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Case Report

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Screening of Abnormalities of External Genitalia in Adolescents: About 240 Cases Observed in Public Secondary School of Brazzaville

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Abstract

Introduction: Abnomalities of the external genitalia can impact sexual and testicular function; therefore, a delay in their management can, in some cases, lead to fertility problems. Therefore, we conducted this study, the aim of which was to screen for external genitalia abnormalities in adolescents at public secondary school of Brazzaville.

Patients and methods: This was a prospective, descriptive, and cross-sectional study conducted over a 10-month period. Data collection took place in four public general education middle schools, using random cluster sampling, with parental consent. We studied epidemiological and clinical parameters. Data processing was performed using EPI INFO software version 7.2.4.0 and Excel. The Pearson chi-square test was performed with a significance level of 0.05.

Results: among 768 adolescents examined, 240 presented at least one abnormality of external genitalia (31.2%). Scrotal pain was found in 42.3% of cases, followed by scrotal discomfort (37.5%) and inguinal and/or scrotal swelling (19.4%). The 240 middle school students presented 291 EG abnormalities, and the most common were varicocele (35.7%), inguinal hernia (23.4%), and retractile testicle (14.1%). The main reasons for lack of treatment were ignorance and fear of surgery (40.3% and 21%, respectively).

Conclusion: abnormalities of external genitalia are common among adolescents in school settings, dominated by testicular pathologies, particularly varicocele, which carries risks of impaired reproductive function.

Keywords

Penis, Testicles, Hernia, Varicocele, Adolescent, Brazzaville

Introduction

Abnomalities of the external genitalia (AEG) in boys represent a group of congenital or acquired conditions affecting the penis, scrotum, testicle, and its adnexa [1]. The incidence of external genitalia malformations (hypospadias, ectopic testis) with perfectly differentiated sex is 1/200 to 1/300 births [2]. They can have long-term consequences on sexuality and/or reproduction, and consequently on fertility, as well as psychological repercussions, hence the need for early management [3]. However, the observation of late hospital consultations and the absence of school medicine in our setting led us to conduct this study, the aim of which was to screen for abnormalities of the external genitalia in adolescents in school.

Patients and Methods

This was a cross-sectional, observational study with prospective data collection. It took place from January 1st to November 1st, 2021, a period of ten (10) months in four public secondary school of Brazzaville. It involved male adolescents, aged between 10 and 19 years, who agreed to be examined and whose parents had given their

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Table 1: Distribution of adolescents according to school establishments.

School establishment	N	%	n	%
Amitié	188	24.5	101	53.7
La Paix	210	27.3	53	25.2
Bernadette Bayonne	195	25.4	43	22.1
Pierre Ntsiété	175	22.8	43	24.6
Total	768	100	240	31.2

Table 2: Distribution of adolescents according to level of education of parent.

Level of education of parent	N	%
Primairy	27	11.3
Secondary	170	70.8
Higher	43	17.9

consent. This was a two-stage cluster sampling with simple random selection without replacement. The sample size was calculated using the Schwartz formula and took into account the cluster effect. The sample consisted of 768 individuals. The clinical examination of the respondents was performed in the presence of a parent and under the supervision of a senior pediatric surgeon or urology specialist. The variables studied were:

- epidemiological: Age, parental education level, socioeconomic status

- diagnostic: Functional and physical signs, pathologies.

We also investigated the causes of the lack of care.

Data analysis was performed using EPI INFO software version 7.2.4.0 and Excel. The Pearson chi-square test was applied with a significance threshold of 0.05.

Results

Epidemiological Aspects

Of the 768 adolescents examined, 240 presented with at least one abnormality of the external genitalia, representing a prevalence of 31.2%. The mean age was 14.2 years ± 1.9 (range: 11 to 19 years).

The distribution of adolescents with AEG by school establishment is in the (Table 1).

The majority of parents had a secondary education (Table 2).

The adolescents came from families with a low socioeconomic status in 83 cases (34.6%), a medium one in 142 cases (59.2%), and a high one in 15 cases (6.2%).

Diagnostic Aspects

Pubertal development

Adolescents with AGE were pubertal in 113 cases (47.1%), prepubertal in 77 cases (32.1%), and 50 cases (20.8%) had adult morphology.

Table 3: Distribution of adolescents according to clinical signs.

Signs	N	%
Groin pain	103	42.3
Scrotal discomfort	90	37.5
Inguinal/scrotal swelling	47	19.4
Intrascrotal nodule	17	7.1
Penile deviation	10	4.1
Scrotal emptiness	10	4.1
Urethral meatus ectopia	4	1.7

Signs

Sixty-two adolescents (25.8%) were previously aware of their condition, while 178% were unaware.

