

# Gaps in Knowledge about the Management of Children with Undescended Testis: A study from Tertiary Care Pediatric Hospital

Shumaila Israr<sup>1</sup>, Jamshed Akhtar<sup>1</sup>, Syed Muhammad Raees Hussain Taqvi<sup>1</sup>,  
Naima Zamir<sup>1</sup>, Safia Bibi<sup>2</sup>

Department of Paediatric Surgery<sup>1</sup>, PHRC Specialized Research Centre for Child Health<sup>2</sup>, National Institute of Child Health, Jinnah Sindh Medical University, Karachi.

## Abstract

**Background:** Children with undescended testis (UDT) are often referred late for surgical treatment that can have a detrimental effect on future prospects of fertility.

**Objective:** To assess the knowledge level of doctors working in pediatric medicine service about the management of undescended testis (UDT).

**Study type, settings & duration:** The Cross sectional study was conducted in National Institute of Child Health, Jinnah Sindh Medical University Karachi, from January 2020 to June 2020.

**Methodology:** A written test was taken about the management of UDT. Scores were calculated for each response and entered into SPSS version 22. Statistical significance of correct responses for each question among graduates, postgraduate residents and consultants was calculated using Chi square test. One way ANOVA and post-hoc analysis was used to compare the mean scores between the groups. A  $p < 0.05$  was considered as significant.

**Results:** A total of 135 doctors participated. Median score obtained was five. Sixty-nine (51.1%) participants knew the importance of neonatal examination for the position of gonads. Seventy-six (56.3%) were aware of physical characteristic of UDT. Ninety-six (71.1%) knew the treatment of UDT is surgery. Thirty-eight (28.1%) participants were aware of the latest recommendation of age at surgery. A significant difference in response was noted among doctors about the physical characteristic of scrotum in UDT ( $p= 0.013$ ), possible pathological outcome ( $p= 0.026$ ) and the mean scores with respect to designation/ experience ( $p= 0.021$ ). Post-hoc analysis revealed significant difference between mean scores of medical graduates and consultants.

**Conclusion:** The knowledge of study participants about the management of children with UDT was sub-optimal.

**Key words:** Undescended testis, orchiopexy, referral pattern, residency program, pediatricians.

## Introduction

Undescended testis is one of the most common congenital urological anomalies in male babies. It is noted in 3-5% of full term newborns and its frequency declines to 1-2% at 3 months of age.<sup>1</sup>

### Corresponding Author:

Shumaila Israr

Department of Paediatric Surgery  
National Institute of Child Health  
Jinnah Sindh Medical University, Karachi.  
Email: [shumaila.pk\\_mbbs@yahoo.com](mailto:shumaila.pk_mbbs@yahoo.com)

**Received:** 02 December 2020, **Accepted:** 01 April 2021,

**Published:** 05 May 2021

### Authors Contribution

SI, JA, SMRHT & NZ conceptualized the project and did the literature search. SI also did the data collection. The statistical analysis was done by SB. The drafting, revision & writing of manuscript was done by SI, JA, SMRHT, NZ MI & SB.

In spite of being a common anomaly its diagnosis, plan of treatment, follow up, impact on male fertility, possibility of torsion, and higher incidence of carcinoma are not known to many healthcare providers.<sup>2</sup> Clinical guidelines based upon the latest evidence in literature are regularly published to update the treating physicians about current recommended practices in context of undescended testis. Current guidelines suggest that all children with undescended testis should be referred before 12 months of age and the recommended age of Orchiopexy is now between 6-12 months.<sup>3</sup> The lack of knowledge may result in delay in diagnosis and treatment with potential consequences.

Studies have been conducted to report the pattern of referral of children with undescended testis from different countries. Snodgrass from United States reported that the median age at which patients with undescended testis were referred was

43.3 months.<sup>4</sup> In a study from Auckland New Zealand the mean age of referral was 42.6 months.<sup>5</sup> In a study comparing the management of patients with undescended testis in a tertiary care centers in England and Nigeria it was found that the diagnosis was delayed and number of patients were referred beyond the recommended time from both the centers. Lack of awareness and knowledge was cited as the main reason.<sup>6</sup> In a population based data from New South Wales Australia, a declining trend was noticed in mean age at referral and timing of surgery but it was still not optimal.<sup>7</sup> The evidence from Pakistan is lacking. This study was conducted to assess the knowledge of doctors working in pediatric medicine services about the clinical features of undescended testis, age of referral, surgery and potential risks if delay in treatment occurs. This may help in improving early referral of children with undescended testis and follow up into adolescence age group.

