Paediatric Urinary Pathologies In Two Hospitals Of Reference In Cotonou (BENIN): Etiologic And Therapeutic Aspects
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Citation

Abstract
Background. Urologic pathologies of children are dominated by congenital malformations of the kidneys and urinary tract. Their management is often surgical.

Objective: The general objective of this survey was to study etiological and therapeutic aspects of urologic pathologies in children.

Patients and methods: Data for aetiology, treatment and results in children hospitalized at the Paediatric Surgery services of two National Teaching Hospitals in Cotonou were retrospectively analyzed from January 2002 to December 2011.

Results. A total of 257 patients with complete data were evaluated. Urologic pathologies represented 4.8% of the hospitalizations in paediatric surgery, with an incidence of 26 cases per year. The mean age was 4.9 ± 3.2 years (age between one week and 14 years). The sex-ratio was equal to 14.14. Cryptorchidism, hydrocele, nephroblastoma, the posterior urethral valves, ureteropelvic junction obstructions, post-circumcision haemorrhage and hypospadias were the most frequent pathologies. Congenital urologic 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 69.3 % of the cases. The anomalies of the urinary tract were 30.7 % and intersex disorders 1.2%. The mean consultation’s duration of children with urologic pathologies was 8.85± 4.6 weeks. The treatment was often surgical with a mortality of 2.8 %.

INTRODUCTION
Paediatrics’ uropathies represent all surgical pathologies which affect the urinary tract of the child and the disorders of male genitalia. The paediatrics’ uropathies are especially dominated by congenital urologic malformations. Tumoral pathologies have a considerable place with nephroblastoma as most significant. Its frequency is estimated at more than 90 % of renal tumors in the child. This paediatric malignancy is responsible of more than 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’s possible to make currently the antenatal diagnosis of most uropathies malformatives, notably those of kidney, ureters and bladder[3]. Tumoral pathologies are very largely accessible clinically following confirmation by imaging investigations.

The general objective of this survey was to study etiological and therapeutic aspects of urologic 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 was a retrospective multicentric study of cases managed at Paediatric Surgery Service in National Teaching Hospital (CNHU) and in the mother and child hospital of Lagune (HOMEL), Cotonou, over a ten years period between January 2002 and December 2011.

The dependent variable was urologic pathology. The independent variables were the epidemiologic, clinical and therapeutic factors.

The epidemiologic factors included the age and sex of the patients. For the purposes of this study, a new-born baby was any baby aged from 0 to 28 days while infants were children from 29 days to 30 months old. The preschool child is from 30 months to 5 years. The small childhood includes the 5 years old children to 10 years and great childhood those who are 10 to 15 years old.
The clinical factors were the antecedents, the reasons for admission, the delay 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.

RESULTS

From 2002 to 2011, 7914 children were hospitalized in Paediatric Surgery of the two centres, for various pathologies. Among them, we counted 392 files of children carrying a urologic pathology so 5% of frequency. 257 out of 392 files were complete and available for analysis. The incidence was 39 new cases per year, with a range of 21 to 51.

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). 2 patients had intersex disorders.

One hundred and eighty six symptomatic children were seen during consultation. 71 were diagnosed during routine examination at the school or for other affections.

- Delay in Diagnosis

The average duration of symptoms before presentation for consultation was 9± 5.3 weeks and ranged from 1 week to 4 years.

The delay of consultation and the circumstances of discovery are illustrated by table 1.

Figure 1 shows the frequency of the functional signs in 186 symptomatic children presented.

Congenital urologic malformations represented 208 cases (81.3 %). Among them we have 5 cases of bladder exstrophy (figure 2). Neoplastic pathologies, 20 cases (7.9 %), were dominated by nephroblastoma, 16 cases (figures 3A and 3B) including 1 bilateral case. Urologic injury represented 16 cases (6.1 %). Severe injuries as section of glans (figure 4) were observed. The other miscellaneous pathologies accounted for 12 cases (4.7 %).

Table 2 shows the distribution of urologic anomalies diagnosed. We have counted 175 cases (68.2 %) of male genital disorders including 151 cases (58.9 %) of testicular pathologies. The urinary tract was involved in 79 cases (30.8 %).

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

The treatment was surgical in 240 patients (93.5 %), medical treatment was used in 17 cases (6.5 %). Operative procedures are listed in table 3.

- Mode of exit

7 patients died (2.8 %), 4 patients (1.4 %) were escaped out of hospital

- Clinical evaluation

Among the 245 patients evaluated, clinical scores were good in 97.1 % (238 cases) bad in 2.9 % (7 cases).

