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Paediatric urologic pathologies at the national teaching hospital in Cotonou: A etiological and therapeutic aspects

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ABSTRACT

Background: Urological pathologies of children are dominated by congenital malformations of the kidneys and urinary tract. Their management is often surgical. The objective of this survey was to study etiological and therapeutic aspects of urological presentations in children. **Patients and Methods:** Data for aetiology, treatment, and results in children hospitalized at the Paediatric Surgery service of National Teaching Hospital (CNHU) in Cotonou were retrospectively analyzed from January 1999 to December 2008. **Results:** A total of 214 patients with complete data were evaluated. Urological pathologies represented 4.8% of the hospitalizations in paediatric surgery, with an incidence of 21 cases per year. The mean age was 4.9 ± 3.2 years (age 1 week to 14 years). The male to female ratio was 14:14. Cryptorchidism, hydrocele, nephroblastoma, the posterior urethral valves, ureteropelvic junction obstructions, post-circumcision haemorrhage and hypospadias were the most frequent pathologies. Congenital urological malformations represented 81.3%, followed neoplastic pathologies (7.9%), traumatic pathologies (6.1%) and others (4.7%). The disorders of male genitalia were more frequent and constituted 68.2% of the cases. The anomalies of the urinary tract were 30.8% and intersex disorders were 0.9%. The average age of the children urological pathologies at the time of consultation was 8.85 ± 4.6 years. The treatment was often surgical with a mortality of 2.8%.

Key words: Aetiology, child, epidemiology, treatment, uropathy

INTRODUCTION

Paediatric uropathies represent all surgical pathologies that affect the urinary tract of the child and the disorders of male genitalia. The paediatric uropathies are especially dominated by congenital urological malformations. Tumoural pathologies have a considerable place with nephroblastoma as most significant. Its frequency is estimated at >90% of renal tumours in the child. This paediatric malignancy is responsible of >10% of all cases of childhood cancer.[1] Urolithiasis is rare.[2] The diagnosis of congenital urologic malformations has greatly benefited from progress in antenatal care. Indeed, it is possible to make currently the antenatal diagnosis of most uropathies malformatives, notably those of kidney, ureters and bladder.[3] Tumoural pathologies are very largely accessible clinically, following confirmation by imaging investigations.

The management of these uropathies is often surgical in the majority of the cases and these measures range from simple circumcision to very elaborate interventions.[4]

The general objective of this survey was to study etiological and therapeutic aspects of urological presentations in children. More specifically, we wanted to determine the frequency of various uropathies and to evaluate their therapeutic outcomes in the Paediatric Surgery Service of National Teaching Hospital (CNHU) in Cotonou.

PATIENTS AND METHODS

It is a retrospective study of cases managed at Paediatric Surgery Service in National Teaching Hospital (CNHU), Cotonou, over a 10-year period between January 1999 and December 2008. The dependent variable was urological pathology. The independent variables were the epidemiological, clinical and therapeutic factors. The epidemiological factors included the age and sex of the patients. For the purposes of this study, we selected a new-born baby as any baby aged from 0 to 28 days, while infants were children aged from 29 days to 30 months. The preschool child is from 30 months to 5 years. The small childhood includes children aged 5–10 years and great

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childhood include those aged 10–15 years. The clinical factors were the antecedents, the reason for admission, the time of consultation, the clinical symptoms, and signs and etiologic diagnosis. The therapeutic factors were the treatment method, any delay in treatment, the surgical procedures, the result of the treatment, and the exit mode. Epi info 3.5.1 Statistical software was used for data collecting and analysis. The data collected in each file were processed in the greatest confidentiality.

RESULTS

From 1999 to 2008, 6595 children were hospitalized in Paediatric Surgery for various pathologies. Among them, we counted 318 files of children carrying a urologic pathology (4.8%); 214 out of 318 files were complete and available for analysis. The incidence was 21 new cases per year, with a range of 11–31. Figure 1 shows the distribution of the patients' age.