### Methodology

This was an observational analytic cross sectional study conducted from January 2020 to June 2020. The sample size was calculated using Open Epi software using population size (N) of 200, confidence level 95%, margin of error (d) 5% and considering that 53% of healthcare providers had adequate knowledge based upon a study done earlier,<sup>8</sup> the final sample size obtained was 135. All doctors working in the department of pediatric medicine including interns, residents, medical officers, senior registrar and consultants, were included. Doctors working in other departments of the hospital were excluded. The study was approved by institutional review board.

The survey tool developed by Lim et al in Singapore on awareness of healthcare providers about the management of undescended testis was used in this study.<sup>8</sup> The tool had a combination of multiple choice questions and short response answers on the management of undescended testis. The participants were informed about the objectives

of the study. Informed consent was obtained and confidentiality maintained. The variables assessed were designations/ experience of the participants, scores obtained for each question and overall scores. Each question was assigned one mark and maximum score that could be achieved was eight.

Data were analyzed through SPSS version 22. The response of each question in relation to designation/ experience was stated as frequency and percentages and significance was measured by Chi square. Mean scores of participants with respect to designation/ experience was calculated using one way analysis of variance (ANOVA) to check the significance of difference in mean scores with respect to designation/ experience. Post-hoc analysis using Tukey HSD test was applied to evaluate pair-wise differences in mean scores with respect to designation/ experience. A *p* value of <0.05 was considered significant.

The ethical approval was taken from Institutional Ethical Review Board (IERB) of National Institute Child Health, Karachi.

### Results

Total of 135 doctors working in the pediatric medicine department of the hospital were approached to participate in the study. They were divided into three groups namely graduates (interns- n=17, and medical officers - n=8), postgraduate residents of pediatric medicine (n=94) and consultants (senior registrars- n=7 and faculty members - n=9). There was no refusal by the participants.

Responding to each question, 115 (85.2%) doctors had seen the children with undescended testis. This included all the participants in consultant group and 83 (88.2%) in postgraduate residents group. Sixty-six (48.9%) physicians did not agree to assess the position of gonads in neonatal life. Seventy-six (56.3%) participants were aware of only one physical characteristic - the empty scrotum/ scrotal asymmetry as a sign of undescended testis.

**Table 1: Correct responses of study participants.**

Questions	Acceptable Answer	Correct Response (n %)
The incidence of undescended testis.	3-5% of full term	61 (45.2%)
Age at which to check for position of gonads.	At neonatal age	69 (51.1%)
Physical characteristic of a patient with undescended testis	Empty scrotum / Underdeveloped hemiscrotum or scrotal asymmetry	76(56.3%)
Recommended treatment of UDT.	Surgery	96 (71.1%)
Best timing of referral to a surgeon	At neonatal age	13 (9.6%)
Recommended timing of surgery	6-12 months	38 (28.1%)
Until what age you will continue to examine a patient of UDT	Puberty	32 (23.7%)
Write down at least two possible pathological outcomes of a patient with UDT	Subfertility	86 (63.7%) One character
	Malignancy	16 (11.9%) Two character Nil
	Torsion of the UDT	

**Table 2: Correct responses according to the designation / experience.**

Designation / experience n (%)	What is the incidence of UDT n (%)	Age at which to check for the position of gonads n (%)	Physical characteristic of a patient with UDT n (%)	Recommended treatment n (%)	Best timing of referral n (%)	Recommended timing of surgery n (%)	Until what age you will continue to examine a patient of UDT n (%)	Write down two possible pathological outcomes n (%)
Interns (n=17)	12 (70.5)	8 (47)	6 (35.2)	13 (76.4)	2 (11.7)	5 (29.4)	5 (29.4)	0 (0)
Medical Officers (n=8)	3 (37.5)	4 (50)	2 (25)	4 (50)	0 (0)	1 (12.5)	1 (12.5)	0 (0)
Residents (n=94)	42 (44.6)	46 (48.9)	56 (59.5)	68 (72.3)	7 (7.4)	28 (29.7)	24 (25.5)	13 (13.8)
Senior Registrars (n=7)	0 (0)	4 (57.1)	6 (85.7)	3 (42.8)	3 (42.8)	1 (14.8)	1 (14.2)	3 (42.8)
Consultants (n=9)	4 (44.4)	7 (77.7)	6 (66.6)	8 (88.8)	1 (11.1)	3 (33.3)	1 (11.1)	0 (0)

