# CRYPTORCHIDISM IN LOCAL ARAB POPULATION IN LIBYA

Salim Mahdi Albassam*

## ABSTRACT

**Background: Cryptorchidism is the most common genital problem encountered in pediatrics, it was first described by Hunter in 1786 and despite more than 100 years of research the anomaly is still not well defined and controversial.**

**Objective: To determine the incidence of undescende testes in pupils of age group between 6-15 years in close Arab society, in Libya.**

**Setting: Eleven primary schools in the city and outpatient department in Ibn Senaa University Hospital, Sirte, Libya.**

**Methods: Between March and April 2001 a cross-sectional study involving 7301 male pupils of age group between 6-15 years were screened for presence of undescended testes. Permission was sought from school principles. The pupils were belong to close tribal society with two major clans, the marriage is usually and exclusively within the clan and the people claimed descent from common ancestor. Pupils were placed in frog leg position for examination and the testes milked down to the scrotum to eliminate the possibility of retractile testes. The positive cases were informed to report to the outpatient department for treatment.**

**Results: From the 7301 pupils screened, 172 were found to have undescended testes accounting for about 2.3%. The unilateralism form the majority of the positive cases with only slight deference between left and right. Cases of bilateralism were small in number. The percentage of the positive cases in each school ranging between 0.92% to 3.2%. Small number of positive cases associated with hernias and retractile testes in the sound side or hernias in the affected side, in less than one third of the positive cases the undescended testes were located in the inguinal canal and the majority of them were not palpable.**

**Conclusion: Figures obtained from our study compared with other different studies in fostering the hypothesis of gradual increase in incidence of the cryptorchidism during the past decades. The prevalence of the cryptorchidism is variable specially in close and related society like that of our study.**

## INTRODUCTION

The term cryptorchidism is applied to developmental defect characterized by failure of one or both testes to descend into the scrotum and remain in the inguinal canal called also undescended or retained testes. The retractile testes (testis redux) mean fully descended testes that move freely between the scrotum and inguinal canal owing to an exaggerated cremastric reflex. Ectopic testis describes a testis which has become lodged in some abnormal location after emerging from the external inguinal ring.[1,2] Cryptorchidism is the most common genital problem encountered in pediatrics, It was first described by Hunter in 1786 and despite more than 100 years of research the anomaly is still not well defined and controversial. Understanding the abnormalities of morphogenesis, the molecular and hormonal milieu are vital to the diagnosis of this extremely common abnormality.[3,4] Cryptorchidism shows familial clustering and increases in first degree relatives, suggesting that genetic and/or environmental factor, maternal hormones, geographical variability may contribute to the etiology.[5,6] Current theories of etiology emphasize significant genetic contribution such as insulin like factor 3 and relaxin/insulin like family peptide receptor 2.[7] Epidemiological data claimed that fetal growth restriction, maternal factor like smoking, alcohol use, gestational diabetes and exposure to environmental chemicals and intrauterine insemination may also play role.[7-10] There is possible association between congenital cryptorchidism and fetal exposure to antiandrogenic Dichlorodiphenyle-trichloro-ethylate (DDG), polychlorinated biphenyle (PCB3) and Dibutylphthalate and metabolite monobutylphthalate (MBP) through mother colostrums.[11,12] Maternal dietary factors may

*Department of Surgery, College of Medicine, University of Basrah, Iraq.

play part like bioaccumulation of contaminants like fish and liver, pesticides like market fruits and potentially toxic food component like smoked products.[13] Accurate diagnosis is imperative to minimize the long term sequelae of infertility and cancer.[14] Physical examination (for palpable testes) and laparoscopy (for impalpable one) has proven to be the accurate diagnostic modalities.[15,16]

## METHODS

Between March and April 2001, 7301 male pupils (in eleven schools) of age group between 6-15 years were screened. Each school has two duty shifts, the morning one is between 8 am-12 pm, the afternoon shift is between 2-5 pm (total daily duty time seven hours). The society in the city close tribal with two major clans in which people claimed descent from common ancestor, the marriages usually and exclusively within the clan. Pupils were placed in the frog leg position for examination, this position is important in fatty children with fatty infiltration of the scrotum, the testes milked down to the scrotum to eliminate the possibility of retractile testes. The positive cases were informed to report to the outpatient department for treatment, the included figures were finally determined.