We noted intermittent inguinal and/or scrotal pain in 42.3% of cases (Table 3).

Pathologies

The 240 middle school students presented with 291 congenital and acquired external genitalia anomalies. We observed 11 types of AEG, and the three main pathologies were the varicocele (104 cases (35.7%), inguinal hernia (68 cases (23.4%), and retractile testis (41 cases (14.1%)). We had divided the AEG into 3 groups as illustrated in (Figure 1).

One hundred and ninety-three (80.4%) middle school students presented with a single anomaly, we found while pathological associations in 47 cases (19.6%), including 43 cases (17.9%) with two external genitalia anomalies and 4 cases (1.7%) with three external genitalia anomalies.

Figure 2 shows the association of a right hydrocele and a left varicocele found in a 12-year-old adolescent.

Testicular and annexes pathologies

These ranked first with 175 cases (60.4%), including 104 cases of varicocele (59.4%), 51 cases (29.2%) of testicular migration abnormalities, 13 cases (7.4%) of epididymal cysts, and 7 cases (4%) of testicular hypotrophy.

- Varicoceles were grade I in 27 cases (26%), grade II in 62 cases (59.6%), and grade III in 15 cases (14.4%).

- Testicular migration abnormalities were represented by retractile testicles in 41 cases (80.4%) and cryptorchidism in 10 cases (19.6%).

Pathologies of the patent processus vaginalis

Patients of the peritoneal-vaginal canal ranked second with

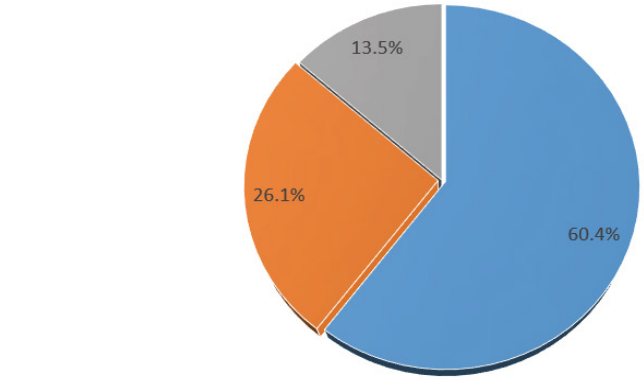


Figure 1: Distribution of cases according the group of AEG.

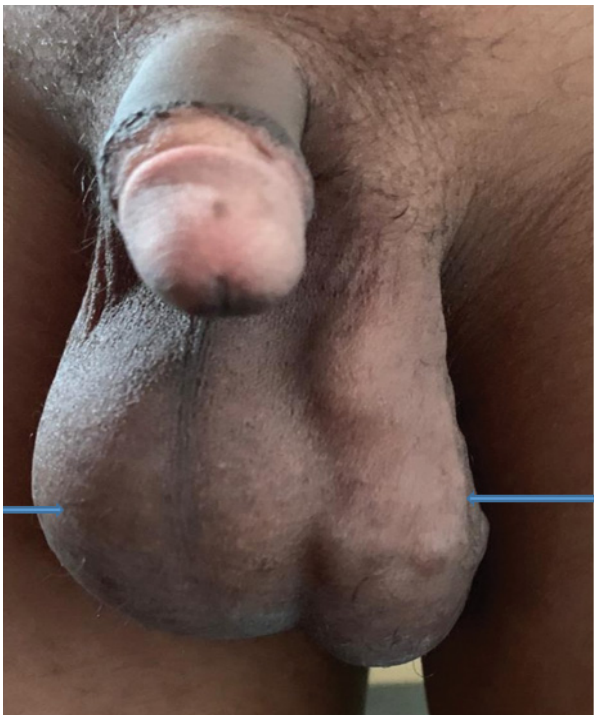


Figure 2: An association of a right hydrocele (a) and a left varicocele grade III (b) in a 12-year-old adolescent.

76 cases (26.1%); these included inguinal or inguinoscrotal hernias with 68 cases (90%), hydroceles with 4 cases (5%), and spermatic cord cysts with 4 cases (5%).

Penile Pathologies

These ranked third with 40 cases (13.7%) and were represented by a micropenis in 20 cases (50%), followed by penile curvature with 16 cases (40%), and hypospadias with 4 cases (10%). Penile curvatures were left lateral in 10 cases, right lateral in 4 cases, and ventral in 2 cases.

All cases of hypospadias were glandular.

Causes of lack of treatment

The lack of treatment for adolescents was often due to lack of awareness of the condition (Figure 3).

