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**Prevalence and Determinants of Late Presentation and
Management of Undescended Testis in Iraq**

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Abstract

Background: Undescended testis is the most common endocrine disorder in male children. Delayed diagnosis and treatment of undescended testis lead to complications such as infertility, malignancy and testis rotation.

Objective: To evaluate the prevalence and possible causes of delay proper treatment of patients with undescended testis in our population.

Materials and Methods: Clinical records of patients managed for undescended testis from March 2018 to March 2020 were reviewed in six hospitals Iraq (Three Public and three Private hospital). Late presentation was defined as those cases that presented to us for the first time after the 1st year of life. Delayed treatment refers to those that accessed surgical correction after the 1st year of life even though they presented before the 1st year of life. All children with undescended testes who were treated over the period, whose parents / caretaker oral consent and whose data were complete were included in the study.

Results: There were 165 patients with 183 undescended testes. Mean age of patients was 2.3 ± 0.92 years; 61.8% of them were 1st noticed before one year of age; and 59.4% of them were presented to urologist or pediatric surgeon for management after one year of age (Late). Mother was the most common person who noticed the empty scrotum (60%). The most common reason for late presentation was Unawareness that the testes were undescended until prior to presentation (23%). Prevalence of late presentation and management was seen significantly among patients who lived in rural area, whose mothers had low educational level, who delivered by vaginal delivery, and who delivered in general hospitals or at home.

Conclusion: Late diagnosis of undescended testis by physician and lack of awareness of parents are the main reasons in delayed diagnosis and treatment of these common disorder. Therefore, education of parents and careful physical examination of the male newborn at birth and regular follow-up until 18 months can prevent the delay in diagnosis.

Keywords: Undescended testis, cryptorchidism, Delayed presentation, orchidopexy.

Introduction

Undescended testis (UDT) is the absence of at least one testicle from the scrotum ⁽¹⁾. It is the single most common genitourinary disease in male neonates ⁽²⁾. It has been reported that 1 - 4.6% of full-term infants have UDT. The incidence is even higher in premature and low birth weight infants with reports up to 45% ⁽³⁾. In infants born with undescended testes, the testes may descend into the scrotum in 75% of full-term neonates and in 90% of premature newborn boys in infancy, and the incidence decreases to 0.8-1.2% at 1 year of age ⁽⁴⁾. Beyond one year of age, the incidence of azoospermia in un-treated UDT ranges between 13% and 89% in unilateral and bilateral cases, respectively ⁽⁵⁾. Retraction of the testis into the upper scrotum (or even higher) is a normal phenomenon for regulating the temperature of the testis in children and is also a protective reflex. The cremasteric reflex which causes retraction can be invoked by cold temperature, anxiety, nervousness, or local stimulation ⁽⁶⁾. Several risks factors are known to play a role in UDT. It is more common in prematurity, as 15-30% of premature males have UDT in the first few months after birth. Family history has been associated with a higher risk, with certain genetic mutations likely contributing ⁽⁷⁾. Other factors that may be associated with UDT include low birth weight for gestational age, as well as maternal smoking, analgesic use and estrogen exposure during pregnancy ⁽⁸⁾. Early detection and treatment of UDT by orchiopexy between 6 and 12 months of age is thus important to minimize this germ cell loss and improve the individual's fertility index, especially in those whose gonocytes has transformed into the Ad (dark) spermatogonia ⁽⁵⁾. Patients with UDT should be treated because of increased risk of infertility, testicular cancer, torsion and/or accompanying inguinal hernia (>90%), as well as because of cosmetic concerns ⁽⁹⁾. Therefore, any UDT after the age of 6 months should be referred for orchiopexy ⁽¹⁰⁾. Current guidelines recommend that orchidopexy for UDT should be undertaken before 2 years of age because of the possible risks of torsion, infertility, and malignant transformation ⁽¹¹⁾. However, despite convincing evidence and consistent guidelines, a considerable number of orchidopexies continue to be performed beyond 2 year of age. The prevalence of such delays, and the factors that lead to the delays, are not well understood ⁽¹²⁾. The aim of this study was to evaluate the prevalence and possible causes of delay proper treatment of patients with UTD.

Patients and Methods

Study design, setting, and time: This was a cross sectional study conducted in six hospitals (Three Public and three Private hospital) in Iraq during a period of two years from (March 2018 to March 2020).

