

Prevalence of surgical inguino-genital conditions among male kindergartens and primary school children in Mosul city

Abdul Salaam Al-Masri*, Bassam A. Al-Ne`ema**, Khalaf Rasheed*

*Department of Surgery, **Department of Community Medicine, College of Medicine, University of Mosul.

(Ann. Coll. Med. Mosul 2009; 35(2): 134-139).

Received: 12th Aug 2008; Accepted: 10th Feb 2010.

ABSTRACT

Context: Inguino-genital surgical disorders are common problems seen in daily surgical practice. The aim of this study is to determine the main surgical inguino-genital disorders among kindergartens and primary school boys less than 10 years of age in Mosul city.

Methods: A random sample of kindergartens and primary school boys from both sides of Mosul city underwent a cross-sectional study between 1st of Oct. 2004 and 31st of Jan 2005. All boys were examined by specialized surgeons for the presence of surgical disorders in their inguino-genital region. The pathological findings were recorded and diagnosed disorders were further assessed by suitable investigative tools. The parents were informed about their children's disorders and accordingly, a suitable management for each single disorder was discussed with them.

Results: During the study period, 950 children were examined and (125) children were having various inguino-genital disorders. The prevalence of these conditions was (13.2%). The present study showed (7.7%) of the screened children were uncircumcised, (3.2%) were having undescended testes and (1.2%) has inguinal hernia. The surgical conditions were (54.4%) among the age of 6-7 years, (20.0%) among the age of (5-6) years and (1.6%) among the age of (9-10) years. The study revealed that 60% of the undescended testes were on the right side, and (36.7%) on the left side. Moreover (63.67%) of the hernias were right sided and (27.3%) were left sided.

Conclusion and recommendations: Studying male children in schools for any surgical abnormalities, at the inguino-genital areas provides the opportunity for detection of the early conditions, further management of the main surgical cases that need correction and the prevention of any risk of complications.

Keywords: Inguinal, screening, undescended, hernias, uncircumcised.

الخلاصة

تهدف الدراسة الحالية إلى دراسة انتشار الحالات الجراحية الرئيسية في المنطقة المغننية والأعضاء التناسلية بين الأطفال الذكور الذين تبلغ أعمارهم أقل من ١٠ سنوات في رياض الأطفال والمدارس الابتدائية في مدينة الموصل. أجريت الدراسة في الفترة ما بين الأول من تشرين أول ٢٠٠٤ إلى الأول من كانون الثاني ٢٠٠٥. لقد تم اختيار طريقة الدراسة المقطعية في هذا البحث الاستكشافي، وأخذت عينة عشوائية من رياض الأطفال وطلاب المدارس الابتدائية من جانبي مدينة الموصل على ضفتي نهر دجلة. وتم فحص جميع الأطفال في عينة الدراسة من قبل جراحين أخصائيين وسجلت النتائج حسب ما تم اكتشافها بعد استخدام الفحوصات السريرية الدقيقة العامة والموضعية لكل طفل. الأطفال الذين تم اكتشاف الحالات لديهم اجري لهم فحوص تشخيصية مناسبة للتأكد من التشخيص، وتم إخبار ذويهم ومناقشة الحالة معهم لغرض إجراء التدابير المناسبة للأطفال المصابين. خلال فترة الدراسة تم فحص ٩٥٠ طفلاً، وظهر أن ١٢٥ طفلاً منهم كانوا مصابين بحالات جراحية مختلفة ومعدل الانتشار الكلي (١٣,٢%). وأظهرت الدراسة أن ٧,٧% من الأطفال في