## RESULTS

From the 7301 pupils screened 172 found to have undescended testes accounting for about 2.3%, The location of right or left is shown in (Table-1), the unilateralist form the majority of the positive cases with slight deference between left and right distribution, 44.19% and 42.44% respectively and 12.21% bilateral. Table-2 shows the number of positive cases in each school screened, the relatively small number of positive cases in school number two in the table may be attributed to large number of foreign pupils and pupils from outside the city included in this school. Table-3 shows the number of hernias and contralateral retractile testes associated with the undescended testes, the cases of hernias were 3.49% on the site of undescended testes and 1.16% on the sound site. Clinically, 37.8% of undescended test were arrested in the inguinal canal.

***Table 1. Location of missing testes***

| Site | No. | % |
|---|---|---|
| **Left** | 76 | 44.19 |
| **Right** | 73 | 42.44 |
| **Bilateral** | 21 | 12.21 |
| **Ectopic** | 2 | 1.16 |
| **Total** | 172 | 100 |

***Table 2. Positive cases in each school (all schools contain small number of foreign and local pupils from outside the city, however they concentrate more in school number two).***

| Schools | No. of pupils | No. of positive cases | % |
|---|---|---|---|
| **School 1** | 819 | 20 | 2.44 |
| **School 2 (includes large number of foreign pupils)** | 1153 | 20 | 1.73 |
| **School 3** | 794 | 17 | 2.14 |
| **School 4** | 877 | 21 | 2.34 |
| **School 5** | 420 | 11 | 2.61 |
| **School 6** | 597 | 16 | 2.68 |
| **School 7** | 589 | 10 | 1.69 |
| **School 8** | 859 | 20 | 2.32 |
| **School 9** | 832 | 25 | 3 |
| **School 10** | 253 | 9 | 3.2 |
| **School 11** | 108 | 1 | 0.92 |
| **Total 11 schools** | 7301 | 172 | 2.3 |

***Table 3. Hernia and retractile testes associated with undescended testes.***

| Finding | No. | % |
|---|---|---|
| Hernias in the side of undescended testis | 6 | 3.49 |
| Hernias in the sound side | 2 | 1.16 |
| Retractile testes in the sound side | 3 | 1.74 |

## DISCUSSION

Undescended testes are found in 3% of full term male infants and 33% in the premature babies at birth.[4[ It is the most common birth defect in boys affecting 4-9% of new borns and 1-2% of boys 1 year of age.[5] The study which was done during the World War 2 showed the prevalence of undescended testes was 0.28%, positive family history was found in only 10%. [17] Similar study was done in local area in Nigeria gave an incidence of 2.5%, 42.5% were left sided, 45% right sided and 12.5% bilateral[18] (almost similar to figures obtained in our study). Recent studies in UK and other European countries suggest that the prevalence of congenital cryptorchidism continues to increase.[19] Prospective clinical studies have shown that the prevalence of cryptorchidism among boys with birth weight less than 2500 grams has increased in UK from 2.7 to 4.1% between 1950s and 1980s, and in Denmark from 1.8 to 8.4% between the 1950 s and 1990s. [20] The increase in the incidence may be related to genetic background specially in a closed society, this need to be investigated. In the United States, the prevalence of undescended testes ranges from 3.7% at birth to 1.1% from age 1 year to adulthood. International incidence ranges from 4.3-4.9% at birth to 1-1.5% at age 3 months to 0.8-2.5% at age 9 months this decline in the incidence is explained by that significant number of cases were retractile testes rather than true cryptorchidism.[21-24] Cryptorchidism was identified in 1.5-4% of fathers and 6.2% of brothers of patients with these anomalies.[3] Data suggesting increasing prevalence are conflicting, possibly related to problems with diagnostic accuracy and significant number of cases being retractile and not true chryptorchoids.[22,25] In our study the prevalence is 2.3% in school pupils of age group between 6-15 years (relatively elevated), higher on the left and the left to right ratio was1/0.4, a marked departure from study carried out by Taha in 1995 which gave left to right ratio of 1/0.89.[26] The bilateralism in our screening was 12.2% a different finding from Colodng, in 1986 who gave a figure of 22.5%.[27] Descent of testes into the scrotum occurs by a complex multifactorial process involving the normal development of the testis, the hormonal action of insulin like growth factor 3, testosterone, an intact hypothalamic pituitary testicular axis, the patent processus vaginalis, gubernacular out growth and regression of intra abdominal pressure. [28] Testicular descent occurs in two phases, during the first phase and before midge station the testis remains anchored to the inguinal area by insulin like hormone 3(INSL3) driven development of the gubernaculum. The second phase inguinoscrotal phase is dependent on testicular androgen and it is usually completed by the time of birth. [20] In most patients with unilateral undescended testes the testis can be felt in the inguinal canal or in the upper scrotum, some time it is difficult to palpate or even not palpable indicating either abnormality or agenesis of the gonads, for this reason MRI, laparoscopy and laparotomy are indicated to localize the missing testes.[29,30] In our study the majority of undescended testes were impalpable. When the testes are undescended in both sides the study of serum gonadotrophin is useful because serum luteinizing hormone is elevated when gonad tissue is missing and the patient usually infertile.[31] The effects of undescended testes are depression of spermatogenesis, vulnerability to trauma, torsion, malignant degeneration and psychological upset.[32] The depressed