The mean age was 4.9 ± 3.2 years, ranged from 1 week to 14 years. There was a male predominance (male/female = 14:14). Two patients had intersex disorders and 155 symptomatic children were seen during consultation; 59 were diagnosed during routine examination at the school or for other affections.

The average duration of symptoms before presentation for consultation was 9 ± 5.2 weeks and ranged from 1 week to 5 years. The time of consultation and the circumstances of discovery are illustrated in Table 1.

Patients presenting with clinical signs consulted on average in the first month (3.14 weeks), whereas those not presenting with any signs were presented in the 3 months (12.29 weeks) ($p = 0.04$).

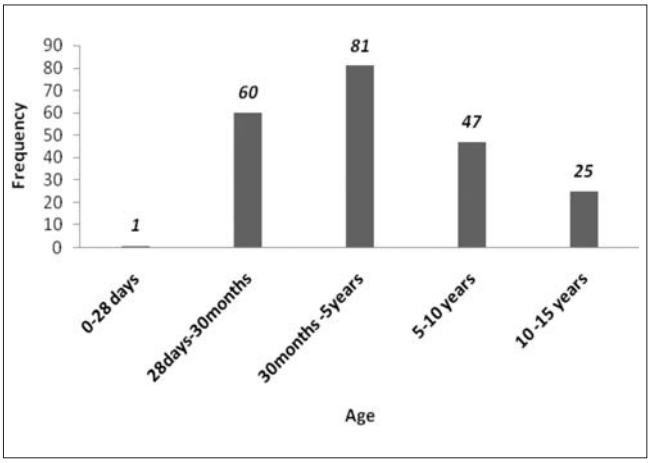


Figure 1: Histogram of the distribution of patient's age

Table 2 shows the frequency of the functional signs in 155 symptomatic children presented. Congenital urological malformations represented 174 cases (81.3%) and neoplastic pathologies 17 cases (7.9%). There were 16 cases of nephroblastoma including 1 bilateral case. Urological injury represented 13 cases (6.1%) and the other miscellaneous pathologies accounted for 10 cases (4.7%).

Table 3 shows the distribution of urologic anomalies diagnosed. We have counted 146 cases (68.2%) of male genital disorders, including 126 cases (58.9%) of testicular pathologies. The urinary tract was involved in 66 cases (30.8%).

The mean delay of management is 6.75 ± 3.8 months from 1 week and 14 years; 50% of the patients were treated in the first week and >75% of the patients were treated in the first month.

The treatment was surgical in 200 patients (93.5%). Medical treatment was used in 14 cases (6.5%). Operative procedures are listed in Table 4.

Six patients died (2.8%), 3 patients (1.4%) escaped out of hospital.

Table 1: Time of consultation and circumstance of discovery

Circumstance of discovery			Delay of consultation	
	Number	%	Means	Extremes
Fortuitous	59	27,6	12 weeks 2 days	1 week at 5 years
Signs	155	72,4	3 weeks 1 day	1 week at 2 years 3 months
Total	214	100	8 weeks 6 days	1 week at 5 years

Kruskal-Wallis Khi2 = 7.73 ddl = 1 $p = 0.04$ (>0.05) (significant difference)

Table 2: Frequency of the functional signs

Functional signs	Number	%
Disorders urines	14	7
Dysury	11	5.5
Urination disorders other than dysury	15	7.5
Acute retention of urine	16	8
Large scrotal	38	19
inguinal tumefaction	03	1.5
Abdominal pain	55	27.5
Bleeding after circumcision	10	5
Vaginal bleeding	5	2.5
Vulvar tumefaction	2	1
Abdominal mass	29	14.5
Hematuria	1	0.5
Scrotal pain	1	0.5
Total	200	100

