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Pediatric Urological Emergencies: Epidemiology, Pattern and Treatment Outcome

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ABSTRACT

Background: Pediatric urological emergencies constitute an essential part of pediatric surgical practice and remain a common event in the children emergency room. The aim of this study was to evaluate our experience in the management of pediatric urologic emergencies.

Materials and Methods: This was a retrospective study of children aged 15 years and below who presented, as emergent/urgent cases, to the Children Emergency Room (CHER) with problems of the urogenital system. This study covered a period of 5 years. The data extracted included the patients' age, gender, presenting complaint, clinical diagnosis, operative procedure performed, duration of hospital stay and outcome of treatment.

Results: Out of 4,986 cases of pediatric surgical emergencies seen during the 5 year study period, pediatric urologic emergencies accounted for 502 (10.1%) cases of the emergencies. More males were affected. Acutely swollen scrotum and acute hydrocele were the predominant presenting complaint and diagnosis respectively. Urethral catheterization was the most performed emergency procedure. Herniotomy for hydrocele was the most performed electively. Out of the 502 cases of urologic emergencies seen, 221 (44.0%) were discharged from the CHER for follow up in the outpatient clinic. There were 10 (2%) mortalities resulting mostly from overwhelming sepsis.

Conclusion: Urologic emergencies in children may be a cause of morbidity and mortality. Adequate knowledge of the pattern, presentation and management outcome is important to improve patients' care.

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Introduction

Pediatric urological emergencies constitute an essential part of pediatric surgical practice and remain a common event in the children emergency room. Emergency presentations form a significant method of presentation of urology patients in various referral hospitals [1]. Parental anxieties about congenital anomalies or benign urogenital lesions may elicit unplanned visits to the emergency room for evaluation. Urological emergencies may draw attention to a previously unnoticed urologic condition or progression of a known urologic diagnosis [2]. These urologic problems require appropriate and proper clinical evaluation, investigations and treatment to allay parental concerns, prevent morbidity/mortality and to improve quality of life of the patient [2]. The etiologies of these urinary emergencies range from urinary to genital pathologies; males or females may be involved. Urological emergencies have varied presentation. Lack of data in developing countries makes assessment of the urological burden of diseases in children difficult. Similar to other surgical problems in children, urological emergencies in children in developing country are not prioritized due to endemic poverty, hunger, low literacy levels

and cultural beliefs [3, 4]. In low income countries, access to optimal urology emergency care is limited which may lead to poor outcomes [2]. Late presentations, paucity of financial and human resources and out-of-pocket payment in the hospital also adversely affect treatment outcome [5]. There is relative paucity of information on the varying patterns of pediatric urologic emergencies in our setting.

The aim of this study was to evaluate our experience in the management of urologic emergencies in children. This review of pediatric urological emergencies is an important discourse to increase awareness and provide relevant data for health planning and allocation of resources in our setting.

Materials and Methods

This was a retrospective study of children aged 15 years and below who presented, as emergent/urgent cases, to the Children Emergency Room (CHER) with problems of the urogenital system at Enugu State University Teaching Hospital (ESUTH) Enugu, Nigeria. This study covered a period of 5 years, from January 2015 to December 2019. Patients who have had surgery for the same urological pathology at a peripheral hospital before referral to ESUTH for reoperation were excluded from this study.

Patients older than 15 years of age and those with gastrointestinal pathologies were also excluded from the study. ESUTH is a tertiary hospital located in Enugu, South East Nigeria. The hospital serves the whole of Enugu State, which according to the 2016 estimates of the National Population Commission and Nigerian National Bureau of Statistics, has a population of about 4 million people and a population density of 616.0/km². The hospital also receives referrals from its neighboring states. Information was extracted from the case notes, operation notes, operation register and admission-discharge records. The information extracted included the age, gender, presenting complaint, clinical diagnosis, operative procedure performed, duration of hospital stay and outcome of treatment. Diagnosis of urological emergency was made based on clinical and radiological (imaging) finding. The follow-up period was 12 months. Ethical approval was obtained from the ethics and research committee of ESUTH and consent from the patients' caregivers was not required due to the retrospective nature of the study and the identities of the patients were not revealed. Statistical Package for Social Science (SPSS) version 21 (manufactured by IBM Corporation Chicago Illinois) was used for data entry and analysis. Data were expressed as percentages, mean, and range.