spermatogenesis affects not only the undescended testes but also the normally descended, and this will appear after age of two years, [33,34] for this reason it is now accepted the surgical repositioning of the undescended testes by age of two years.[35,36] The liability of the undescended testes for malignant changes is not fully understood, however, inherited abnormalities in the chryptorchoid is claimed. The longer the testis remains undescended and the higher the testes from the bottom of scrotum the more severe the histological changes.[37] In one side undescended testis the risk of testicular cancer may be increased in both testes, although to a much greater extent on the epsilateral side. [38] Cryptorchidism represents a risk feature for primitive testiculopathy associated with long term complications (infertility, torsion, neoplasia and hormonal changes)[10,24,39,40] Children with bilateral cryptorchidism without treatment in early age are certainly set to become infertile and the rate of infertility is inversely proportional to the age.[39] Hormonal therapy is the best initial treatment in most cases, if this is unsuccessful surgery should be performed without delay before the child first birthday to minimize the risk of impaired fertility.[24]

*In conclusion*, figures obtained from our study compare with the other studies in fostering the hypotheses of gradual increase in the incidence of the undescended testes during the last decades. The prevalence of the undescended testes is variable especially in a closed and related society like that of our study.

## REFERENCES


1. **Dorland WAN. Dorlands illustrated medical dictionary 29th ed, W.B sanders. 2000; 423, 1817.**
2. **Hall-Craggs ECB. Descent and abnormalities of testis, In: Urban & Schwarzenberg Anatomy as bases for clinical medicine. 2nd, 1990; 237-238.**
3. **Sumfest JM, Colon TF, Rukstalis DB. Cryptorchidisim. http://emedicine. Medscape.com article 438378-overview. 2009.**
4. **Mouriquand P. Undescended testes in children. The pediatric urologist point of view. Eur J Endocrinol. 2008; 15: 27-29.**
5. **Schnack TH, Zdravkovic S, Myrup C, Westergaad T, Wohlfahrt J, Melbye M. Familial aggregation of cryptorchidism, A nationwide cohort study. Am J Epidemiol 2008; 23: 46-48.**
6. **Chacko JK, Barthoid JS. Genetic and environmental contributors to cryptorchidism. Pediatr Endocrinol Rev 2009; 6(4): 476-480.**
7. **Barthoid JS. Undescended testis: current theories of etiology. Curr Opin Urol 2008; 18(4): 395-400.**
8. **Damgaard IN, Jensen TK, Petersen JH, Skakkebaek NE, Toppari J, Main KM. Risk factors for congenital cryptorchidism in a prospective birth cohort study. PLOS ONE 2008; 3(8): e 3051.**
9. **Main KM, Skakkebaek NE, Toppari J. Cryptorchidisim as part of testicular dysgenesis syndrome: The environmental connection. Endocr Dev 2009; 167-173.**
10. **Kojima Y, Mizuno K, Khori K, Hayashi Y. Advance in molecular genetics of cryptorchidism. Urology 2009; 7: 234-8.**
11. **Brucker-Davis F, Wagner-Mahler K, Delattre I, Ducot B, Ferrari P, Bongain A, et al. Cryptorchidism at birth in Nice area (France) is associated with higher prenatal exposure to PCBs and DDE, as assessed by colostrums concentration. Hum Reprod 2008; 24: 17-19.**
12. **Foresta C, Zuccarello D, Garolla A, Ferlin A. Role of hormones, genes and environment in human cryptorchidism. Endocr Rev 2008; 24: 53-55.**
13. **Giordano F, Carbone P, Nori F, Mantovani A, Taruscio D, Figa-Thalamanca I. Maternal diet and the risk of hypospadias and cryptorchidism in the offspring. Paediatr Perinat Epidemiol 2008; 22(3): 249-260.**
14. **Bonney T, Huston J, Sowthwell B, Newgreen D. Update on congenital versus acquired Undescended testes, incidence, diagnosis and management. ANZ J Surg 2008; 78(11): 1010-1013.**
15. **Ismail K, Ashour M, El-Afifi M, Hashish A, El-dosouky N, Nagm M, et al. Laparoscopy in the management of impalpable testis: Series of 64 cases. World J Surg 2009; 12: 62-65.**
16. **Kravarusic D, Freud E.The impact of laparoscopy in the management of non-palpable testes. Paediatr Endocrinol Rev 2009; 7(1): 44-47.**
17. **Adoti ML, Fadiora SO, Oguntola SA, Aderounmu AO, Loasebilcan DA, Adgumobi OO. Cryptorchidism in local population in Nigeria. West Afr J Med. 2004; 23(1), 62-64.**
18. **Ritzen EM, Kollin C. Management of undescended testes: how and when?. Pediatr Endocrinol Rev 2009; 7(1): 32-36.**
19. **Acereni CL, Miles HL, Danger DB, Ong KK, Hughes IA. The descriptive epidemiology of congenital and acquired cryptorchidism in a UK infant cohort. Arch Dis Child 2009; 94(11); 868-872.**

