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Child and adolescent varicoceles in the Guinean school environnement: frequency and clinico-pathological aspects

Abstract

Objective: Determine the frequency and clinicopathological aspects of varicocele in children and adolescents in Guinean schools.

Patients and methods: This is a cross-sectional descriptive study conducted under the supervision of the National school and university health services departments in schools of the five districts of Conakry in Guinea. It was a comprehensive sampling of all students present at the time of the study in randomly chosen schools on a nominative list. The variables studied were of epidemiological and clinical. The varicocele were graded using the Amelar Dubin classification.

Results: From the 10310 children and adolescents examined, 503 or 4.8% had varicocele, with 28.2% of children and 71.3% of adolescents. The mean age of students was 11.5 years, ranging from 6 to 17 years. Varicocele were left sided in 87.7% of cases and a prevalence of varicocele grade II and III with 65% and 23% of cases was noted. Testicular hypotrophy coexisted with varicocele grade II in 64.3% of cases. The varicocele had a clinically silent progression in 88.3% of cases and was incidentally diagnosed during the investigation in 98% (n=493) of cases.

Conclusion: Varicocele in children and adolescents is a significant pathology in schools. It is mostly discovered incidentally during routine examination, indicating a silent mode of progression frequently associated with testicular hypotrophy and subsequent infertility.

Keywords: varicocele, child, adolescent, hypotrophy, testis

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Introduction

Varicocele is defined as excessive dilatation of the pampiniform venous plexus of the spermatic cord that can be clinically detected on physical examination or with the aid of Doppler ultrasound.[1] It has a deleterious effect on the testicular size, function, and fertility over time. Varicocele commonly appears during early puberty.[2] Its incidence in adolescents varies from 9 to 35% in the literature; A rate of 15% is frequently reported, similar to that of the adult population.[3,4] The diagnosis of varicocele in children and adolescent is essentially clinical during a physical examination carried out in a patient in a standing position. It is often discovered incidentally during a routine clinical examination. Rarely an isolated deformation of the scrotum or a functional symptomatology can lead to its discovery. Most Varicoceles are diagnosed in the adulthood for an infertility work up in clinical practice. We don't know how early in age those adults' cases could have been diagnosed by a routine, clinical examination, and the impact of a childhood assessment in the improvement of the spermiological parameters at an adult age. The primary purpose of this study was to investigate the frequency and clinical aspects of varicocele of children and adolescents in Guinean schools. The secondary purpose was to evaluate the relevance of including a systematic Pediatric urologic consult in the National medical school system periodic examinations calendar in Guinea, by knowing it actual incidence in this particular population.

Patients and methods

This is a descriptive cross-sectional study conducted from 20 January to 20 May 2016 with the approval and collaboration of the school and university medical service departments in the five districts of Conakry. The study included all students, children and adolescents, aged between 6 and 17 years, present in class at the time of the survey and who accepted the clinical consult. It was an exhaustive sampling from a nominative list of middle and high schools of the city of Conakry.

We examined 10310 students

A survey sheet was used as a support for the data collection and the collection procedure was done by individual interview and physical examination. The variables studied were epidemiological (the proportion of varicocele among all the students examined, the proportion of varicocele among the pathologies found on every students, the frequency of varicocele for each district of the city and the average age) and clinical (the mode of discovery of varicocele, the of testicular hypotrophy, the grade of varicocele and the presence of any complaint during the progression of varicocele). The age of the students was expressed in years and an age distribution was made with an amplitude of 4. With respect to varicocele grade, the clinical classification of Dubin and Amelar[5] was used:

I. Grade I: Varicocele not visible but palpable during a Valsalva maneuver

II. Grade II: varicocele not visible at rest in orthostatism but easily palpable standing

III. Grade III: varicocele visible and palpable at rest in orthostatism.

The testicular volume was calculated using the Takiara formula: 0.71×length (mm)×height (mm) ×thickness (mm) / 1000. The dimensions of the testicles were manually measured on a supine patient with a soft ruler. Testicular hypotrophy was defined by a testicle whose volume was less than 2 ml in children and less than 3 ml in adolescents. The data were collected and analyzed by the 2007 Office Pack Word and Excel software and presented by numbers, frequencies and means.