Discussion

Epidemiological aspects

In our study, 31.2% of the adolescents examined presented with at least one abnormality of the external genitalia. Our prevalence is close to that of Adekanye, et al. [4], who found 36.2% in primary school children, while some authors report a lower prevalence, such as Fiogbé, et al. [5] and Ghazzel, et al. [6], with 9.29% and 8.2%, respectively. This difference could be explained by methodological differences related to the age range studied and/or sample size. In our series, adolescents with AGE had a mean age of 14.1 ± 1.97 years (range, 11 to 19 years), which is close to the result of Fiogbé, et al. [5], with a mean age of 15.00 ± 2.30 years, ranging from 11 to 19 years.

Parental socioeconomic and educational levels

In our study, more than half of the adolescents (59.6%) with AEG had an average socioeconomic level and 34.2% had a low level. Fiogbé, et al. [5] reported a low socioeconomic level in 76.68% of cases in their series. Most parents had an average secondary education level.

Diagnostic aspects

Pubertal development

Among the adolescents with AEG, nearly half (47.1%) were pubertal and 32.1% were prepubertal. Our results are similar to those of Fiogbé, et al. [5] who found more clinically visible genital abnormalities in pubertal adolescents (87.4%) than prepubertal adolescents (12.6%).

Clinical signs

Scrotal pain in 42.3% of cases, followed by scrotal discomfort (37.5%) and finally inguinal and/or scrotal swelling

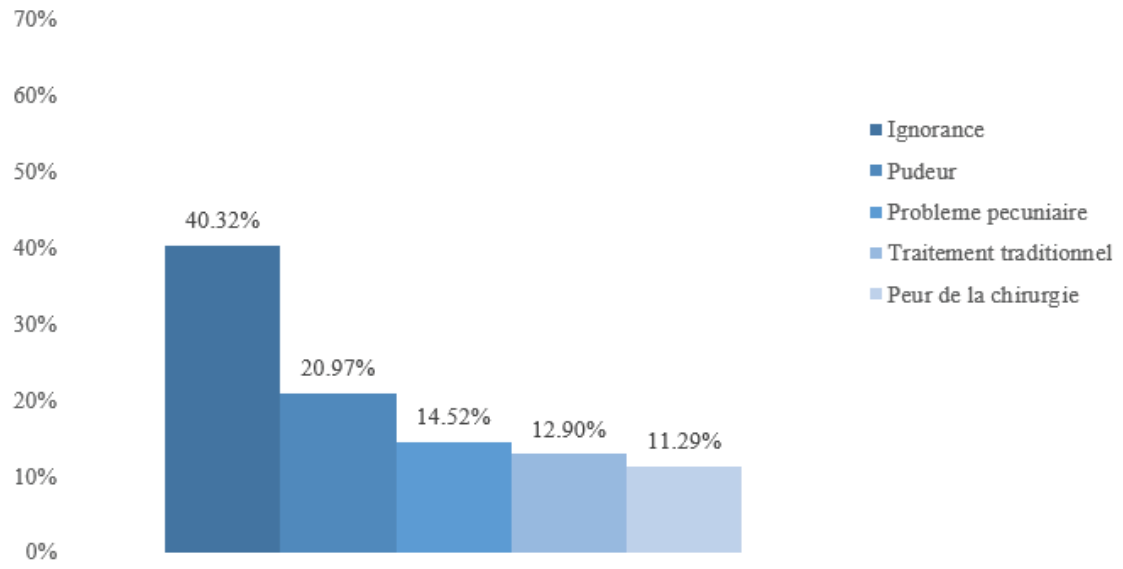


Figure 3: Distribution of cases according to the reason of delayed consultation.

with 19.4% dominated them. Fiogbé, et al. [5] had found scrotal pain, discomfort and swelling in 13.44%, 16.60% and 15.02% of cases respectively.

Pathologies

In our study, 19.6% of middle school students had more than one AGE, Adekanye, et al. [4] and Fiogbé, et al. [5] reported 5.28 and 8.30% respectively. Overall, eleven types of AGE were found, the most common being varicocele with a frequency of 35.7%, followed by inguinal and/or scrotal hernia with 23.4%. These results are similar to those of Fiogbé, et al. [5], while Ghazzel, et al. [6] and Gooran, et al. [7] reported more cases of inguinal hernia than varicocele. Our study focused on adolescents (10-19 years old) while that of Gooran, et al. [7] concerned a younger population between 7 and 12 years old; which explains the low frequency of varicocele in their study because it is rarely observed before puberty [8].

Pathologies of the testicle and its annexes occupy the first place in AOGE in middle school students.

