



## ORIGINAL ARTICLE

# Undescended testis: Knowledge and Practice Among Primary Care Physicians in Bahrain

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### Abstract

**Background & Objectives:** Un-descended testis (UDT) is the most common congenital anomaly in male newborns. Spontaneous descent of testes does not occur beyond six months of age. As Bahrain has a universal child screening program, primary care physicians are the first physicians to encounter these children. This study aimed to investigate the knowledge of UDT, its work up and management among primary care physicians in Bahrain. Awareness of recent guidelines and current recommended practices in management were evaluated.

**Materials & Methods:** This cross-sectional study was based on a self-administered 12-item questionnaire with questions about incidence, pathophysiology, examination, management and complications of undescended testes, which was distributed among 101 primary care physicians. Data was expressed as mean ± standard deviation and measures of central tendency were used for descriptive analysis. P value was set at <0.05.

**Results:** An equal number of family physicians and pediatricians completed the survey, while general practitioners formed the lowest proportion of responders. Most of the responders had at least 5 years of experience (72.3%) and encountered an average of one to four cases of UDT per year (70.3%). With respect to the knowledge of UDT and specialty ( $p > 0.05$ ), work experience ( $p > 0.05$ ) or annual case load ( $p > 0.05$ ) was observed. The average score in this cohort was 5.9 out of a maximum of 10 points. About 50.5% of the respondents scored between 5 and 6 points (50.5%).

**Conclusions:** A remarkable gap in the knowledge about the different aspects of UDT amongst primary care physicians was documented.

**Keywords:** Bahrain; Cryptorchidism; Male; Newborn infant; Primary care Physicians; Surveys and Questionnaires

## Introduction

Cryptorchidism or un-descended testis (UDT) is the most common congenital abnormality in male babies. It occurs in up to 4.5% and 45% of full term and preterm male infants, respectively.<sup>1,2</sup> Risk factors for UDT include prematurity, low birth weight, family history of un-descended testis and sometimes underlying congenital anomalies.<sup>3</sup> Normally, the spontaneous descent of the testis is expected to occur at around four to six months of age due to a surge in gonadotropins and androgens. After that, it is less likely that the testis will descend spontaneously down to the scrotum.<sup>2,4,5</sup> Therefore, prompt diagnosis and management of UDT is of paramount importance. Potential serious complications of untreated un-descended testis include torsion of testis, associated hernias, infertility and testicular malignancies.<sup>2,4,5</sup>

UDT is a congenital condition that has serious long-term consequences that affect a patient's quality of life. It is mainly diagnosed by primary care physicians who perform regular child screening checkups and make the appropriate referrals accordingly. Appropriate and timely referrals for further management of UDT depends heavily on general practitioners (GP) and community pediatricians and the slightest misinformation or lack of awareness regarding this common condition may lead to unnecessary avoidable delays in management, and hence, a poor prognosis. The latest guidelines advocate screening for un-descended testis within three days of birth, at 6-8 weeks of age and 4-5 months of age. Given that there is no spontaneous descent of testis at the age of six months, primary physicians should refer the patient to an appropriate surgical specialist for further evaluation.<sup>2,6,7</sup>

An un-descended testis is managed surgically by open or laparoscopic orchidopexy depending on palpability. The surgical success rates are high and both recurrence and complication rates are low. In fact, as per the American Urological Association (AUA) and European Association of Urology (EAU) guidelines, surgery within the first 18 months of life is recommended to preserve fertility.<sup>2,5,8</sup> In this study, the authors aimed to assess knowledge about the incidence, screening, diagnosis, and management of un-descended testis among primary

care physicians in Bahrain.

## Materials and Methods

This cross-sectional study was carried out between June 2019 and February 2020. Data was collected via an anonymous self-administered questionnaire. The questionnaire was tested for clarity of questions on 10 individuals before adopting the questionnaire on the selected sample. It was then offered to 101 physicians with regular inflow of pediatric patients in their practice setting. Primary care physicians refer to all doctors who first encounter cases of suspected un-descended testis prior to referral. Primary care physicians include (General practitioners, Family physicians, Paediatricians).

The selected sample included doctors from one public hospital, four local health centres and four private hospitals. Freshly graduated doctors with less than one year experience were excluded.

Survey was distributed and collected either in person or through online survey administration software (google forms). The questionnaire was limited to topics related to the diagnosis of UDT and urgency of referral in the form of close-ended questions with multiple choice answers. Time for completion of the survey was estimated to be 04:28 minutes. Data obtained included specialty, level of experience and case load.