Results

Of the 10310 children and adolescents examined, 503 (4.8%) had varicocele. Varicocele accounted for 85.25% of genital conditions encountered during the survey. The frequency of varicocele per district is mentioned in Table 1. The average age of the students was 11.5 years with extremes of 6 and 17 years. The age group distribution is presented in Table 2. Of the 503 students with varicocele, 28.2% (n=142) were children and 71.3% (n=361) were adolescents. Testicular hypotrophy was associated with varicocele in 86.8% (n=437). With respect to topography, varicocele was found on the left in 87.7% (n=441) of cases, bilateral in 11.3% (n=57) and on the right in 1% (n=5) cases. The grade II was predominant followed by grades III and I with 65% (n=327), 23% (n=116) and 12% (n=60) of cases respectively. The distribution of clinical varicocele grades by age groups (child vs. teenager) is presented in Table 3 and Table 4. The testicular hypotrophy observed during the physical examination of the students coexisted with grade II varicocele in 64.3% (n=281) of the cases, grade III in 22.5% (n=116) of the cases, and Grade I in 9.1% (n=40) of cases. Varicocele was accidentally discovered during the survey in 98% (n=493) of the cases, the family or the student himself had already discovered it in 2% (n=10). The progression of the varicocele in the students was asymptomatic in 88.3% (n=444) of the cases, a more or less permanent discomfort was present in 9.7% (n=49) of the cases and a permanent discomfort was noted in 2% (n=10) of cases.

Table 1 Frequency of varicocele by district

	Total population per district		Number of cases of varicocele	
Communes		**Percentage**		**Percentage**
Matam	2000	19.39	60	11.92
Ratoma	1800	17.45	72	14.31
Kaloum	1980	19.2	99	19.68
Dixinn	2130	20.65	104	20.7
Matoto	2400	23.27	168	33.39
Total	10310	100	503	100

Table 2 Age distribution of varicocele in the population

Age interval	Number	Percentage
9-Jun	47	9.36
13-Oct	210	41.74
14- 17	246	48.9
Total	503	100

Mean=11±3.2 ans

Table 3 Grade distribution in children

Grades	Number	Percentage
I	40	28.18
II	92	64.78
III	10	7.04
Total	142	100

Table 4 Grade distribution in adolescents

Grades	Number	Percentage
I	20	5.55
II	235	65.09
III	106	29.36
Total	361	100

Discussion

Varicocele of the child and the adolescent has been under-reported, and its actual incidence tends to approach that of the adult in the recent literature. An exhaustive sampling of student drawn from a list of schools in the five-urban district of the city of Conakry was conducted. The sample was representative of all students in the city of Conakry. However, the absence of an ultrasound examination of the scrotal content in order to look for an infra-clinical varicocele and evaluated more precisely testicular volume, constitutes one of the main limits of this study. During our investigation, varicocele of children and adolescents accounted for 4.8% of all pathologies found in the students examined. This frequency is close to that found by Fiogbé et a.,[6] in a study carried out in Benin on clinically visible uro-genital malformations in adolescent children in the city of Cotonou, where varicocele was the most common pathology with 5.47% of cases. On the other hand, in another screening study of 4067 adolescents, 598 cases of varicocele were reported by Tauber et al.,[7] in Austria, a frequency of 14.70%. Although occupying the first place among the genital pathologies encountered in the survey with 85.25% of cases, varicocele is still an unknown disease in the general population partly because of it clinically silent progression.

There is a number of report of Varicoceles in children and adolescents in the literature. Most studies did include a relatively smaller number of patient (less than 100) and the cases were diagnosed in a hospital setting.[1–3] To our knowledge, our study includes the largest sample of cases of varicocele (503 cases over 10310 patients). The use of the database of the National School Medicine Department allowed us to have access to a large number of subjects and younger population than most published studies in the western literature.[6] The

average age in our series was 11.5 years and 48.9% of the students were between 14 and 17 years old. These results are similar to those of Nyrady et al.,[8] who found a mean age of 11.5 years with extremes of 7 and 16 years. On the other hand, they remain lower than those found by Becmeur et al.,[9] and Costabile et al.,[10] with a mean age of 15 years and extremes of 10 and 20 years for the first and 14 years with extremes of 9 and 19 years for the latter. The predominance of students aged between 14 and 17 years is explained by the fact that the incidence of clinically detectable varicocele is higher during puberty than before. The actual incidence of varicocele in children and adolescents is likely to be higher than that reported because most of these varicoceles are asymptomatic and the majority of these are incidentally discovered during routine physical examinations.