عينة الدراسة كانوا غير مختونين و ٣,٢% لديهم خصية هاجرة و ١,٢% لديهم فتق مغبني. وكانت نسب الحالات ضمن العدد الكلي للحالات الجراحية كالتالي: (٥٨,٤%) غير مختون، (٢٤,٠%) خصية هاجرة، (٨,٨%) فتق مغبني، (٤,٨%) خصية راجعة، (٢,٤%) قيلة مائية و (١,٦%) مبال تحتاني. وظهر من الدراسة أن ٥٤,٤% من الحالات هي بين الأطفال ٦-٧ سنوات و ٢٠% بين من هم ٥-٦ سنوات و ١,٦% بين الأطفال ٩-١٠ سنوات. ومن نتائج الدراسة ظهر أن ٦٠% من الخصية غير النازلة كانت في الجهة اليمنى و ٣٦,٧% كانت في الجهة اليسرى. وكذلك كان ٦٣% من حالات الفتق كانت في الجهة اليمنى و ٢٧% منها كانت في الجهة اليسرى. **الاستنتاج والتوصيات:** إن فحص أطفال المدارس ورياض الأطفال يوفر فرصة لتشخيص الحالات ومن ثم الإصلاح المبكر لبعض تلك الحالات ومنع المضاعفات المحتملة ويوفر العلاج للحالات التي تحتاج تدخلا جراحيا مناسباً.

Inguino-genital surgical disorders are problems commonly encountered in daily surgical practice^(1,2). Examples include inguinal hernias, hydroceles, undescended testes..etc. Hernias occur in (1- 4%) of all infants; the incidence may reach (30%) in premature infants (depending on the child's gestational age at birth). One third of all children with hernias presents before six months of age, and (13.44%) of the male school children aged (6-12) years had inguinal hernias⁽³⁾. Most hernias occur in males, with a male to female ratio of (6:1). Female and premature infants of both sexes face a higher risk of incarceration than others, leading to tissue death⁽⁴⁾. Direct inguinal hernia and femoral hernia in children are extremely rare and represent a small percentage in most studies. About (3- 5%) of healthy, full-term babies may be born with an inguinal hernia and one third of hernias of infancy and childhood appear within the first six months of life. In just over (10%) of cases, other members of the family might have also a hernia at birth or in infancy⁽⁵⁾. Infants or children with inguinal hernias need to have surgery as soon as possible due to the increased risk of tissue trapping and damaging of their blood supply. In (9-20%) of affected infants, the intestinal or abdominal tissues may become trapped within the hernial sac and may lead to incarceration or obstruction as their deep inguinal ring is narrow. Most of the time these events occur before the infant is one year old.⁽³⁾ Surgery is the only way of treatment and correction for inguinal hernias. Inguinal hernial repair is one of the most common abdominal hernial surgeries.⁽⁴⁾ The percentage of circumcised male infants varies by geographic location, religious affiliation, and

to some extent, by socioeconomic classification. Circumcision is uncommon in Asia, South America, and Central America, South Africa and in most of Europe⁽⁶⁾. A hydrocele is a collection of fluid in the tunica vaginalis. The typical hydrocele observed at or shortly after birth as a unilateral or bilateral swelling of the scrotum, which may vary in size⁽⁶⁻⁹⁾.

The incidence of undescended testes in neonates until one year of age in England and Wales is (0.8%)⁽⁵⁾. Early diagnosis and management of the undescended testicles are needed to improve clinically early detection of testicular malignancy as well as correction the association of (90%) of patent processus vaginalis, (25%) of hernia and probably preservation of fertility. Operation is recommended at or below one year of age as delays in treatment will permanently affect the intra testicular tissue, lower the rate of surgical success and probably impair spermatogenesis in future⁽⁶⁻⁹⁾. Cryptorchidism is associated with testicular cancer. The stated risk is about (3.6-7.4) times higher than in the general population^(8,9). It has been well documented that men with a history of undescended testicle have a higher than expected incidence of testicular germ cell cancers. While the likelihood of developing testicular cancer probably overestimated in the past, the incidence among men with an undescended testicle is approximately 1:1000 – 1: 2500^(10,11). Although significantly higher than the risk among the general population (1:100,000), this level of risk does not warrant radical therapy, such as removal of all intra-abdominal testes^(12, 13, 14).