Table 3: Pathologies according to topography

	Affected	Number	%
Genital apparatus	Cryptorchidism	84	39.2
(*n* = 148, 69.2%)	Hydrocele	37	17.3
	Bleeding after circumcision	10	4.7
	Exstrophy	4	1.9
	Phimosis	3	1.4
	Paraphimosis	2	0.9
	Intersex	2	0.9
	Migrating Testicle	2	0.9
	Torsion of the testicle	1	0.5
	Prostate tumour	1	0.5
	Absence of the testicle	1	0.5
	Cyst of spermatic funiculus	1	0.5
High urinary tract	Nephroblastoma	16	7.5
(*n* = 30, 14%)	Ureteropelvic junction	13	6
	obstructions	1	0.5
	Pelvic kidney		
Low urinary tract	Posterior urethral Valves	15	7
(*n* = 36, 16.8%)	Hypospadias	8	3.7
	Urethral mucosal prolapse	7	3.3
	Meatal stenosis	5	2.3
	Iatrogenic urethral fistula	1	0.5
Total (*N* = 214)		214	100

Table 4: Distribution of various operative procedures performed

	Number	%
Manuel reduction of paraphimosis	2	1
Genitoplasty	2	1
Processus vaginalis excision (hydrocele)	37	18.5
Dilatation of the prepucial opening (Phimosis)	3	1.5
Urethroplasty with repair of chordee	8	4
Pyeloplasty	13	6.5
Hemostasis for circumcision bleeding	10	5
Cystectomy of spermatic funiculus	1	0.5
Meatotomy	5	2.5
Urethral mucous Excision	6	3
Nephrectomy	8	4
Orchidopexy	87	43.5
Fixation of kidney	1	0.5
Urethral catheter	16	8
Uretroplasty for fistula	1	0.5
Total	200	100

Among the 205 patients evaluated, clinical scores were good in 97.1% (199 cases) and bad in 2.9% (6 cases).

DISCUSSION

Lacombe[5] reported that paediatric urology represents 25% of the activity of a Paediatric Surgery Service. This frequency is far above ours for various reasons. Our frequency is a specialist hospital-based and does not necessarily reflect the true figures that a systematic study on a large scale may reveal. Moreover, the rarity of the antenatal diagnosis in our setting limits us to only those patients who survived and present with symptoms. Although urinary tract infection is commonly associated with voiding dysfunction and anatomic abnormalities from congenital malformations of the kidneys and urinary tract, treatment of UTI is in the purview of Medical Paediatric Service and, thus, may not be referred to our service.

With regard to the sex, the male prevalence is not astonishing because urology is devoted to the urinary tract in male and female, but with the reproductive apparatus of the male. The high male prevalence was also observed by Fontaine,[6] who reported 70% in France.

In more than a third of the cases, urological pathology was discovered after the appearance of a clinical sign. This occurred within a mean duration of 8.85 ± 4.6 after the first symptoms and was as long as 5 years. This late access to the care, usual in Africa would be explained by the often precarious socio-economic conditions, the nonexistence of Social Security cover for health-related expenditure. According to Radet *et al.*,[7] there is no urgency in the management of these uropathies. We similarly noted in our study the rarity of urologic symptoms (27.6% of fortuitous discovery), which could partly explain this delay till the first consultation. Indeed, in this survey, the patients presenting with clinical signs consulted on average in the first month (3 weeks and 1 day), whereas those not presenting with any signs were presented in the 3 months (12 weeks and 2 days) ($p = 0.04$).