The predominance of left sided varicocele is noted in many studies including those of Fiogbé et al.,[6] Nyrady et al.,[8] and Lopez et al.,[11] found that all patients in their respective series had left varicocele. The left spermatic vein drains into the left renal vein with an acute angle, in contrast to the right spermatic vein which drain directly in the Inferior Vena Cava, making it less likely to be affected by a primary varicocele.[11] A right varicocele is usually a redflag for a renal malignancy occurrence. Grade II varicocele was the most common with 65% of cases in our series. Fiogbé et al.,[6] also found a predominance of grade II varicocele with a frequency of 44.3%. In the Tekgul et al.,[12] study 70% of varicoceles diagnosed in adolescents were grade II and III.

In our study, testicular hypotrophy was the most predominant clinical finding with 86.87% of cases, in accordance with the finding noted by Koyle et al.[13] (81.5% testicular hypotrophy in a study of 103 varicocele).

Testicular hypotrophy is a well-known consequence of varicocele not only in adults but also in adolescents[13,14] and its frequency range from 29 to 87%.[15–18] This wide range of frequency is related to the variability of criteria defining testicular hypotrophy, and the great number methods to measure the testicular volume. In our study we used the Amelar Dublin classification because it is a clinical classification, which is in line with the only investigation we used in our setting: The clinical examination.

The measurement of testicular volume in search of hypotrophy is an essential step in the management of a teenager with varicocele. The volume of a normal testicle before puberty is 1 to 2 ml. A volume greater than 3 ml define the beginning of puberty. During puberty, the testicular volume increases. According to Daniel et al.[19] large individual variations in the kinetics of testicular growth exist because testicular volume appears to correlate better with the development of pubic hair and genitals than with height, weight, and age.

Still, there are numerous studies that confirm the reversibility of ipsilateral volume loss in adolescents with varicocele after treatment.[20,21] In a large cohort, Zampieri et al.[22] observed that all cases of spontaneous reflux of the testicular vein were associated with testicular hypotrophy. This is confirmed in our study in which all observed testicular hypotrophies were associated with grade II and III varicoceles. In addition, Mori et al.[23] showed that the grade of varicocele was proportional to ipsilateral testicular hypotrophy. This testicular hypotrophy may subside after treatment because there is a rapid increase in testicular volume during adolescence that is related to an increase in seminiferous tubule diameter and germ cell count.[24] Thus, failure of testicular growth secondary to varicocele is associated with a decrease in sperm count.[25] With regard to the long clinically silent progression, Allouch et al.[26] and Rabii et al.[27] noted respectively 19.40% and 12.5% functional impairment in their series.

The real main problem posed by varicocele of the child and adolescent remains that of its early management. Given the lack of evidence that early treatment of varicocele in children and adolescents would provide a better outcome in terms of subsequent fertility, a more conservative non-surgical approach is advocated by some author.[28,29] The results of our study lead us to formulate recommendations both diagnostically and therapeutically, taking into account our working context. School medical services must include a pediatric urologist consultant in his annual screening team to detect varicocele cases on physical examination. A testicular ultrasound with Doppler study of the spermatic vessels should be performed in all children and adolescents with varicocele. A treatment will be recommended in the presence of a palpable bilateral varicocele, a symptomatic varicocele, a large varicocele with significant ipsilateral testicular hypotrophy, and any abnormality of spermiological parameters in older adolescents despite assertion by numerous studies that spermiological parameters appear less disturbed between 12 and 17 years of age in adolescents with varicocele.[30]

This treatment, which must be done in a specialized environment (pediatric urology), must be microsurgical using optical magnifying glasses. The use of optical magnification glasses would help reduce the rate of recidivism to less than 10%.[31] Spermatic venography with embolization, which remains the reference treatment,[32] should be considered in our structures in the near future. The indication of systematic preventive surgery requires studies showing an improvement in the parameters and morphology of spermatozoa after varicocelectomy in children and adolescents which needs a longer follow-up of our patient to confirm the value of early detection and preventive surgery.

Conclusion

This very large survey showed that varicocele of the child and the teenager constitutes a significant pathology in Guinean school environment. The disease and its progression are clinically silent in most cases. An increased awareness of this condition, with its negative impact on the child's or adolescent's subsequent fertility, should be organized through information, education and communication sessions. In addition, systematic screening by school doctors and family physicians for appropriate care and adoption of national recommendations on the diagnosis and treatment of these children and adolescents before adulthood are necessary.

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Conflicts of interest

The author declares there is no conflict of interest.

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