**Table 1: Respondents according to Specialty, level of experience and the annual load of UDT cases.**

Variable	N (out of 101)	%	
<b>Specialty</b>	Family physicians	49	48%
	Pediatricians	47	47%
	General practitioners	4	4%
	Not specified	1	1%
<b>Experience</b>	<5 years	28	27.7%
	5-10 years	18	17.8%
	>10 years	55	54.5%
<b>Annual case load</b>	No cases	24	23.8%
	1-4 cases	71	70.3%
	5-9 cases	1	1%
	10 or more cases	5	5%

Furthermore, the survey covered the following aspects of UDT:

1. Incidence of UDT
2. Time of spontaneous descent of testis
3. Most important diagnostic tool
4. Findings on physical examination
5. The need for ultrasound in the diagnosis of UDT
6. Time of referral to pediatric surgery
7. Time of surgery
8. Consequences of untreated UDT

Data was expressed as mean±standard deviation where applicable. Statistical significance was set at P value <0.05. Measures of central tendency such as mean, mode and median were used for descriptive analysis. For statistical analysis of non-parametric data, one-way ANOVA test and Kruskal-Wallis test were used. All statistical analyses was carried out using statistical package for social science (SPSS) V23.

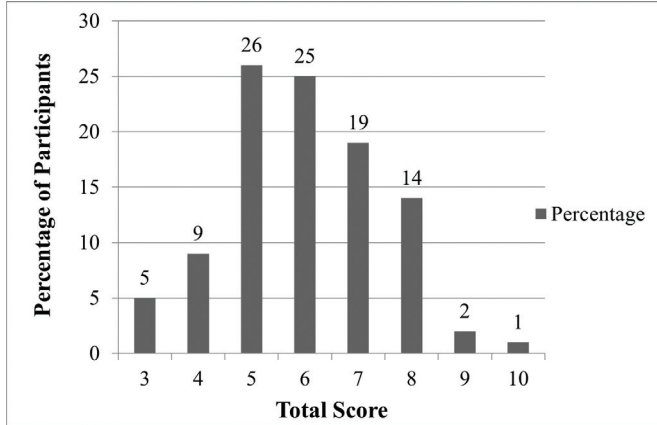
## Results

Of the 101 physicians who responded to the questionnaire, nearly half of them were either family physicians (48%) or pediatricians (47%). Most of the respondents were physicians with 5 to 10 years or more than 10 years (17.8% and 54.5% respectively) with the majority seeing around one to four cases of un-descended testis annually in their practice (70.3%). [Table 1]

The average score was 5.98±1.47 (range 2-9), with around half of the respondents scoring between 5 and 6 out of the maximum of 10(50.5%)[Figure 1]. The percentage of correct responses to each question is shown in Table 2. There was no statistically significant difference between a physician's specialty and the level of knowledge about UDT ( $p >0.05$ ). A similar non-statistically significant result was found when comparing the level of a knowledge about UDT with the annual case load of undescended testis ( $p >0.05$ ). Difference in scores were found between physicians with more than 10 years of experience when compared with those who have 5-10 years of experience ( $p <0.05$ ). However, when comparing all three subgroups together, there was no significant difference in the level of knowledge between them ( $p >0.05$ ).

**Table 2: Questionnaire results.**

Question	Acceptable answer	Correct, N (%)
The most common birth defect of male genital tract is	UDT	81 (80.2)
Undescended testis is present in	3% & 30%	50 (49.5)
Spontaneous descend of undescended testicles to normal scrotal position "mostly" occur within	First 6 months of life	52 (51.5)
Spontaneous descent of testis "does not occur" after age of	6 months	6 (5.9)
The most important tool in diagnosis & decision making of a palpable undescended testis is	Physical Exam	60 (59.4)
Physical examination of a palpable undescended testes should include	All of the Above (Testis position & size, tension on cord, scrotal asymmetry)	97 (96%)
In cases of palpable undescended testis, an ultrasound study is	Might be required in selected cases	39 (38.6)
Infants with undescended testis should be referred to pediatric surgeon	After diagnosis	48 (47.5)
Surgery to place the testicle at a normal anatomic position aims to	All of the above (preserve fertility, diagnose testicular malignancies, correct associated hernias, prevent testicular torsion)	95 (94.1)
Surgery for a palpable undescended testis is recommended	6-12 months	48 (47.5)



**Figure 1: Overall score of the ten-question survey**

## Discussion

Undescended testis (UDT) is the most common congenital defect in male infants and has a higher propensity in the premature cohort.<sup>1,2</sup> According to the recent literature, incidence rates of UDT amongst term and pre-term male babies is between 1-4.6% and 1.1-45%, respectively.<sup>4,5</sup> Moreover, Berkowitz et al. states that around 1% of all full-term male infants are still affected by UDT at the age of one year.<sup>9</sup> During routine child screening, the first physicians to encounter UDT are primary healthcare providers such as general practitioners, family physicians and pediatricians. Timely diagnosis and referral are of utmost importance as it ensures proper examination by an experienced pediatric surgeon. Consequently, a primary healthcare provider's good knowledge of UDT as a clinical entity and awareness of the latest management guidelines is crucial in determining the outcome for an infant with UDT. Regarding knowledge and awareness of UDT as a congenital disorder, around half of the responders (49.5%) were aware of UDT in male babies but only 5.9% were knowledgeable about the timing of normal testicular descent into the scrotum. Furthermore, a slightly similar cohort of physicians (51.5%) were also knowledgeable about the timing of normal testicular descent into the scrotum. Testicular descent usually happens within the first six months of life, and nearly 1% of full-term male infants still have UDT at the age of one year.<sup>1,5</sup>