AKPO *et al.*,[8] reported that urethral pathologies represented 20% of all paediatric uropathies. Our series (16.8%) was in agreement. Neither urinary tract infection nor lithiasis was found in our survey. The urinary tract infections are considered frequent, especially in small girl and are often associated with the posterior urethra valves in young boys.[9] But they are generally treated in Medical Paediatric Service, the patient being referred to a paediatric surgeon only in the presence of recurrence or in the event of suspicion of an organic cause. The aetiology was most frequently congenital malformation (81.3%). Testicular malformations were frequent in our series with 126 cases (58.9%). Cryptorchidism was the most frequent pathology with 84 cases (39.2%). Fontaine *et al.*,[6] recorded 17.2% in their study. Cryptorchidism occurs in approximately 0.8–1.3% of boys.[10] Hydrocele was the second most frequent pathology in the population. Cryptorchidim, hydrocele, cyst of spermatic funiculus, and migrating testicle are consequences of a persistent processus vaginalis in the child.

Nephroblastoma occupies the third place in the distribution with a frequency of 16 cases out of 214 cases (7.5%). Fiogbe *et al.*,[11] found an incidence of 1 case per year. In our series, we counted 17 cases of tumours, majority of which were nephroblastomas (16 cases). Only one more tumour was found in the urogenital system. The comparison of these two proportions using the test of Fisher gives a $p = 0.000$ (<0.05). Therefore, we conclude that renal tumour was more frequent than other tumours of urinary tract. Agossou-voyeme *et al.*,[12] reported childhood malignancies over a 12-year period, wherein they identified 17 urogenital tumours with 8 nephroblastoma. In our study, there was abdomen distension (56.25%) as in the majority of the cases in the literature.[1] The bilateral Wilms' tumour reported in the literature was confirmed in Cotonou (1 case).[1]

Ureteropelvic junction obstructions occupy the fifth rank in the distribution and were evaluated to 6%. According to O' Neill *et al.*,[13] it occurs in 1 in every 200 pregnancies. Exstrophy was the only one pathology recorded in the bladder (1.9%). The incidence of vesical exstrophy varies from 1 in 30,000 births to 1 in 40,000 births and affects boys more than girls. In our study, it exclusively affected boys.[14]

Urethral pathology represents approximately 16.8% of the urologic pathology of the child with high prevalence of posterior urethral valves and hypospadias. The posterior urethral valves and hypospadias respectively occupy the 4th and 6th ranks of childhood uropathies. AKPO *et al.*,[8] in a study on infantile urethral pathologies, highlighted the prevalence of the urethral strictures, followed by hypospadias and posterior urethral valves. The urethral mucosal prolapse, which is rare according to Akpo *et al.*,[8] was confirmed in this study (7 cases).

Bleeding is the most common complication reported after circumcision. It occupied the 6th rank of the uropathies of the child. Indeed, circumcision is generally carried out by the traditional practitioner and nurses.[15,16] Further studies are required to identify associated risks and complications of circumcision and to highlight the potential dangers of badly performed circumcisions. Accordingly, Dieth *et al.*[16] in Abidjan suggested a downward revision of the cost of hospital-based circumcisions and training of the various cadres of practitioners to realize this goal.

The multiplicity of urologic pathologies easily explains the variation of treatment modalities. However, it can be said that the treatment in the majority of the cases is surgical. Medical treatment is only an adjunct to surgical procedures. An example is the case in nephroblastoma with specific chemotherapy as an addition to nephrectomy. All authors agree on this practice.[17] Radiotherapy is not yet available in Benin, and chemotherapy is the only adjuvant therapy for cancer in our country.

Post-therapeutic complications are rare. We noted only 2.9% of failed treatment results. The major problem with treatment however is the loss to follow-up of these children after their exit form therapy.[8] Therefore, their future urologic function could not be evaluated.

CONCLUSION

Urologic affections represent 4.8% of the workload of the Paediatric Surgical Service in Cotonou. The incidence of the uropathies was of 21 new cases per year, with 95.6% male prevalence. The diagnosis of childhood urologic conditions in Cotonou is late because of delayed presentation. Anomalies of male genitalia are dominant and represent 68.2% of the cases. Bleeding of circumcision is the commonest acquired problem. Overall, involvement of the urinary tract in the 2 sexes was 30.8%, and ambiguous genitalia occurred in 1%.

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