Study Population and sample size: The study included all patients who managed for UDT. They were reviewed from the clinical records of the selected hospitals. Those with missing information in the case files were contacted by telephone interviews and/or invitation for a clinical examination and completing the missing data. Late presentation was defined as those cases that presented to us for the first time after the 1st year of life. Delayed treatment refers to those that accessed surgical correction after the 1st year of life even though they presented before the 1st year of life. Informed consent was given to all parents / caregivers before being enrolled into the study. Assent from older patients was also obtained. All children with UDT who were treated and whose parents/caretaker agreed oral consent and whose data were complete were included in the study. Those who refused to participate in the study were excluded.

The total number of study patients was 165 patients with 183 UDT.

Data collection: The data was collected from archive files including socio-demographic characteristics, previous medical, surgical and drug history, date of first presentation, side of UDT, type and site of delivery, who noticed the empty scrotum, and reasons for late presentation to the Pediatric Surgical consultation.

Statistical analysis: The data analyzed using Statistical Package for Social Sciences (SPSS) version 26. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Chi square test was used to assess the association between late presentation and management with certain information, while fisher exact test was used instead when the expected frequency was less than 5. A level of P – value less than 0.05 was considered significant.

Results

In this study, mean age of patients was 2.3 ± 0.92 years; 58.2% of them were living in urban area; 13.3% had positive family history of UDT; 40% of their fathers were finished secondary school; 36.4% of their mothers were finished higher education; 60.6% of them were delivered by cesarean section; 68.5% were delivered in general hospitals; 55.2% of patients had left side UDT; 61.8% of them were 1st noticed

before one year of age; and 59.4% of them were presented to urologist or pediatric surgeon for management after one year of age (Late) as shown in table (1).

Table 1: Distribution of study patients by certain characteristics

Variable	No. (n= 165)	Percentage (%)
Age (Year)		
< 1	67	40.6
1 – 5	52	31.5
> 5 - 12	36	21.8
> 12	10	6.1
Residence		
Urban	96	58.2
Rural	69	41.8
Family history of UDT		
Yes	22	13.3
No	143	86.7
Father Education		
Illiterate	12	7.3
Primary school	32	19.4
Secondary school	66	40.0
Higher education	55	33.3
Mother Education		
Illiterate	18	10.9
Primary school	41	24.8
Secondary school	46	27.9
Higher education	60	36.4
Mode of delivery		
Vaginal	65	39.4
Cesarean section	100	60.6
Site of delivery		
General hospital	113	68.5
Private hospital	33	20.0
Home delivery (Midwife)	19	11.5
Side of UDT		
Left	91	55.2
Right	56	33.9
Bilateral	18	10.9
Detection of UDT		
First noticed < 1 year of age	102	61.8
First noticed 1 - 5 years of age	43	26.1
First noticed > 5 years of age	20	12.1
Presentation to urologist or pediatric surgeon and management		
Before 1 year of age	67	40.6
After 1 year of age (Late)	98	59.4

As shown in table (2), mother was the most common person who noticed the empty scrotum (60%), then the doctors (26.7%).

Table 2: Distribution of study patients by the person who noticed the empty scrotum

Who noticed the empty scrotum ?	No. (n= 165)	Percentage (%)
Mother	99	60.0
Doctor	44	26.7
Patient	6	3.6
Grandmother	5	3.0
Father	4	2.4
Delivery nurse	4	2.4
Brother	3	1.8

The most common reason for late presentation was Unawareness that the testes were undescended until prior to presentation (23%); then delayed referral (17.6%) as shown in table (3).

Table 3: Reasons for late presentation

Reason	No. (n= 165)	Percentage (%)
Unaware that the testes were undescended until prior to presentation	38	23.0
Delayed referral	29	17.6
Presented to a hospital earlier but was told to wait for descent without time limit	12	7.3
Non-compliance to advised follow up schedules	5	3.0
Financial constraints	2	1.2
Late ascent of a testis previously sited in the scrotum	9	5.5
Believes that the testis will still descend	3	1.8

We noticed that the highest prevalence of late presentation and management was seen significantly among patients who lived in rural area ($P= 0.001$), whose mothers had low educational level ($P= 0.01$), who delivered by vaginal delivery ($P= 0.016$), and who delivered in general hospitals or at home ($P= 0.001$).

No significant associations ($P \geq 0.05$) between prevalence of late presentation and management with family history of UDT or father education.