Hypospadias is a congenital abnormality by which the external urinary meatus is located anywhere along the ventral aspect of the phallus with or without chordee (bowing of the phallus ventrally); its incidence is about (1: 700 newborn males) ^(1,4,10). Screening of these condition especially inguinal hernias and undescended testes is needed for early management.

The aim of the present study is to measure the prevalence of inguinal surgical conditions among male kindergarten and primary school children aged less than 10 years in Mosul city.

Materials and methods

Official permission was obtained from Nineveh Directorate of Education for conducting of this study, where a list of all schools in both sides of Mosul city was provided from such directorate (n=1230 schools and kindergartens). A sample of 13 primary schools and kindergartens, which forms 1.1% of the total was chosen from the list using systematic sampling randomization. The administrations of the chosen schools were visited and the aim of the study and methods were discussed with them. The agreement of the parents for examination of their children was taken through the kindergartens and the primary school administrations. A special private, warm room was prepared for performing examination of pupils. All children of the chosen classes were assessed.

The adopted study population includes male children of kindergartens and primary schools who were present during the study up to the age of 10 years during the period from 1st October 2004 to 31st January 2005. Examination was carried by specialized surgeons. The groin and genitalia were examined for any evidence of inguinal hernia, undescended testis, hydrocele and hypospadias. Those who have any inguino-genital abnormality, their disorders were recorded according to their age and site.

The scrotal examination was performed by a bimanual technique. One hand at the anterior superior iliac spine that gently sweeps along the inguinal canal, the undescended or ectopic inguinal testicle felt to "pop" under the examiner's fingers. The ectopic testicle

immediately spring out of the scrotum when it released. The retractile testicle on the other hand (that reaches the bottom of the scrotum) will remain momentarily in the scrotum until further stimulation causes a cremasteric reflex. For the examination of hernias, the child examined in erect and supine position. Inspection of groin in standing position reveals whether the lumps extending down to the scrotum, by palpation, getting above the mass as well as transillumination are important signs to differentiate between hydrocele and inguinal hernia, cough impulse is positive in hernia.

A thorough and precise general and local clinical examination were done for those with conditions. Furthermore, they were sent for further investigations to confirm the diagnosis made by the surgeon as ultrasonic examination. The parents were informed about the children's disorders and suitable ways for management were discussed with them.

Results

Table (1) depicts the point prevalence of surgical inguinal conditions among study sample. Out of 950 children examined 125 showed the conditions making an overall point prevalence of (13.2%). Uncircumcised children form (7.7%), those with undescended testes (3.2%), inguinal hernia (1.2%) and the rest formed a minority of (1.1%).

Table (2) reveals the inguino-genital disorders distributed according to age, where the disorders were present in (54.4%) among the age of (6-7years), (20.0%) were at age (5-6 years) and (1.6%) at age (9-10 years).

It is also seen that 60.3% of uncircumcised boys, 46.6% of undescended testes and (54.5%) of inguinal hernias were at age (6-7 years). One fourth of the boys with undescended testes and one third of those with inguinal hernias were in the age of (<5 years). This table also shows that the point prevalence among the children under five years of age examined is 23.1 %, while lower figures were reported among the older age groups.

Table (3) shows distribution of study sample according to site of the condition: right, left or bilateral; (excluding uncircumcision and hypospadias n=75).

It is shown that (60.0%) of the undescended testes were on the right side, and (36.7%) on the left. Moreover (63.6%) of the hernias were right sided and (27.3%) were on the left. The

table also shows that (83.3%) of the retractile testes were on the right side and (16.7%) were on left.

Table (1): Point prevalence of surgical inguinal conditions among study sample (n=950).

	The condition	Point prevalence (%)	
		percentage among children having inguinal disorders n=125	Percentage among studied children n=950
1.	Uncircumcised n=73	58.4	7.7 %
2.	Undescended testes n=30	24.0	3.2 %
3.	Inguinal hernia n= 11	8.8	1.2 %
4.	Retractile testes n=6	4.8	0.6 %
5.	Hydrocele n= 3	2.4	0.3 %
6.	Hypospadias n=2	1.6	0.2 %
	Total	100.0	13.2 %

Table (2): Distribution of the inguino- genital disorders according to age.