**Table 3: Statistical analysis of correct responses of the groups of study participants.**

Questions	Group of Participants	Frequency n (%)	p value
Incidence of undescended testis	Graduates	15 (60)	0.082
	Postgraduate Residents	42 (44.6)	
	Consultants	04 (25)	
Age at which to check for position of gonads	Graduates	12 (48)	0.322
	Postgraduate Residents	46 (48.9)	
	Consultants	11 (68.8)	
Physical characteristic of a patient with undescended testis	Graduates	8 (32)	0.013*
	Post Graduate Residents	56 (59.5)	
	Consultants	12 (75.0)	
Recommended treatment of UDT	Graduates	17 (68)	0.891
	Postgraduate Residents	68 (72.3)	
	Consultants	11 (68.8)	
Best timing of referral to a surgeon	Graduates	2 (8.0)	0.085
	Postgraduate Residents	7 (7.4)	
	Consultants	4 (25)	
Recommended timing of surgery	Graduates	6 (24)	0.812
	Postgraduate Residents	28 (29.7)	
	Consultants	4 (25)	
Until what age you will continue to examine a patient of UDT	Graduates	6 (24)	0.485
	Postgraduate Residents	24 (25.5)	
	Consultants	2 (12.5)	
Write down at least two possible pathological outcomes of patient with UDT	Graduates	0 (0)	0.026*
	Postgraduate Residents	13 (13.8)	
	Consultants	3 (18.8)	

\*Significant

Ninety-six (71.1%) doctors knew that operation is required for treating this condition. Only 13 (9.6%) participants were of the opinion that the neonatal age is the best time to refer the infant to the pediatric surgeon. Thirty-eight (28.1%) doctors knew about the recommended age of orchiopexy. Regarding follow up examination of patients with undescended testis, only 32 (23.7%) thought that patient should be examined till the age of puberty. Sixteen (11.9%) participants were familiar with at

least two complications of untreated undescended testis. The overall median score obtained was 5 (range 1-8). The overall scores are given in Table-1 and response to each question by groups of study participants in Table-2.

The significance of correct responses by three groups of participants based upon designation / experience is shown in Table-3. There was a significant difference in responses of interns, residents and consultants when questions were

asked about the physical characteristics ( $p= 0.013$ ) and pathological outcomes ( $p= 0.026$ ). The one way ANOVA suggested that there was a significant difference in the mean scores with respect to designation/ experience ( $p= 0.021$ ). Post-hoc analysis using Tukey HSD test to evaluate pair-wise differences in mean scores revealed significant difference between medical graduates and consultants while scores of postgraduate residents did not differ significantly with that of graduates and consultants (Table-4).

**Table 4: Post-hoc analysis of mean scores of participants with respect to designation and experience.**

Designation/ experience	Score	p value
Graduates	3.82 ± 1.413	
Postgraduate residents	4.51 ± 1.502	0.021*
Consultants	5.09 ± 1.23	

\*Significant

## Discussion

This study revealed lack of knowledge among doctors working in a pediatric set up about a common congenital anomaly. Undescended testis can be diagnosed easily in neonatal period. At birth the scrotum is lax, rugose and hangs loosely. The Cremasteric reflex is documented in 48% of the newborns only.<sup>9</sup> It is therefore easy to document absence of gonads in full term babies. Majority of the UDT descent into scrotum by three months of age thus a regular follow up of such infants is needed.<sup>10</sup> These facts were not known to almost half of the participants in our study. Out of the three study groups, the scores of the consultants was higher than others in response to age at examination for undescended testis while interns scored better in mentioning incidence of this anomaly. This may reflect that with experience clinical approach improves. The response to the question about the physical characteristics of patients with undescended testis was significant as scores of consultant group was higher than others. In a survey from Singapore on a similar subject which included 73 pediatricians in addition to general practitioners and medical students, 12% of pediatricians and 28% general practitioners had never seen patients with undescended testis.<sup>8</sup> The median score of the participants was six. We used the same questionnaire for this study. Twenty (14.8%) participants never saw a child with undescended testis. The median score obtained was five.

