

Genital abnormalities and groin hernias in elementary-school children in Aqaba: an epidemiological study

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تشوهات الجهاز التناسلي والفتوق الأربية بين تلاميذ المدارس الابتدائية في العقبة: دراسة وبائية
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خلاصة: تم بحث مدى انتشار الفتوق الأربية وتشوهات الجهاز التناسلي بين الأطفال في جنوب الأردن. فأجريت فحوص سريرية للمناطق الأربية لدى 1748 صبياً تتراوح أعمارهم بين 6 و12 عاماً. واكتشفت تشوهات لدى 320 منهم (18.31%). ومن بين هؤلاء وجد فتق أربي غير مباشر لدى 235 منهم، وخصيات مستوقفة لدى 37 منهم، وخصيات سريعة الانكماش لدى 22 منهم، ومبال تحتاني لدى 13 منهم، وقيلة دوالية يسرى لدى 8 منهم، وقيلة مائية لدى 4 منهم، وحالة واحدة من الأعضاء التناسلية الملتبسة. وقد سجلت عمليات بضع الفتق في 56 من هؤلاء فشلت سليمان من بينها. كما فشلت حالتان من بين أربعة ممن أجريت لهم عمليات تثبيت الخصية. ولم تجر جراحات للمبال التحتاني ولا للقيلة الدوالية في أي من الأطفال. إن الأمر يقتضي تثقيف الجمهور والهئية الطبية حول هذه التشوهات حتى يمكن تحسين عواقبها.

ABSTRACT The prevalence of groin hernias and genital abnormalities in children in southern Jordan was investigated. A total of 1748 boys aged 6–12 years underwent clinical examinations of the groin. Abnormalities were detected in 320 children (18.31%). Of these, 235 had indirect inguinal hernia, 37 undescended testes, 22 retractile testes, 13 hypospadias, 8 left varicocele, 4 hydrocele and 1 ambiguous genitalia. Herniotomies were noted in 56 children with failure in 2 cases. Of 4 children who had undergone orchidopexy, 2 had failed. No child had had surgery for hypospadias or varicocele. Education of the public and medical staff about these abnormalities is needed to improve the outcome.

Les anomalies génitales et les hernies de l'aîne chez les écoliers du primaire à Aqaba: étude épidémiologique

RESUME La prévalence des hernies de l'aîne et des anomalies génitales chez les enfants dans le sud de la Jordanie a été examinée. Au total, 1748 garçons âgés de 6 à 12 ans ont subi des examens cliniques de l'aîne. Des anomalies ont été détectées chez 320 enfants (18,31%) dont 235 avaient une hernie inguinale indirecte, 37 une cryptorchidie, 22 des testicules rétractiles, 13 un hypospadias, 8 une varicocèle gauche, 4 une hydrocèle et 1 des organes génitaux ambigus. Une herniotomie a été détectée chez 56 enfants avec un échec dans 2 cas. Sur 4 enfants qui avaient subi une orchidopexie, 2 ont connu un échec. Aucun enfant n'avait eu de chirurgie pour un hypospadias ou une varicocèle. L'éducation du public et du personnel médical au sujet de ces anomalies est nécessaire pour améliorer le résultat.

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Introduction

Hernia and hydrocele of the inguinal and scrotal region are common congenital disorders in children [1,2]. Hernia can be life-threatening or can result in loss of testis, ovary or a portion of the bowel if incarceration and strangulation occur. Timely diagnosis and operative therapy are important if these complications are to be avoided.

The term "undescended testis" describes all instances in which the testis is not in the scrotum. This must exclude the situation in which the testis is retractile and can be brought in to the scrotum by examination and manipulation. Cryptorchidism is the failure of one or both testes to descend (undescended testis). Some testes follow the normal path of descent but are found in an abnormal position and are considered ectopic. Occasionally a testis is absent (anorchidism). Polyorchidism is a condition in which there may be more than two testes, one of which may be undescended [3]. There is increased incidence of infertility [4,5], trauma, torsion [6-8] and malignant change in patients with undescended testes [9-13].

Hypospadias is a developmental anomaly characterized by urethral meatus that opens on to the ventral surface of the penis, proximal to the end of the glans. The meatus may be located anywhere from the glans along the shaft of the penis to the scrotum or even in the perineum.