The disorder	Age in (years)						Total
	<5	5-6	6-7	7-8	8-9	9-10	
1-Uncircumcised	6 8.2	15 20.5	44 60.3	5 6.8	3 4.1	0	73 58.4
2-Undescended testes	7 23.3	7 23.3	14 46.6	0	0	2 6.7	30 24.0
3-Inguinal hernia	4 36.5	0	6 54.5	1 9.1	0	0	11 8.8
4-Retractile testes	0	3 50.0	0	2 33.3	1 16.7	0	6 4.8
5-Hydrocele	1 33.3	0	2 66.6	0	0	0	3 2.4
6-Hypospadias	0	0	2 100	0	0	0	2 1.2
Total cases	18 14.4	25 20.0	68 54.4	8 6.4	4 3.2	2 1.6	125 100
Total examined Point prevalence %	78 23.1	195 12.8	473 14.4	64 12.5	39 10.3	101 2.0	950 100

Table (3): Distribution of site of the inguino- genital disorders among studied sample according to site.

	The disorder	The site						Total
		Right		Left		Bilateral		
		No.	%	No.	%	No.	%	
1.	Undescended testes	18	60.0	11	36.7	1	3.3	30
2.	Inguinal hernia	7	63.6	3	27.3	1	9.1	11
3.	Retractile testes	5	83.3	1	16.7	0	0.0	6
4.	Hydrocele	0	0.0	2	66.7	1	33.3	3
	Total	30	24.0	17	13.6	3	2.4	50*

* The rest of total 100% is due to non-circumcised and hypospadias.

Discussion

Examining the inguinal region is valuable in detecting common surgical inguino-genital disorders. Some of them may lead to complications if left untreated as in inguinal hernias; others may lead to psychological trauma if uncorrected as in hypospadias. Others carry the risk of malignant changes such as undescended testicle⁽⁸⁾. In Jordan in 2000, a study of (1748) boys, between the ages of (6-12) years, performed to investigate their genital abnormalities, it demonstrated the presence of such abnormalities in (18.31%) of examined children. Of these (235) patients had inguinal hernias, (37) undescended testes, (22) retractile testes, (13) hypospadias, eight left varicocele and four hydrocele.⁽⁴⁾

The prevalence of indirect inguinal hernia in general population of children is approximately (1- 5%)⁽⁹⁾, in the present study the discovered inguino-genital abnormality was (58.4%) of all the surgical conditions, whereas the prevalence of inguinal hernia is (1.2%) among kindergarten and primary school children less than 10 years of age. Uncircumcised children were (7.7%) of the examined children. In the present study the prevalence of undescended testes was (3.2%) and (24.0%) of total inguino-genital disorders. Two thirds of them were on the right side, this fact was also seen in other similar studies.⁽¹¹⁻¹³⁾

The trend to perform orchidopexy at younger ages may reduce the risks associated with undescended testes as torsion or trauma. Such operation will make the testis easily accessible for early detection of any malignant

degeneration later on, and it may help the chance of being fertile.^(14, 16)

Bartone & Schmidt (1985) study revealed half of undescended testes were between 6-7 years of age⁽¹⁷⁾. Even when bilateral undescended testes are treated early the patient generally has a poor chance of being fertile⁽¹⁸⁾. Operation for undescended testes is not recommended beyond one year of age due to the irreversible changes within the testicular tissues and probably impair spermatogenesis later on⁽¹⁸⁾.