Table 4: Association between late presentation and management with certain details

Variable	Presentation and management		Total (%) n= 165	P - value
	Late (%) n= 98	Early (%) n= 67		
Residence				
Urban	47 (49.0)	49 (51.0)	96 (58.2)	0.001
Rural	51 (73.9)	18 (26.1)	69 (41.8)	
Family history of UDT				
Yes	10 (45.5)	12 (54.5)	22 (13.3)	0.152
No	88 (61.5)	55 (38.5)	143 (86.7)	
Father education				
Illiterate	8 (66.7)	4 (33.3)	12 (7.3)	0.657
Primary school	20 (62.5)	12 (37.5)	32 (19.4)	
Secondary school	41 (62.1)	25 (37.9)	66 (40.0)	
Higher education	29 (52.7)	26 (47.3)	55 (33.3)	
Mother education				
Illiterate	13 (72.2)	5 (27.8)	18 (10.9)	0.01
Primary school	32 (78.0)	9 (22.0)	41 (24.8)	
Secondary school	24 (52.2)	22 (47.8)	46 (27.9)	
Higher education	29 (48.3)	31 (51.7)	60 (36.4)	
Mode of delivery				
Vaginal	46 (70.8)	19 (29.2)	65 (39.4)	0.016
Cesarean section	52 (52.0)	48 (48.0)	100 (60.6)	
Site of delivery				
General hospital	78 (69.0)	35 (31.0)	113 (68.5)	0.001
Private hospital	7 (21.2)	26 (78.8)	33 (20.0)	
Home delivery (Midwife)	13 (68.4)	6 (31.6)	19 (11.5)	

Discussion

UDT is one of the most common congenital disorders and a common childhood problem worldwide ⁽³⁾. The initiative for early orchidopexy is due to increasing knowledge of the progressive histological changes to the cryptorchid testis from infancy (reduction in number of Leydig cells, reduction in number and development of germ cells, risk of future tumor formation) which was found to be more prominent after the age of 12 months in the UDT. The increased risk of testicular germ cell tumors associated with undescended testes has been demonstrated in the literature ⁽¹³⁾.

The ideal timing for the correction of undescended testes has been a controversial topic but most studies currently agree that undescended testes should be corrected between 6 and 18 months of age. This is because after 6 months the testes are increasingly unlikely to have a spontaneous descent ⁽¹⁴⁾. While concerns about the age at orchiopexy have been raised several times in the past, delayed orchiopexy is still a universal problem. Many centers from all over the world and abundantly of studies performed about late diagnosis of cryptorchidism are still reporting the mean age of orchidopexy beyond the recommended age ^(15, 16). Data from our study showed that 113 boys (68.5%) born at hospital (most of them vagina delivery at public hospital. Many of these hospitals where children were delivered are not thoroughly examined and followed up, due to shortage of trained medical personnel and they are usually manned by one or two medical doctors, very few trained nurses and many nurse assistants. Ideally, the newly born should be examined after birth; in detail within the first 48 hours of birth, and at 6 weeks' post-partum ⁽⁵⁾. This non adherence to new born examination guidelines leading to delayed presentation of undescended testes was also supported by two other findings from the study. Firstly, only 40 boys (24.2%) initially discovered with absence of the testis in the scrotum by the medical personnel either the doctor or the nurse. Secondly, almost of the patient's caregivers reported to our hospital on self-referral mostly by the mother in 99 (60%) cases. Again, therefore proper education of the medical personnel on management protocols is very important.

Only 40 patients (24.2%), UDT was first noticed at birth, Majority of cases (98 boys, 59.4%) had surgical treatment after one year of age, only 67 (40.6%) had surgical treatment within one year of age. The results of our study confirm conclusions of previous studies which indicated that missed diagnosis at birth and delay in referring for treatment by physicians appear to be major factors responsible for delay diagnosis and treatment ⁽¹⁰⁾. Several studies showed that failure of medical screening is most common reason for late diagnosis of cryptorchidism. Also, they recommended that physicians and other health workers undertaking surveillance procedures should be adequately trained in the technique of examining testes of young babies and children and aware to refer boys over 6 months with UDT to surgeons ^(17, 18). Physicians are the main responsible for the late presentation of the patients and indicated that careful physical examination and screening at birth by pediatrician and other practicing physicians is necessity. In this regard, they recommended an intensive education of both the public and medical profession ⁽⁵⁾.

Other possible reasons for delay were parent's unawareness or misinformation of surgery necessity and UDT complications and parental ignorance. On the other hands, parent's inexperience is one of the important reasons for delay in treatment. In conclusion, the etiology of this condition is a missed diagnosis at a younger age. The testis is undescended but almost completely descended. With somatic growth the distance between the terminal portion of the gubernaculum of the apparently descended testis and the scrotum increases, making the diagnosis more obvious. The potential for this condition makes it mandatory that intrascrotal testicular location be confirmed by periodic physical examination through puberty.

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