In a nationwide study from Germany that sought answer for late referral of patients with undescended and reasons for not following recommended guidelines a survey was conducted to assess the knowledge of the physicians treating children and the medical students about this anomaly.<sup>11</sup> The results showed heterogeneous responses. Overall, the 89% of pediatric surgeons replied correctly that the treatment of undescended testis should be completed within one year of age. The responses of pediatricians (83%) and urologists (84%) were quite similar however only 44% general practitioners were correct in their reply. The results of our study are also comparable with that survey. Doctors working in pediatric set up were not aware of guidelines. In a study from Nigeria it was found that all children were born at different level of hospitals however only 23% had inguinal region examination either at birth or follow up visit at sixth week. Overall in only 25.6% cases the diagnosis was made by the doctors.<sup>2</sup> The importance of neonatal examination is thus highlighted. In our study the group of graduate doctors though routinely involved in the care of children but was found to have unsatisfactory knowledge about management of undescended testis.

There are two other related conditions that must be taken into the consideration during the examination for the position of testis. These include ectopic and retractile testes.<sup>12</sup> Retractable testis is defined as the one that can be brought easily into the base of scrotum where it stays momentarily but then retracts into supra scrotal position due to Cremasteric reflex. The treatment of this condition is usually watchful waiting. Counseling with the parents is of utmost importance to allay their concerns.<sup>13</sup> In a survey from United States on practice variation of primary care providers related to undescended and retractile testis, questions were asked about their knowledge of the subject which included about their exposure to pediatric urology rotation, age at referral of patients and complication associated with this anomaly like infertility and malignancy.<sup>14</sup> Of the total, 20% responded that they will wait till puberty to refer the patients for surgery mostly to the urologist. In nearly 25% - 30% cases counseling was done with parents about potential of malignancy and infertility. In our study the responses of graduate group were almost similar.

Currently Orchiopexy is recommended between 6 - 12 months.<sup>15-17</sup> This shift in approach is based upon the potential harmful effect of high temperature that testes are exposed to at supra scrotal location.<sup>18</sup> In an exhaustive survey to find out ideal age for Orchiopexy specifically in context of future fertility potential and malignancy outcome,

the consensus was on late infancy period.<sup>19</sup> Majority of the study participants in our study knew the type of treatment required for undescended testis. However the response to timing of surgery and age at referral was not appropriate among all the groups.

The harmful effects that can occur if testis remains undescended include torsion which is not uncommon.<sup>20</sup> The salvage rate is reduced if patient is brought late with high orchiectomy rates.<sup>21</sup> This complication is avoidable if timely diagnosis of undescended testis is made and timely referral is done. In our study none of the participants were aware of the possibility of this potential complication in children with undescended testis. This was found statistically significant. The issues of subfertility and malignancy are commonly discussed with the parents before surgery and at follow up which should continue till the age of puberty with pediatric surgeons and in adolescence period with urologists.<sup>22</sup> The risk of these two complications persists even when Orchiopexy is performed at a recommended age. This is due to the damage that occurs to testicular germ cells the extent of which is not known. Subfertility as a potential complication of undescended testis was known to most of the study participants however higher risk malignancy was mentioned about 12% only. The overall comparison showed that the scores of consultants were significantly higher than graduates but comparable with the postgraduate residents group.

The role of doctors in making diagnosis and timely referral of patients with undescended testis is important. Paediatricians in most of the healthcare set ups can play a leading role. They can be trained through different continuous medical education as well clinical skills courses to perform detailed physical examination of an infant to identify different anomalies. A formal clinical rotation in pediatric surgery of postgraduate residents in pediatric medicine may help in consolidating the concepts about common surgical conditions while general practitioners and family physicians may be taught through dedicated sessions about congenital anomalies in children. This may help in making early diagnosis and timely referral of children with the undescended testis. The strength of this study was being carried out in a designated pediatric set up with large number of doctors especially those in pediatric medicine residency program who in future are expected to contribute to child care. However the limitation was that this study was from a single center.

The knowledge of the study participants was suboptimal about a common congenital anomaly in male babies. Current recommendations

by the panel of experts were not known to most of the doctors working in a dedicated pediatric set up.