Varicocele is defined as a pathological dilation, elongation and varix-like convolution of the spermatic veins that form a pampiniform plexus. The most frequent cause of male infertility is varicocele [14]. It has been suggested that the elevated temperature of the testis caused by the dilated and congested internal spermatic vein disturbs spermatogenesis of the testis [15] and decreases its volume [16].

We aimed to assess the prevalence of such hernias and genital abnormalities in male schoolchildren in the Aqaba region of Jordan.

Subjects and methods

Between November 1997 and December 1997, 1748 boys between 6 years and 12 years of age were examined in schools in the region of Aqaba (population 35 000). The enrolment rate was 95% according to Ministry of Education records. All the children underwent careful clinical examination of the groin region, scrotum and penis before and after straining (cough reflex).

All positive findings were recorded on forms in order to analyse the results and to refer the children for treatment and follow-up.

Results

Of 1748 boys, 1428 (81.69%) had normal examinations. Abnormal findings were detected in 320 children (18.31%). Of the 320 boys with abnormal examinations, 235 had indirect inguinal hernia, 37 had undescended testes, 22 had retractile testes, 13 had hypospadias, 8 had left varicoceles, 4 had hydroceles and 1 child had ambiguous genitalia (Table 1).

Of the 235 children with indirect inguinal hernia, 128 (54.47%) had right inguinal hernia, 61 (25.96%) had bilateral inguinal hernia and 46 (19.57%) had left inguinal hernia. Inguinal hernia associated with undescended testes was found in 28 children (11.91%); inguinal hernia associated with hypospadias was found in 1 child (0.43%); and inguinal hernia associated with left varicocele was found in 1 child (0.43%).

Of the 37 children with undescended testes, 23 had right undescended testis, 7 left and 7 bilateral. Undescended testis associated with indirect inguinal hernia were found in 28 children (75.68%), whereas undescended testis associated with hypospadias was found in 1 child (2.70%).

Of the 22 children with retractile testis, it was on the right side in 5 children, on the left side in 2 and bilateral in 15. Of the 4 children with hydrocele, 2 had right hydrocele, 1 left and 1 bilateral.

Of the 13 children with hypospadias, 2 had proximal hypospadias and 11 had distal hypospadias. None had had surgery for hypospadias. Left varicocele was found in 8 children aged 9–12 years and left varicocele associated with inguinal hernia was seen in 1 child. None had had surgery for left varicocele.

Ambiguous genitalia was found in 1 child who had female-like external genitalia in the form of bifid scrotum, small right testis, undescended left testis, short penis

Table 1 Prevalence of genital abnormalities and groin hernias in 1748 boys aged 6–12 years

Lesion	Right side	Left side	Bilateral	Total no.	%
Hydrocele	2	1	1	4	0.23
Inguinal hernia ^a	128	46	61	235	13.44
Undescended testis ^b	23	7	7	37	2.12
Retractile testis	5	2	15	22	1.26
Varicocele	–	8	–	8	0.46
Hypospadias	Proximal 2	Middle 0	Distal 11	13	0.74

^aIndirect inguinal hernia was associated with undescended testis in 28 children (11.91%)

^bUndescended testis was associated with indirect inguinal hernia in 28 children (75.68%)

Table 2 Results of operations for inguino-scrotal-penile lesions in boys aged 6–12 years

Lesion	Total	Operated		Failed	
		No.	%	No.	%
Hydrocele	4	0	–	–	–
Inguinal hernia	235	56	23.82	2	3.57
Undescended testis	37	4	10.81	2	50.00
Varicocele	8	0	–	–	–
Hypospadias	13	0	–	–	–

with proximal penile hypospadias and morbid obesity.

Of the 235 children with indirect inguinal hernia, 56 had had herniotomies. Surgery had failed in 2. None of the 4 children with hydroceles had undergone surgery. Of the 37 children with undescended testis, 4 had undergone orchiopexy; surgery had failed in 2 (Table 2). Epispadias, femoral hernia and external genitalia tumour were not detected in our study.

