

Pediatric Urological Emergencies: Clinical-Etiological Profile and Management at the Conakry University Hospital

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Abstract

Introduction: The objective of our study was to describe the clinical characteristics, highlight the etiologies and therapeutic modalities of pediatric urological emergencies. **Material and Methods:** Descriptive study with retrospective collection from 2019 to 2023 including all pediatric patients (≥ 17 years) who consulted urgently for a urological pathology. **Results:** We recorded 54 pediatric urological emergencies in five years, *i.e.* an average annual frequency of 10.8 cases. We found an increase in the annual frequency from 7 cases in 2019 to 17 cases in 2023. Adolescents and children were the most affected age groups, *i.e.* 50% and 46.29% respectively. The average age was 8.83 years. Urological emergencies mainly affected boys (89%) with a sex ratio of 8 boys to one girl. Bladder urinary retention, acute large scrotum, prolonged painful erections were the main reasons for emergency consultation, respectively 33.33%, 14.81% and 9.5%. On the etiological level, non-traumatic urological emergencies were dominated by posterior urethral valves (14.81%); spermatic cord torsion (11.11%), and ischemic priapism (9.25%). Traumatic emergencies were dominated by post-traumatic urethral strictures (11.11%) and recent urethral trauma (9.25%). Urethral catheterization (22.22%), suprapubic catheterization (20.37%), distal cavernospongious shunts (9.25%) were the most commonly performed emergency procedures. **Conclusion:** Pediatric urologi-

cal emergencies are relatively rare in our practice, but their frequency is constantly increasing. They mainly affect boys and adolescents. Urinary retention in the bladder, acute large scrotal sac, ischemic priapism and urethral trauma are the main emergencies. Bladder drainage, spermatic cord detorsions, distal cavernous shunts are the main therapeutic modalities in emergencies.

Keywords

Pediatric, Emergency, Urological, Retention

1. Introduction

Pediatric urological emergencies are much less frequent than those in adults and the elderly [1].

They present in clinical forms that can be life-threatening or functionally life-threatening and make rapid and effective intervention by a healthcare professional qualified in urology essential [2].

These pediatric urological emergencies are the consequence of multiple and varied anomalies which may be congenital, traumatic, iatrogenic or simply linked to the terrain. They may draw attention to a previously unnoticed urological condition or to the progression of a known urological diagnosis [1].

These urological problems require clinical evaluation, investigations and appropriate treatment to alleviate parental concerns, prevent morbidity/mortality and improve the patient's quality of life.

They require an etiological search which often determines emergency treatment.

Pediatric urological emergencies involve specific management features: medical or surgical, immediate or delayed emergency, with or without imaging, as well as their share of technical procedures (bladder catheterization, cystocatheter, reduction of paraphimosis) taking into account pediatric specificities [3].

The aim of our study was to describe the clinical particularities, highlight the etiologies and analyze the therapeutic modalities of pediatric urological emergencies.

2. Materials and Methods

This was a descriptive study with retrospective data collection over 5 years from 2019 to 2023. at the urology department of the Conakry University Hospital.

The data collection sheet, hospital records, on-call records, and surgical report records were used as study material.

The study focused on all patients who had emergency consultations for a urological pathology.

We included in the study all pediatric patients (≥ 17 years) who consulted in emergency for a urological pathology and who were registered in the on-call reg-

ister, with a correct and complete description of the diagnostic and therapeutic management.

We conducted an exhaustive recruitment, with patients who met our inclusion criteria representing our sample size.

The study variables were frequency, age, sex, reasons for consultation, consultation time, etiologies of emergencies, and emergency procedures performed.

We determined the annual frequencies of urological emergencies over the five years of study.

Pediatric age groups were defined according to the World Health Organization (WHO) model [4].

- Newborn: 0 to 28 days
- Infant: 29 to 23 months
- Child: 2 to 11 years old
- Adolescent: 12 to 17 years old

We used Microsoft Word, Excel for data entry and presentation and statistical tools (SPSS version 23.0, CS Pro 7.6.0 and MS Excel 2016 software) for data analysis.

Quantitative variables were described by mean, standard deviation, median and interquartile range. Qualitative variables were presented as frequency and percentage.

We minimized accuracy bias by encoding the collection sheets.

Ethical Approvals and Consent to Participate:

Full approval was granted by the Ethics Committee of the Urology Department of the Ignace Deen University Hospital in Conakry. Free and informed consent was obtained from all participants. Confidentiality of the collected data was guaranteed.

3. Results

We collected 54 urological emergencies in 5 years, between 2019 and 2023, in pediatric patients at the urology department of the Conakry University Hospital.

The average annual frequency of urological emergencies was 10.8 cases.