**Conflict of interest:** None declared.

## References

1. Hutson JM, Vikraman J, Li R, Thorup J. Undescended testis: What paediatricians need to know. *J Paediatr Child Health* 2017; 53(11): 1101-4.
2. Ekwunife OH, Ugwu JO, Onwurah C, Okoli CC, Epindu LK. Undescended testes: Contemporary factors accounting for late presentation. *Afr J Urol* 2018; 24(3): 206-11.
3. Niedzielski JK, Oszukowska E, Słowikowska-Hilczner J. Undescended testis - current trends and guidelines: a review of the literature. *Arch Med Sci* 2016; 12(3): 667-77.
4. Snodgrass W, Bush N, Holzer M, Zhang S. Current referral patterns and means to improve accuracy in diagnosis of undescended testis. *Pediatrics* 2011; 127(2): e382-8.
5. Upadhyay V, Kothari M, Manoharan M. The referral pattern for undescended testes in Auckland. *N Z Med J* 2001; 114(1135): 310-11.
6. Peiris HD, Lakshminarayanan B, Osifo OD, Lakhoo K. Management of undescended testes: a comparative study in England and Africa. *Ann Pediatr Surg* 2014; 10: 115-8.
7. Schneuer FJ, Holland AJ, Pereira G, Jamieson S, Bower C, Nassar N. Age at surgery and outcomes of an undescended testis. *Pediatrics* 2016; 137(2): e20152768.
8. Lim LY, Nah SA, Lakshmi NK, Yap TL, Jacobsen AS, Low Y, et al. Undescended testis: Level of knowledge among potential referring health-care providers. *J Paediatr Child Health* 2015; 51(11): 1109-14.
9. Caesar RE, Kaplan GW. The incidence of the cremasteric reflex in normal boys. *J Urol* 1994; 152(2): 779-80.
10. Ryu DS, Cho WY, Chung JM, Kang D, Lee SD, Park S. Comparison of penile length at 6–24 months between children with unilateral cryptorchidism and a healthy normal cohort. *Investig Clin Urol* 2018; 59(1): 55-60.
11. Boehme P, Geis B, Doerner J, Wirth S, Hensel KO. Shortcomings in the management of undescended testis: guideline intention vs reality and the underlying causes - insights from the biggest German cohort. *BJU Int* 2018; 122(4): 644-53.
12. Ulubay M. Perineal ectopic testis: A rare congenital anomaly. *Urol Case Rep* 2019; 24: 100853.
13. Keys C, Heloury Y. Retractable testes: a review of the current literature. *J Pediatr Urol* 2012; 8(1): 2-6.
14. Shnorhavorian M, Jacobs MA, Stearns G, Mingin G, Koyle MA. Practice variation and clinical confusion regarding undescended testes and retractile testes among primary care respondents: a multi-regional survey study in the United States. *Pediatr Surg Int* 2012; 28(6): 635-9.

15. Tseng C, Chiang I, Hong C, Lu YC, Hong JH, Chang HC. Advantage of early orchiopexy for undescended testis: Analysis of testicular growth percentage ratio in patients with unilateral undescended testicle. *Sci Rep* 2017; **7**: 17476.
  16. Ritzén EM, Bergh A, Bjerknes R, Christiansen P, Cortes D, Haugen SE, et al. Nordic consensus on treatment of undescended testes. *Acta Paediatr* 2007; **96**(5): 638-43.
  17. Hrivatakis G, Astfalk W, Schmidt A, Hartwig A, Kugler T, Heim T, et al. The timing of surgery for undescended testis - a retrospective multicenter analysis. *Dtsch Arztebl Int* 2014; **111**(39): 649-57.
  18. Tseng, C, Huang K, Kuo M, Hong CH, Chen CH, Lu YC. The impact of primary location and age at orchiopexy on testicular atrophy for congenital undescended testis. *Sci Rep* 2019; **9**: 9489.
  19. Chan E, Wayne C, Nasr A. Canadian Association of Pediatric Surgeon Evidence-Based Resource. Ideal timing of orchiopexy: a systematic review. *Pediatr Surg Int* 2014; **30**(1): 87-97.
  20. Naouar S, Braiek S, El Kamel R. Testicular torsion in undescended testis: A persistent challenge. *Asian J Urol* 2017; **4**(2): 111-5.
  21. Zilberman D, Inbar Y, Heyman Z, Shinhar D, Bilik R, Avigad I, et al. Torsion of the cryptorchid testis--can it be salvaged? *J Urol* 2006; **175**(6): 2287-9
  22. Vikraman J, Hutson JM, Li R, Thorup J. The undescended testis: Clinical management and scientific advances. *Semin Pediatr Surg* 2016; **25**(4): 241-8.
-