Results

Patients characteristics

Out of 4,986 cases of all pediatric surgical emergencies seen during the 5 year study period, pediatric urologic emergencies accounted for 502 (10.1%) cases. More males were affected. Demographic features of the patients are shown in Table 1.

Table 1: Patients' characteristics (n=502)

Parameter	Value
Mean age of the patients	6 years (1 month-14 years)
Gender	
Male	428 (85.3%)
Female	74 (14.7%)
Mean interval between onset of symptoms and presentation	2 days (1-3)
Mean interval between presentation and intervention	6 hours (3-36)
Mean duration of hospital stay	6 days (2-10)

Presenting symptoms of the patients

The presenting symptoms of the patients are depicted in Table 2.

Table 2: Presenting symptoms (n=502)

Presenting symptoms	Number of patients (%)
Acutely swollen scrotum/masses	201 (40.0)
Inability to pass urine	132 (26.3)
Penile problems	121 (24.1)
Abdominal masses	27 (5.4)
Hematuria	11 (2.2)
Abnormal appearance of the genitalia	8 (1.6)
Exposed urinary bladder	2 (0.4)

Clinical diagnosis

The specific diagnoses of the patients are reflected in Table 3.

Table 3: Specific diagnosis of the patients (n=502)

Diagnosis	Number of patients (%)
Acute hydrocele	196 (39.0)
Urinary retention due to traumatic catheterization	121 (24.1)
Testicular torsion	66 (13.1%)
Circumcision injuries	66 (13.1%)
Renal tumors	21 (4.2)
Urethral/bladder trauma	7 (1.4)
Ambiguous genitalia	5 (1)
Testicular tumors	5 (1)
Urachal cysts	4 (0.8)
Kidney trauma	4 (0.8)
Prolapsing ureterocele	3 (0.6)
Bladder exstrophy	2 (0.4)
Hydrometrocolpos	2 (0.4)

Operative procedure performed

The urologic emergencies were treated urgently, emergently or electively. For instance, hydroceles were treated electively by herniotomy. And this was the most common performed elective surgical procedure in the current series. Children in urinary retention was treated by urethral catheterization, however, urinary retention following traumatic catheterization was treated by suprapubic cystostomy and urethroplasty performed at a later date. Urethral catheterization was the most performed emergency procedure. Circumcision injuries such as bleeding were treated by pressure application and ligation of bleeding vessels. Testicular torsion required bilateral orchidopexy. Renal tumors such as nephroblastoma were treated by nephroureterectomy. Other pathologies were treated accordingly.

Outcome of treatment

Out of the 502 cases of urologic emergencies seen, 221 (44.0%) were discharged from the CHER for follow up in the outpatient clinic, 254 (50.6%) were admitted into the ward for further care, 40 (8.0%) were co-managed with other specialties. There were 10 (2%) mortalities resulting from overwhelming sepsis and metastasis from malignant renal tumors. Emergency presentations of cancer-bearing children were in the form of hemorrhage from tumor rupture, renal failure and tumor metastasis.

Discussion

Emergency services are some of the most important functions of any hospital and they cut across all specialties [6]. Urological emergencies are not infrequent but may be less common when compared to other surgical specialties [6]. Largely, they may not be immediately life threatening but require prompt and proper response to prevent long term complications [6]. Surgical intervention is required in most urological emergencies in children. Urological emergencies can involve the kidneys, ureters, urinary bladder, urethra, penis, scrotum or testicles [7].