As mentioned, primary care physicians are the first to encounter these cases. Therefore, a thorough and clinically focused assessment is of paramount importance. Physical examination is the mainstay

of diagnosis of UDT. More than 50% of responders considered physical examination as the main diagnostic tool. A good physical examination may be enough to diagnose this condition, especially since some cases can be misdiagnosed as retractile or ectopic testis.<sup>2</sup> In this study, the majority of the study participants (96%) recognized all the aspects of examination of testis. Imaging modalities can also be used to aid in the diagnosis of UDT, such as ultrasound and magnetic resonance imaging (MRI) scans. An ultrasound scan was found as a necessity by 36.6% of the responders, while 38.9% found that it may be of use in selected cases. Although it may appear to be a harmless investigation, it can delay access to timely corrective surgery and can mislead referring physicians. As per literature, imaging is not helpful prior to referral as ultrasound has only 45% sensitivity and 78% specificity for locating an impalpable testis.<sup>2,6,7</sup> In an 11-year study conducted in Ontario, Canada, Kanaroglou et al. reported that ultrasound was used in 33.5% and 50% of provincial and institutional referrals for UDT, respectively. Ultrasound was successful in detecting 54% of the cases, however it led to a three-month delay in management.<sup>10</sup> It is worthy to note that imaging may be of use in specific and selected cases, namely disorders of sexual differentiation (DSD).

Timely referral is the keystone in managing undescended testis. As per international guidelines, the likelihood of spontaneous descent decreases after six months of age and it is unlikely after 12 months. Therefore, it is recommended to refer to a specialized surgeon no later than 6 months of age.<sup>2,6,7</sup> In this study, almost 48% of physicians referred at the time of diagnosis. Similar trends were observed in other populations as well. A multicentric study in the United States that included 329 children who underwent orchidopexy for UDT revealed a mean age of 4.5 years at the time of operation. This was attributed to the lack of knowledge and delayed referral amongst primary care physicians.<sup>11</sup> An Austrian study demonstrated delayed time of referral despite clear recommendations for early referral to pediatric surgery. The reason behind this was multifactorial but mainly attributed to the fact that physicians assume that acquired ascending cryptorchidism is the underlying pathophysiology

rather than UDT.<sup>12</sup>A similar survey was conducted in Singapore showing lack of familiarity with UDT.<sup>13</sup>As the study results show that the knowledge of UDT amongst primary care physicians could be improved, infants with either a definitive or suspected diagnosis are to be referred promptly, in order to avoid an untimely diagnosis.

Orchidopexy is the gold standard of treatment of UDT and should be carried out done at 6-12months of age.<sup>2,6,7</sup>It is highly unlikely that testicular descent occurs after the age of six months.<sup>1</sup>Delaying referral and thus time of intervention carries risk of infertility, hernia, testicular torsion, atrophy, and malignancy.<sup>3,4,5</sup>Most of the cohort (94.1%) were knowledgeable about the consequences of delayed management. As per literature, there is confusion amongst primary care providers regarding the implications and outcomes of untreated undescended testis.<sup>14</sup>This confusion results in delays in patients' referral and limiting the potential benefits of early intervention. This was noticeable in the cohort, as there was a discrepancy in knowledge of the pathophysiology, work up, management and prognosis of undescended testis. Another influential factor in the prognosis of these cases is the quality of information provided to the parents. It is very important that physicians holistically and correctly inform a child's parents regarding this condition, especially the importance of timely referral, management and risks associated with delay. The manner in which parents are educated and counselled greatly impacts the outcome. Similar recommendations were made by other studies in the literature.<sup>14</sup>

## Conclusion

A proper understanding and approach to cases of UDT can positively influence the outcomes. Although, work up and management of these cases are generally straight-forward, several cases may be undiagnosed due to minor lapses in work up or referral pattern. Although the primary care physicians in Bahrain are knowledgeable in certain aspects of un-descended testis, they lacked awareness in a few other aspects. On the other hand, questions with multiple choice answers rather than open-ended questions had a high probability of being

correctly answered. Therefore, to minimize the risk of misdiagnosis and the associated complications, the authors recommend cooperation between pediatric surgeons and their primary care physician colleagues. An educational environment consisting of peer-to-peer training, continuous education about the pathophysiology, complications and timely intervention should be encouraged.

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