Figure 1

Table 1: Time of consultation and circumstance of discovery

<table>
<thead>
<tr>
<th>Circumstance of discovery</th>
<th>Number</th>
<th>Delay of consultation</th>
</tr>
</thead>
<tbody>
<tr>
<td>堡垒-type</td>
<td>99</td>
<td>2 weeks 2 days</td>
</tr>
<tr>
<td>Signs</td>
<td>188</td>
<td>3 weeks 1 day</td>
</tr>
<tr>
<td>Total</td>
<td>257</td>
<td>8 weeks 6 days</td>
</tr>
</tbody>
</table>

Figure 2

Table 2: Pathologies according to topography
Figure 3
Table 3: Distribution of various operative procedures performed

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual reduction of parapraxidysyndrome</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Genitoplasty</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Prosthetic vaginoplasty</td>
<td>44</td>
<td>18.5</td>
</tr>
<tr>
<td>Dilatation of the perineal opening (Phimosis)</td>
<td>4</td>
<td>1.5</td>
</tr>
<tr>
<td>Urethroplasty with repair of chordee</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Pyeloplasty</td>
<td>16</td>
<td>6.5</td>
</tr>
<tr>
<td>Hemostasis for circumcision bleeding</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Cystectomy of spermatic tumors</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Meatoctomy</td>
<td>6</td>
<td>2.5</td>
</tr>
<tr>
<td>Ureteral anastomosis excision</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Nephrectomy</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Orchidectomy</td>
<td>105</td>
<td>43.5</td>
</tr>
<tr>
<td>Urethral catheter</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Ureteroplasty for fistula</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>240</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Figure 4
Figure 1: Frequency of the functional symptoms in 186 children

Figure 5
Figure 2: Bladder extrophy

Figure 6
Figure 3A: Photograph of child with abdominal mass

Figure 7
Figure 3B: Abdominal CT Scan of the same child with left large renal mass: nephroblastoma
DISCUSSION

Lacombe [4] 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 hospitals-based and does not necessarily reflect the true figure that a systematic study on a large scale may reveal. Moreover the rarity of the antenatal diagnosis in our setting limits us to only the 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 urinary tract infection is in the purview of Medical Paediatric Service and thus, may not be referred to our service. Gnassingbe et al. [5], in West Africa reported 12.7% patients who had an urogenital malformation.

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 boy.

The high male prevalence was also observed by Fontaine [6] who reported 70 % in France.

In more than a third of the cases, urologic pathology was discovered after the appearance of a clinical sign. This occurred within a mean duration of $8.85 \pm 4.6$ weeks after the first symptoms and was as long as 5 years. This late access to 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 emergency in the management of these uropathies. We similarly noted in our study the rarity of urological 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 1 day) whereas those not presenting with any signs were presented in the three months (12 weeks 2 days) ($p=0.04$).

AKPO et al. [8] in their study reported that urethral pathologies represented 20 % of all paediatric uropathies. Our series (16.8 %) was in agreement.

No urinary tract infection nor lithiasis was found in our survey. The urinary tract infections are considered frequent, especially in the 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: 151 cases (58.9 %). Cryptorchidism was the most frequent pathology, with 101 cases (39.2 %). Fontaine et al. [6] recorded 17.2% in their study. Cryptorchidism occurs in approximately 0.8 to 1.3 % of boys [10]. Hydrocele was the second most frequent pathology in the population. Cryptorchidism, hydrocele, cyst of spermatic funiculus, 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 %). Fiobge et al. [11] had found an incidence of 1 case per year. In our series, we counted 17 cases of tumors; majority of which were nephroblastomas (16 cases). Only one more tumor was found in the urogenital system. The comparison of these two proportions using the test of Fisher gives a $p = 0.000 (< 0.05)$. So we can conclude that renal tumor was more frequent than other tumors of urinary tract. Agossou-vouye et al.[12], reporting on childhood malignancies over a 12 year period identified 17 urogenital tumors 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’ tumor reported in the literature was confirmed in Cotonou (1 case). [1]
Ureteropelvic junction obstructions, occupies the fifth rank in the distribution and was 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 often 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 4th and the 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 a 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 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, one can sate 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 agreed 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]. So their future urologic function could not be evaluated.

**CONCLUSION**

Urologic affections represent 5% of the workload of the Paediatric Surgical Services in Cotonou. The incidence of the uropathies was of 39 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 genitalia area was 69.2 with 1.2 of Intersex disorders; and the urinary tract in the 2 sexes was 30.73%.

**References**

13. MELIN Y, CENDRON J. Malformations vésicales et
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