We found an increase in the annual frequency of pediatric urological emergencies from 7 cases in 2019 to 17 cases in 2023 (**Figure 1**).

Adolescents (12 to 17 years) and children (2 to 11 years) were the most affected age groups, 50% and 46.29% respectively. The average age was 8.83 years with extremes of 17 days and 17 years (**Figure 2**).

Urological emergencies mainly affected boys (89%) with a sex ratio of 8 boys to 1 girl (**Figure 3**).

Bladder urinary retention, acute large scrotum, prolonged painful erections, renal colic and urethrorrhagia were the main reasons for emergency consultation, *i.e.* 33.33%, 14.81% and 9.5% respectively for each of the last three (**Table 1**).

The mean time to consultation after the onset of symptoms was 70.1 hours with extremes of half an hour and 120 hours, and 79% of emergencies were received

before or 72 hours after the onset of the symptoms that motivated the emergency consultation (**Figure 4**).

Non-traumatic pediatric urological emergencies were in the majority (64.81% versus 35.19% for traumatic ones) (**Table 2**).

Etiologically, non-traumatic urological emergencies were dominated by posterior urethral valves (14.81%); spermatic cord torsion (11.11%), ischemic priapism (9.25%) and upper urinary tract stones (9.25%) (**Table 2**).

Traumatic pediatric urological emergencies were dominated by post-traumatic urethral strictures (11.11%), recent urethral trauma (9.25%) and scrotal trauma (7.4%) (**Table 2**).

Hematocolpos due to imperforate hymen was the major cause of bladder urinary retention in young girls.

Urethral catheterization (22.22%), suprapubic catheterization (20.37%), distal cavernospongious shunts (9.25%), exploratory scrotomy with spermatic cord detorsion and orchidopexy (9.25%) were the most commonly performed emergency procedures (**Table 3**).

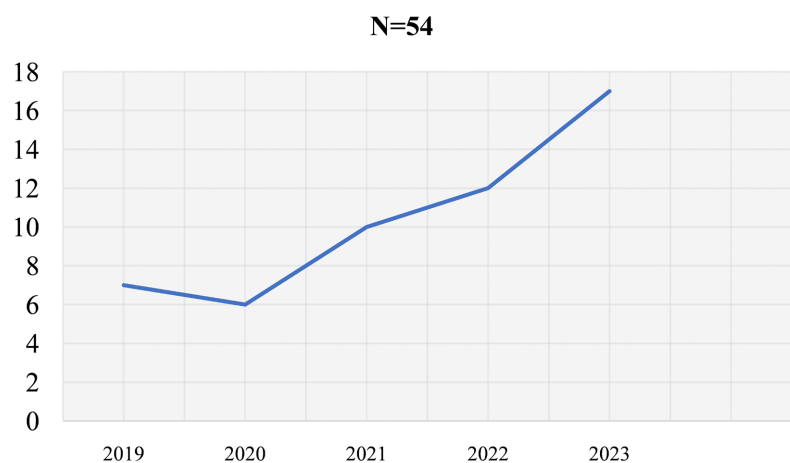


Figure 1. Annual frequency of pediatric urological emergencies.

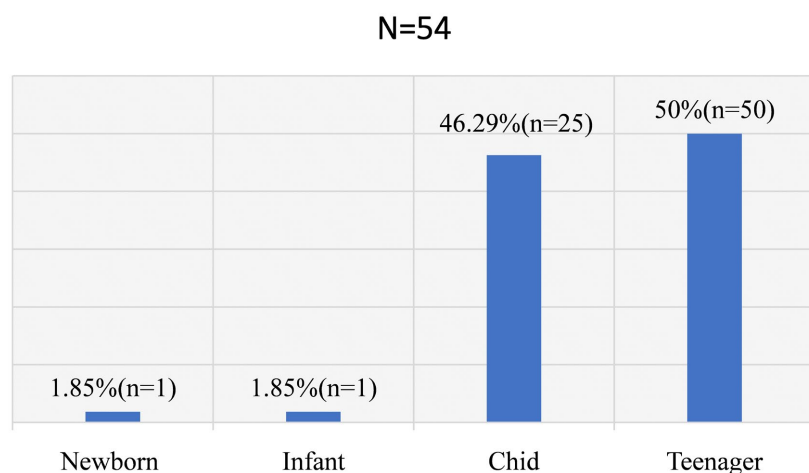


Figure 2. Frequency of urological emergencies by pediatric age categories.