In the present study, pediatric urologic emergencies accounted for about one-tenth of all the pediatric emergencies seen during the study period. This is in contrast to report of Salako et al [2]. The difference in epidemiology may be explained by the cohort of

patients recruited into the different studies. For instance, some of the studies involved both pediatric and adult patients. There is male predominance in the current study. Similar studies also reported this male predominance with regards to urological emergencies [6, 8]. The reason for the male predominance is not known. However, differences in the anatomy of the male and female urogenital system may explain it. The mean age of our patient was 6 years. One study from Nuremberg, Germany that studied urinary retention in children reported a mean age of 5.3 years [9]. In a particular study, the predominant urological emergency may determine the mean age of the patients. For instance, circumcision injuries are more likely to occur in neonates. None of the patients presented within 24 hours of onset of their symptoms. Low level of awareness and poverty that is common in low/middle income countries may explain the delayed presentation. A study from Uganda highlighted the impact of delayed presentation and paucity of trained pediatric surgeons on pediatric surgical outcomes [10]. Most of the patients had their intervention within 6 hours of presentation. The emergency nature of the surgical conditions necessitated immediate intervention. However, in children who presented with hydrocele, they were treated electively. The duration of time the patients stayed in the hospital depended on the nature of the pathology and complexities of the surgery.

Acute scrotal swellings resulting from hydroceles were the most common presenting complaint/diagnosis in the patients. Leslie and Cain also reported acutely swollen scrotum as the most common urologic emergency [11]. However, Hamza et al and Atim et al reported urinary retention as the most common urological emergency [6, 12]. Talreja et al documented renal colic as the most common urologic emergency [13]. These differences may be explained by the age range of the patients recruited. For instance, urinary retention is more likely to be most common in studies involving both children and adults who are older than 40 years of age. In the current series, urinary retention accounted for about one-quarter of all urologic emergencies. These urinary retentions resulted from urethral trauma during catheterization, pains of surgical procedures and penile injuries.

The operative procedure performed depended on the etiology of the urological emergency. Testicular torsion required bilateral orchidopexy for viable testis and orchidectomy for non-viable testis. With regards to testicular torsion, time is of the essence. The time interval between onset of symptoms and intervention determines the state/viability of the testis at surgery. Herniotomy was the most performed elective procedure. One study from United States of America also reported herniotomy as a commonly performed procedure in urological emergencies and urgencies [11]. Herniotomy is mostly performed as elective surgeries. Strictly speaking, hydroceles in children are not emergencies per se. However, the anxiety of the parents and sudden increase in size of the hydrocele as seen in communicating hydrocele may explain the presentation to the children emergency room.

In the current series, circumcision injuries accounted for the fourth most common urologic emergency. Okeke et al reported that the number of infants managed for circumcision related injuries has been on the increase [14]. Circumcision injuries range from bleeding, penile amputation, retained plastibell and other circumcision related injuries. The high rate of circumcision injuries may be explained by the fact that most circumcisions in low/middle income country are performed by nurses, traditional birth attendant and untrained personnel. Immediate treatment of circumcision injury entailed securing of hemostasis and maintaining the patency of the urethra.

Neurologically impaired and critically ill children have difficulties in passing urine and needed urethral catheterization. These groups of children may be unable to pass urine. Acute urinary retention resulted mostly from traumatic catheterization by resident doctors. In traumatic catheterization, no further attempt is made at urethral catheterization. Instead, a suprapubic cystostomy is performed as a temporizing measure. One study from northern Nigeria reported urinary retention as the most common urologic emergency and urethral catheterization as the most performed procedure [1]. Suprapubic cystostomy was the most performed emergency operative procedure [1].

About one-half of the patients in the current study were evaluated and discharged from CHER. These patients included those with hydrocele, circumcision injury and urinary retention that resolved spontaneously. This finding is in agreement with a study from north central Nigeria but at variance with another report from south west Nigeria where about 70% of the patients were discharged from the emergency unit [2, 12]. The age of the patients, the nature of the pathology and their treatment may influence time of discharge from the emergency department. The mortality recorded in the present study is comparable to the report of Salako et al [2].

Conclusion

Emergency presentations form a significant method of presentation of pediatric urology patients in various referral hospitals. Urologic emergencies may be a cause of morbidity and mortality in children. Adequate knowledge of the pattern, presentation and management outcome is important to improve patients' care. Some of the preventable urologic emergencies such as circumcision injuries (by untrained personnel) can be avoided.

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