does not exclude the absence of serious injuries: on the contrary, our health systems without a medical transport system do not allow the survival of serious injuries during transport from the scene of the accident to the treatment centre. These serious traumas are therefore diagnosed post mortem in our working conditions [13] [15].

4.5. Bladder Trauma

Bladder trauma accounted for 17.3% of urogenital trauma recorded in this study. These data are similar to those reported by Kambou *et al.* in Burkina Faso in 2017 [2] and by Fouelifack *et al.* in Cameroon in 2021 [7] [16] who found 13% and 13.7% of urogenital trauma respectively. In Benin, Yevi *et al.* [7] in 2018 reported that bladder trauma accounted for 13.1% of urogenital trauma. The road traffic accident was the most represented mechanism of occurrence with a proportion of 61.5% followed by falls from a height (23.1%). Motor vehicle collisions were the most common mechanism with a proportion of 45% [17].

4.6. Urethral Trauma

The prevalence of urethral trauma was 33.3% of urogenital trauma. They occupy the first place of urogenital trauma in our series. The same observation was made by Bobo *et al.* [18] in Guinea Conakry, and Owon'Abessolo *et al.* [19] in Cameroon who found that urethral trauma was the most frequent urogenital trauma also with respectively 62, 2% and 45.6%. This first place in our context

may be due to the fact that the lesions are obvious and patients are sometimes referred. The most frequent mechanism of occurrence was road traffic accidents with a proportion of 60%. The same observation was made by Bobo *et al.* [18], Owon'Abessolo *et al.* [19] and Guirrassy *et al.* [20].

4.7. Trauma of External Genital Organs

The incidence of trauma to the external genital organs is probably underestimated. The number of patients with minor lesions who are medically treated by emergency departments and general practitioners, or who do not consult, and who are therefore not included in the series of patients treated in urology departments remains unknown [18]. Trauma of external genital organs accounted for 24.0% of urogenital trauma in our series. In Senegal, Bah *et al.* [21] reported six cases in four years while Fouelifak *et al.* [16] reported a 25.4% frequency of urogenital trauma.

4.8. Associated Lesions

Abdominal and craniocerebral traumas were the lesions most often associated with urogenital trauma. These same findings were made by Perrin *et al.* who found that urogenital trauma was often associated with abdominal and pelvic trauma [22]. Similarly, Salami *et al.* in Iran [8] and Bariol *et al.* in Scotland [23] found associated lesions in 73.7% and 51% of cases respectively, demonstrating the frequency of associated lesions during urogenital trauma.

The limitations encountered were of a diagnostic nature. In view of the data in the literature, several diagnostic explorations such as cystoscopy and urography, which provide better diagnostic precision, remain unavailable in our working conditions. Similarly, in a retrospective study, some urological lesions may go unnoticed. Beyond these biases encountered, we believe that the study has good validity and could provide courses of action to improve the management of urogenital trauma

5. Conclusion

The prevalence of urogenital trauma was 1.13% of surgical admissions at CHUD /B-A. Young adults with an average age of 31.2 years were the most victimized. These traumas are the prerogative of male subjects with a predominance of 76% of patients. The urethra and external genital organs are the most affected. Road traffic accidents remain the main source of these injuries, hence the need to put in place measures to prevent these accidents.

Conflicts of Interest

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

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