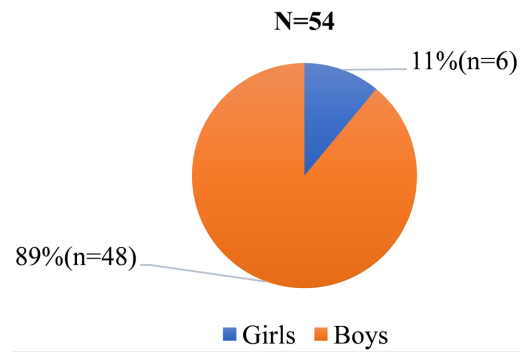


Figure 3. Frequency of pediatric urological emergencies by sex.

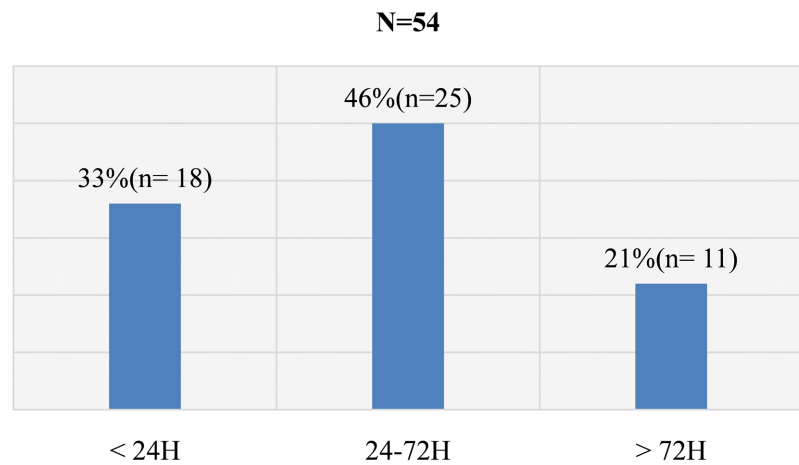


Figure 4. Consultation time for pediatric urological emergencies.

Table 1. Reasons for consultation in pediatric urological emergencies.

Reasons for consultation	Effective	Percentage
Bladder urine retention	18	33.33
Bladder urinary retention and vulvar swelling	2	3.7
Hematuria	1	1.85
Dysuria and painful preputial urination	2	3.7
Hematuria and traumatic lower back pain	3	5.55
Lower back pain and fever	1	1.85
Prolonged painful erections	5	9.25
Big sharp purses	8	14.81
Renal colic	5	9.25
Swelling and pain of the glans	1	1.85
Traumatic wound of the penis	1	1.85
Traumatic bursal injury	2	3.7
Urethral bleeding	5	9.25
TOTAL	54	100

Table 2. Etiologies of pediatric urological emergencies.

	Effective	Percentage
Non-traumatic etiologies	35	64.81
○ Posterior urethral valve	8	14.81
○ Ischemic priapism	5	9.25
○ Torsion of the spermatic cord	6	11.11
○ Hematocolpos due to imperforation of the hymen	2	3.7
○ Bladder lithiasis	4	7.4
○ Upper urinary tract stones	5	9.25
○ Bladder tumor	1	1.85
○ Tight phimosis	2	3.7
○ Paraphimosis	1	1.85
○ Pyonephrosis	1	1.85
Traumatic etiologies	19	35.19
○ Post-traumatic urethral stricture	6	11.11
○ Kidney trauma	3	5.55
○ Trauma of the scrotum	4	7.4
○ Traumatic amputation of the penis	1	1.85
○ Recent urethral trauma	5	9.25

Table 3. Emergency actions.

Modality	Effective	Percentage
Indwelling urethral catheterization	12	22.22
Suprapubic catheterization	11	20.37
Cavernous-spongy shunts	5	9.25
Right spermatic cord detorsion and bilateral orchidopexy	5	9.25
Left orchidectomy	3	5.55
Left nephrostomy	1	1.85
Hymen perforation and urethral catheterization	2	3.7
Posthectomy	3	5.55
Double J probe mount	1	1.85
Double-current urethral catheter placement with clot removal and bladder irrigation	1	1.85
Left nephrectomy for hemostasis	1	1.85
Scrotal wound debridement	2	3.7
Pain relief treatment	4	7.4
Therapeutic expectation	3	5.55
Penile hemostatic suture and meatoplasty	1	1.85

4. Discussion

The management of pediatric urological emergencies constitutes a significant part of our department's activities.

We collected 54 pediatric urological emergencies in 5 years with an average annual frequency of 10.8 cases, and an increase in this frequency which went from 7 cases in 2019 to 17 cases in 2023.

The frequency of pediatric urological emergencies is relatively low in our context, this is due to the rarity of urological conditions in pediatric age on the one hand but also to the fact that this was a single-center study carried out only in our department while the emergency and pediatric surgery departments also manage these cases in one way or another.

Olivier *et al.* found that pediatric urological emergencies accounted for 6.3% of emergency admissions to a maternal and child hospital [5].

N'doye *et al.* reported that 2.57% of pediatric surgical emergencies received were urological.