Discussion

The incidence of indirect inguinal hernia in the general population is approximately 1%–5% [17]. In some studies, 25% of males and only 2% of females have been found to develop inguinal hernias in their lifetimes [18]. In most studies, the male to female ratio ranges from 8:1 to 10:1. These figures are dependent upon the associated disease and other factors. Incarceration is more common in boys with right-sided hernia [19]. In our study, 13.44% of the male schoolchildren aged 6–12 years had inguinal hernias. Direct inguinal hernia and femoral hernia in children are extremely rare and represent a small percentage in most studies.

The incidence of hydrocele among male infants is largely unknown. Non-communicating hydrocele, unassociated with a patent processus vaginalis does not predispose to hernia. It is very common in newborn males and is self-limiting, usually resolving within 6–12 months [1]. The incidence of isolated (non-communicating) hydrocele in children older than 1 year of age is probably less than 1% [1].

Nondescent of testis in the adult population is not common. Approximately 50% occur on the right side, 25% on the left and 25% bilaterally. This incidence parallels the incidence of inguinal hernia in children

and coincides with the order of testicular descent in that the right testis descends later than the left. Infants born prematurely have an eight times greater incidence of undescended testes than infants born at term [20]. By the time the infant reaches 1 year of age, the incidence is 10 times greater, i.e. incidence is approximately 5.4% in infants born prematurely and 0.5% in infants born at term.

The incidence of undescended testis in neonates followed up to 1 year of age in England and Wales was approximately 0.8% [21]. The orchiopexy rate in England and Wales reportedly more than doubled during 1962–81 [22]. In our study 2.12% of the children had undescended testis. Retractable testes are also more common in premature infants and are not considered a pathological condition. A rate of 1.26% was found in our study.

The incidence of hypospadias has been estimated to be between 0.8 and 8.2 per 1000 live male births [23]. This variation probably represents geographic and racial differences. If all degrees of hypospadias, including the most minor, were counted, the rate would probably be close to 8 in 1000, or 1 in 125 live male births [24].

Varicocele is recognized as one of the most frequent causes of male infertility. The incidence of varicocele in the general population has been estimated to be about 15% [25], whereas about 30% of infertile male patients have been reported to have varicocele [15,26]. In our study, no child under 9 years of age had varicocele, whereas between 9 years and 12 years the prevalence rate was 0.46%. Although the relationship between varicocele and male infertility has not been completely resolved, it is generally accepted that varicocele causes functional disturbances of the testes and that semen quality improves after operative correction of varicoceles [27].

Varicocele is very rare under 10 years. The incidence at 10 years has been reported to be approximately 6% increasing to 15% by age 13 years, which equals the adult incidence [28].

Although we considered using the cough reflex as the method to detect the cough impulse of hernia, it was sometimes difficult to use with children. When it failed, it was followed with palpation of the hernial sac if present. As a result, the inguinal hernia prevalence rate of 13.44% was probably slightly less than the actual figure. A prevalence of hydrocele of 0.23% is feasible and correlates with international figures. In our study, all impalpable testes or those palpable in the inguinal canal which could not be brought to the scrotum were considered undescended, while those testes which could be brought to the scrotum after careful examination were considered retractile. Our rate of 2.12% for undescended testes may be slightly high but is acceptable in comparison with international figures. As retractile testis is not considered to be an abnormal condition, its prevalence of 1.26% might be acceptable. Prevalence of hypospadias of 0.74% correlates with international figures. No cases of middle hypospadias were found in our

study. Our prevalence of left varicocele of 0.46% for the ages 9–12 years is less than that reported for similar age groups elsewhere.

Herniotomies were found to have failed in 2 of the 56 children who had undergone surgery. Orchiopexies were also found to have failed in 2 children. None of the children with hypospadias or with left varicocele had undergone surgery.

A report on the findings of abnormalities was sent to the public schools in the Aqaba region for further management. Another report was sent to school doctors for follow-up.

Conclusion and recommendations

Inguinal hernias and external genital abnormalities are common in children in southern Jordan, affecting 18.31%. There is obviously a delay in the diagnosis and management of children in this age group. Careful screening of children at preschool and school age is necessary to avoid later complications. Increased public awareness and early referral of such abnormalities are very important.

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