Retractile testes are not considered a pathological condition and it was found to be 0.6% in the present study. The retractile testicle is the most important differential diagnosis of undescended testes to distinguish on physical examination as far as no hormone or surgical therapy is required⁽¹⁷⁾. In the present study, hydrocele was seen in 0.3% of children and mainly at age less than 5 year and between the ages of 6-7years, left side is more than right. In a study done by Skoog SJ, Conlin MJ., they found that the incidence of isolated hydrocele in children older than one year of age is probably less than 1%⁽²⁾. The present study concludes that there is no obvious variation among the study sample, in comparison with other studies and the scientific facts in the text, relation to the prevalence, site, age and types of the surgical abnormalities in the inguino- genital areas. Nevertheless, the implementations of further cross sectional studies among the school children are important. In order to promote the school health education more efforts and programs should be directed to conduct early

screening of such surgical disorders among children of different ages to avoid the delay in their clinical diagnosis, surgical management and possibly help reduce the risks of their complications.

References

1. Ashcraft KW, Holder TM. Pediatric surgery, 2nd ed. Philadelphia, WB Saunders Company 1993; 293–297.
2. Skoog SJ, Conlin MJ. Pediatric hernia and hydrocele. The urologist's perspective. *Urologic Clinics of North America* 1995; 22(1):119-130.
3. Aiken JJ. Inguinal hernias. In RE Behrman et al., eds., *Nelson Textbook of Pediatrics*, 17th ed. Philadelphia: WB Saunders 2004; 1293–1297.
4. Al-Abbadi K., Smadi S.A.. Genital abnormalities and groin hernias in elementary-school children in Aqaba: an epidemiological study *Eastern Mediterranean Health Journal* 2000; 6(23): 293-298.
5. Giwercman A, Grindsted J, Hansen B, Jensen OM, Skakkebaek NE. Testicular cancer risk in boys with maldescended testis: a cohort study. *J Urol.* 1987; 138: 1214-1216.
6. David J. Pediatric hernia and hydrocele principle of general surgery (Schwartz) 8th Ed Philadelphia: Saunders 2005; 1505.
7. Cortes D, Thorup JM, Visfeldt J. Cryptorchidism: aspects of fertility and neoplasm. A study including data of 1,335 consecutive boys who underwent testicular biopsy simultaneously with surgery for cryptorchidism. *Horm Res* 2001; 55:21-27.
8. Bani-Hani KE, Matani YS, Bani-Hani IH. Cryptorchidism and testicular neoplasia. *Saudi Med J* 2003; 24:166-169.
9. Sonnino RE. Reece R. Hydroceles. In: *Manual of Emergency Pediatrics*, 4th ed. Philadelphia: WB Saunders Company 1992; 261.
10. Hardner GJ, Bhanalaph T, Murphy GP. Carcinoma of the penis: analysis of therapy in 100 consecutive cases. *J Urol.* 1972; 108:428-430 [Medline].
11. Silver RI, Docimo SG. Cryptorchidism. In: Gonzales ET, Bauer SB, eds. *Pediatric Urology Practice*. Philadelphia: Lippincott-Raven 1999; 499.
12. Cortes D, Thorup JM, Visfeldt J. Multinucleated spermatogonia in cryptorchid boys: a possible association with an increased risk of testicular malignancy later in life?. *APMIS* 2003; 111:25-31.
13. Møller H. Epidemiological studies of testicular germ cell cancer (Thesis). Thames Cancer Registry, King's College London 2000;1-87 cryptorchidism.
14. Pinczowski D, McLaughlin JK, Lackgren G, Adami HO, Persson I. Occurrence of testicular cancer in patients operated on for cryptorchidism and inguinal hernia. *J Urol.* 1991;146:1291.
15. Circumcision Policy Statement. *American Academy of Pediatrics* 1999; 103(3): 686-693.
16. Skakkebaek NE. Carcinoma in situ of the testis: frequency and relationship to invasive germ cell tumors in infertile men. *Histopathology* 1978; 2:157-70. [Medline]
17. Bartone FF, Schmidt MA. Cryptorchidism: incidence of anomaly in 50 cases in *Smith General Urology* 12th Ed Lange medical publications 2003; 446.
18. Pryor JP, Cameron KM, Chilton CP, Ford TF, Parkinson MC, Sincokrot J, et al. Carcinoma in situ in testicular biopsies from men presenting with infertility. *Br J Urol.* 1983; 55:780-4. [Medline]