In our series, adolescents (12 to 17 years) and children (2 to 11 years) were the most affected age groups, 50% and 46.29% respectively, with a mean age of 8.73 years [6].

In N'doye's study infants and children represented the most affected age groups, with a mean age of 4.5 years [6].

The mean and age groups are significantly influenced by the predominant type of urological emergency, for example circumcision-related injuries are more likely to occur in newborns and infants whereas external genitalia trauma is more common in children and adolescents.

In the literature, the male predominance of urological emergencies is established [2] [7].

The reason for this male predominance is not known, however differences in the anatomy of the male and female urogenital system may explain it.

AB Diallo *et al.* [7] found the ratio by gender (M/F) to be 16.60.

In our study as in that of Atim *et al.* [8] bladder urinary retention was the first reason for admission to pediatric urological emergency. However, in the study of Chukwubuike Kevin *et al.* It was the second reason for admission after acute large bursae.

Talreja *et al.* [9] reported renal colic as the most common urological emergency.

In our series, the etiologies of bladder urinary retention were dominated by posterior urethral valves and post-traumatic urethral stenosis.

The etiologies of bladder retention in children differ considerably from those in adults and the elderly. Therefore, a complete diagnosis is crucial before specific treatment. Every effort should be made to minimize invasive procedures in children as much as possible [10].

The average consultation time after the onset of symptoms was 70.1 hours with extremes of half an hour and 120 hours, and 79% of emergencies were received before or 72 hours after the onset of the symptoms that prompted the emergency

consultation.

Olivier *et al.* [5] reported a mean consultation time of 4 days with extremes of 1 hour and 10 days. Chukwubuike Kevin *et al.* [1] found in their study that none of the patients presented within 24 h of the onset of their symptoms.

Parental concern about the suffering caused by pediatric urological emergencies is a decisive factor in rapid emergency consultations in our context.

On the other hand, low awareness and poverty, common in low- and middle-income countries, may explain late consultations.

Non-traumatic pediatric urological emergencies were in the majority (64.81% versus 35.19% for traumatic ones).

Priapism, which is a painful and abnormally prolonged erection occurring without any sexual stimulation, is a situation that often occurs in adolescents with sickle cell disease. It poses the problem of recurrence and jeopardizes erectile prognosis [11].

It ranks third among non-traumatic pediatric urological emergencies in our study.

Olivier *et al.* found that priapism accounted for 5.2% of pediatric urological emergencies and that all patients had SS sickle cell disease [5].

Traumatic pediatric urological emergencies were dominated by post-traumatic urethral strictures (11.11%), recent urethral trauma (9.25%) and scrotal trauma (7.4%).

Chukwubuike Kevin *et al.* [1] found that traumatic urological emergencies were dominated by traumatic catheterizations (24.1%) followed by circumcision accidents (13.1%).

These differences can be explained by the age group of the patients recruited.

Hematocolpos due to imperforate hymen was the major cause of bladder urinary retention in young girls in our series.

Rimtebaye *et al.* [12] found 6 cases of hematocolpos in adolescent girls revealed by complete retention of bladder urine.

Hematocolpos is the progressive accumulation of menstrual blood in the vaginal cavity at puberty as a result of imperforation of the hymen, which can cause, by mass effect, an obstacle to the evacuation of urine which clinically results in cyclical pelvic pain, primary amenorrhea and bladder retention [13].

Urethral catheterization (22.22%), suprapubic catheterization (20.37%), distal cavernous shunts (9.25%), exploratory scrotomy with detorsion of the spermatic cord and orchidopexy (9.25%) were the most commonly performed emergency procedures.

In the study by Chukwubuike Kevin *et al.* [1] urethral catheterization was the most commonly performed emergency procedure.

Exploratory scrotomy is the rule in large acute scrotums in children [14].

In the study by Olivier *et al.* [5] urethral catheterization (32%), suprapubic catheterization (16.5%) and exploratory scrotomy were the most commonly performed procedures.

These actions are in line with the types of emergencies most encountered in our study.

5. Conclusions

Pediatric urological emergencies are relatively rare in our practice, but their frequency is constantly increasing. They mainly affect male children and adolescents.

The main emergencies are bladder retention, acute large scrotum, ischemic priapism and urethral trauma.

Bladder drainage, spermatic cord detorsions, and distal cavernous shunts constitute the main emergency therapeutic modalities.

Data Availability

The datasets used and/or analyzed in this study are available from the corresponding author upon reasonable request.

Ethical Approvals and Consent to Participate

Full approval was granted by the Ethics Committee of Ignace deen university hospital center of Conakry. Réf: 134/CUA/2024.

Conflicts of Interest

The authors declare no conflicts of interest.

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