20. Vertanen HE, Toppari J. Epidemiology and pathogenesis of cryptorchidism. Hum Reprod Update 2007; 21.
21. Hughes I, Acereni C. Factors controlling testes descent. Eur J Endocrinol 2008; 22: 38-40.
22. Inan M, Aydiner CY, Tokuc B, Aksu B, Ayhan S, Ayvas S, et al. Prevalence of cryptorchidism, retractile testis and orchiopexy in school children. Uro Int 2008; 80(2): 166-167.
23. Chilvers C, Pike MC, Forman D, Fogelman K, Wadsworth ME. Apparent doubling of frequency of undescended testis in England and Wales in 1962-1981. Lancet 1984; 11, 2(8298): 320-322.
24. Mothers MJ, Sperling H, Robben H, Roth S. The undescended testis, diagnosis, treatment and long-term consequences. Dtsch Arztebi Int 2009; 106(33): 527-532.
25. Guven A, Kogan BA. Undescended testis in older boys, further evidence that ascending testes are common. J Pediatr Surg 2008; 43(90: 1700-1704.
26. Taha SA. The place of orchiopexy in post pubertal patients. Saudi Med.J.1995; 16(2): 146.
27. Colodny AH. Undescended testes. Is surgery necessary? N.Engl. Med. 1986; 314: 510-511.
28. Husmann DA. Testicular descent, a hypothesis and review of current controversies. Pediatr Endocrinol Rev 2009; 6(4): 491-495.
29. Taha SA. The value of laparoscopy in the localization of impalpable testis. Saudi Med.J. 1994; 15(5): 456.
30. Galvin DJ, Bredin H. The role of laparoscopy in the management of the impalpable testicle. Ir.J.Med.Sci. 2002; 171(2); 73-75.
31. Lim HN, Huges IA, Hawkins JR. Clinical and molecular evidence for role of androgen and WTI in the testes descent. Mol-Cell-Endocrinol. 2001; 185(1-2): 43-50.
32. Pamenter B, Debono JS, Brown IL, Nandini A, Mikaya SB, Russell J, et al. Bilateral testes cancer, a preventable problem. BJU. Int.2003; 92(1):43-46.
33. Rusnack SL, Wu HY, Huff DS, Snyder HM 3ed, Carr MC, Bella RD, et al. Testis histopathology in boys with cryptorchidism correlates with future fertility potential. J. Urol 2003; 169(2): 659-662.
34. Mengel A. Study on cryptorchidism "A comparison of histological finding before and after second year of life".J.Pediatr Surg. 1974; 9: 445.
35. Picke MC, Chilver C, Pekman MJ. Effect of age at orchiopexy on risk of testicular cancre. Lancet 1986; 1:1248.
36. Ragendaran R, Sathyanji EK, Pai R. Age of treatment of undescended testes. J. Indian.Med. Assc. 2002; 100(11): 662-670.
37. Hack WW, Mejer RW, Van-Der-Voort,Doedens L MI, Bos SD, Haasnoot T. Natural course of acquired undescended testes in boys. Br J Surg. 2003; 90(6): 728-731.
38. Akri O, Pettersson A, Richiardi L. Risk of contralateral testicular cancer among men with unilateral undescended testis: a meta analysis. Int J Cancer 2008; 30:61-64.
39. Lavignera S, Calogero AE, Condorelli R, Marziani A, Cannizzaro MA, Lanzafame F, et al. Cryptorchidism and its long-term complications. Eur Rev Med Pharmacol Sci 2009; 13(5): 351-356.
40. Garcia Palacios M, Somoza I, Lema A, Molina ME, Gomez Veiras J, Tellado M, et al. Non palpable testes,laproscopic or inguinal approach?. Cir Paediatr 2009; 22(2): 69-71.