Varicocele is a dilation of the veins of the pampiniform plexus secondary to valvular dysfunction, it is rare in children, its frequency increases with age to reach 15% in adolescence [8]. It is most often discovered incidentally during a systematic clinical examination. It is the most common cause of male infertility [8,9]. We found a predominance of grade 2 varicocele with (59.6%), as reported by Fiogbé, et al. [5] with 44% However in the literature, grade 1 is more frequent (10%), followed by grades 2 and 3 with respectively 1.7% and 1% of adolescents [9]. Varicoceles can lead to testicular atrophy and it is estimated that 15-20% of men with varicoceles suffer from sterility [8,9].

The frequency of cryptorchidism in our series, 3.4% of middle school students, is higher than that reported by Sano, et al. [10] and Gueye, et al. [11] with 1.2% and 1.41% of children examined, respectively. This difference can be explained by the methodology; the series of Sano, et al. [10] was larger with 7334 children aged 2 to 18 years examined. The delay in diagnosis and management of testicular positioning anomalies is criticized in several african series [10-12], while management is earlier in the West [13].

Pathologies of the patent processus vaginalis (PPV) represent the 2nd group of AGE pathologies found in middle school students, with a frequency of 26.2%.

Inguinal or inguinoscrotal hernia is the most frequent pathology with 68 cases (90%), followed by hydrocele (5%) and spermatic cord cyst (5%). These are the most frequent surgical pathologies in children [14-17]; because only 18% of full-term children would have their peritoneal-vaginal canal closed at birth [14]. Indeed, according to Rahman [18], the prevalence of PPV would be nearly 80% in full-term newborns and the peritoneal-vaginal canal can still close spontaneously after birth. Of these 3 nosological entities, inguinal hernia is the most serious because it can be complicated by strangulation with the risk of intestinal and testicular necrosis [14].

Penile pathologies represent the third cause of AOGE in our study. In the United States, the incidence of penile anomalies is around 45-85/10,000.

Micropenis is the first penile pathology that we report. It is a penis of normal structure with a length < 2.5 SD below the average for age [18]. It is linked to defects in the secretion or action of testosterone. Micropenis must be treated to ensure normal urination, normal sexual intercourse and a good self-image [19]. Its incidence in the United States is 1.5 per 10.000 boys [20].

Congenital penile curvature represents the 2nd cause of penile pathologies in our study. Of 17 cases of objectified penile curvature, we found 15 lateral curvatures and 2 ventral curvatures were lateral; Adekanye, et al. [4] reported 37 cases of penile curvatures including 31 lateral, 2 dorsal, 1 ventral. Congenital penile curvature, uncommon (37/100.000),

results from an asymmetry of development of the corpora cavernosa and sometimes associated with the urethra. It is not bothersome up to 20° angulation, but can become an obstacle to sexual life beyond this angulation [21].

For hypospadias, all was balanic. Ghazzel, et al. [6] reported 81.4% of glandular hypospadias; Yegane, et al. [22] found 64% of balanopreputial hypospadias and 36% of balanic hypospadias. Fiogbé, et al. [5] found 6 cases of hypospadias including 3 balanic, two anterior penile and one middle penile. Hypospadias is the most common malformation of the urethra in boys with 1 case/300 [23]. The predominance of distal forms reported by the different authors is explained by by the facts that balanic and balanopreputial forms are more frequent and represent 50% of cases [24] and that being minor they can go unnoticed or not be considered pathological. Odzébé, et al. [25] found an average age of 5.2 years at the time of diagnosis while in developed countries it is 16-24 months [23].

Causes of lack of care

In our study, 40.3% of parents were unaware of their children's condition. Yegane et al. [20] reported that 60.1% were. We also noted a lack of parental information related to adolescent modesty (20.9%) and financial problems (14.5%). Fear of surgery also appears to be a barrier to care. With all the consequences that these AEG can cause, such as potentially fatal complications such as hernia strangulation or cancer, or functional ones such as infertility or sexual dysfunction with a significant risk of psychosocial repercussions, the lack of care can be considered a form of neglect or even abuse [26]. It is also important to highlight the role of the system in the lack of medical checkups in public schools on the one hand and social security coverage for disadvantaged populations on the other.

Conclusion

Anomalies of the external genitalia are common among adolescents in school settings in Africa, particularly in Brazzaville. Varicoceles and inguinal hernias are the most common in our setting. Their presence in this age group is explained by parental negligence, ignorance, and lack of financial means, on the one hand, and by the lack of social and health coverage and school medicine, on the other.

Conflict of Interest

The authors declare that they have no conflict of interest.

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