

## Prevalence of hypospadias patients with undescended testis

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### ABSTRACT

Hypospadias is an anomaly of meatus urethra externus on ventral penis. It caused by incomplete fusion of urethral folds. The purpose of this study was to investigate the prevalence of hypospadias with undescended testis in the Department of Surgery Mohammad Hoesin Hospital in Palembang Indonesia. A prevalence study was done in the Medical Records Department of Mohammad Hoesin Hospital from July 2018 to February of 2019. 103 patients met study inclusion criteria. Univariate analysis of the patients' data was conducted using IBM SPSS Statistics 25. The study found that hypospadias was most common in the age group of 1 to 5 years old (49.5%) and the most common type of hypospadias was severe hypospadias (68.9%). Furthermore, 7 out of 103 patients (6.8%) were hypospadias patients with undescended testis and the most common types of undescended testis among them were bilateral undescended testis and left undescended testis with 3 patients each (42.85%). Prevalence of hypospadias with undescended testis were 7 patients (6.8%).

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## 1. INTRODUCTION

Hypospadias is a genital development anomaly characterized by meatus urethra externus opening on the ventral surface of penis. It is caused by incomplete fusion of urethral folds [1]. Hypospadias is one of the most common congenital anomaly with the occurrence of 0.4 to 8.2 per 1,000 male births [2-3]. Prevalence of hypospadias around the world varies in numbers, from the lowest of 0.6 per 10,000 births in Malaysia and the highest of 464 per 10,000 births in Denmark [4]. Based on Birth Defects Monitoring Program (BDMP), Paulozzi reported that prevalence of hypospadias from 1970 to 1993 increased from 20.2 to 39.2 per 10,000 births. From 2001 to 2010, the prevalence of hypospadias in 23 European countries was 18.61 per 10,000 births [5]. Meanwhile in Indonesia, prevalence of hypospadias is still largely unclear. In Sanglah Hospital in Denpasar Bali, from 53 hypospadias patients treated from January 2009 to April 2012, only 27 patients have complete medical record. And in West Java, the number of hypospadias cases from 2010 to 2012 are reported to be 120 cases [6-7].

Hypospadias is also associated to other anomalies. The most common anomalies related to hypospadias are inguinal hernia and undescended testis (UDT). These anomalies appeared on 7-13% of hypospadias patients with greater occurrence on proximal hypospadias cases [1]. Approximately 10% of boys with hypospadias have undescended testis [8]. Hypospadias and UDT are often diagnosed as Disorders of Sex Development (DSD) as criteria that suggest DSD include overt genital ambiguity, apparent female genitalia with an enlarged clitoris, posterior labial fusion or an inguinal/labial mass, apparent male genitalia with bilateral undescended testes, hypospadias or micropenis, and discordance between prenatal karyotype

and genital appearance [9]. When hypospadias is found with other criteria of DSD including undescended testis, it requires an evaluation with karyotype screening [1]. There has been no prevalence study on hypospadias with undescended testis in Indonesia. This prevalence study aimed to determine the prevalence of hypospadias with undescended testis in the Department of Surgery Mohammad Hoesin Hospital Palembang in Indonesia.

## 2. RESEARCH METHOD

This prevalence study has been done in Medical Records Department of Mohammad Hoesin Hospital Palembang from July 2018 to February 2019. The sample of this study was those fulfilling the inclusion criteria which were all patients suspected of hypospadias in the Department of Surgery Mohammad Hoesin Hospital Palembang during the period of 2016–2017, and patients with completed medical reports. The data used in this study was secondary data obtained from Medical Records Department of Mohammad Hoesin Hospital. The data was derived from the medical records of patients who was treated by the Department of Surgery Mohammad Hoesin Hospital Palembang during 2016–2017 period. The data were analyzed using univariate analysis to produce descriptive table with several predetermined variables including the age group of the hypospadias patient, the hypospadias type, history of undescended testis in the hypospadias patients, and types of the undescended testis on hypospadias patients with undescended testis. The protocol has been approved by ethical committee of Faculty of Medicine Sriwijaya University.

## 3. RESULTS AND DISCUSSIONS

From the 183 hypospadias patients in Mohammad Hoesin Hospital during 2016–2017 period, 103 met the inclusion criteria.

### 3.1. Age groups of hypospadias patient

The patients were divided into several age groups, namely: 0–5 months, 6–11 months, 1–5 years old, 6–10 years old, 11–14 years old, and 15–19 years old. During 2016–2017, hypospadias patient on the age group of 1–5 years old was the most common in the Department of Surgery Mohammad Hoesin Hospital with 51 patients (49.5%). It was followed by 6–10 years old with 34 patients (33%), 0–5 months with 8 patients (8%), 11–14 years old with 7 patients (7%), and 6–11 months with 2 patients (1.9%). The least common age group of the hypospadias patient was 15–19 years old with 1 patient (1%). Table 1 shows the groups of age among patients.

Table 1. Hypospadias based on age groups in Department of Surgery Mohammad Hoesin Hospital 2016–2017

Age group	n	%
0 – 5 months	8	7.8
6 – 11 months	2	1.9
1 – 5 years	51	49.5
6 – 10 years	34	33.0
11 – 14 years	7	6.8
15 – 19 years	1	1.0
Total	103	100

The most common age group of hypospadias patients in Mohammad Hoesin Hospital during 2016–2017 period was 1–5 years old with 51 patients (49.5%). The optimal age of genital operation is between 6 to 12 months [10]. If the operation could not be done earlier or the anomaly was found when patient was 1 year old or above, the opportunity to have the operation at the age of 3–4 years old is still possible [11]. However, in developing countries due to late awareness, ignorance of the anomaly, and unaffordability to have the operation, the average age of hypospadias patients brought to hospital is 5 years old [12]. These may also be the reasons to why the most common age group of hypospadias patient is 1–5 years old.

### 3.2. Classification of hypospadias

Based on the classification of hypospadias, the most common type of hypospadias was severe hypospadias with 71 patients (68.9%). Meanwhile, 18 patients (17.5%) have moderate or middle hypospadias, and 14 patients (13.6%) have mild hypospadias. Table 2 reveals the severity among patients.

Table 2. Divided severity of hypospadias

Type of hypospadias	n	%
Mild Hypospadias	14	13.6
Middle Hypospadias	18	17.5
Severe Hypospadias	71	68.9
Total	103	100%

Majority of severe hypospadias in the Department of Surgery Mohammad Hoesin Hospital were penoscrotal hypospadias which meatus urethra externus located between proximal shaft of penis and scrotum. This result corresponds to Itesako *et al.* research which reported severe hypospadias as more common than moderate hypospadias and mild hypospadias [13]. However, this result differs to what is reported in other literature where the most common type of hypospadias was mild hypospadias with 50% or 65–70% of all hypospadias cases in world [1, 14]. The number of mild or distal hypospadias patients was the smallest in Mohammad Hoesin Hospital Palembang might be caused by the unawareness of patients with mild hypospadias on their condition resulting to them not coming to the hospital for examination and treatment or because Dr. Mohammad Hoesin Hospital Palembang is the top hospital in the region so severe hypospadias cases were referred or directed to the hospital more.

### 3.3. History of undescended testis in hypospadias patients

The majority of hypospadias patients did not have undescended testis with 96 patients (93.2%), while the other 7 patients (6.8%) have a history of undescended testis. Table 3 describes the history of undescended testis among patients.

Table 3. History of undescended testis in hypospadias patients

History of Undescended testis	n	%
Have	7	6.8
No	96	93.2
Total	103	100

Compared to other studies of hypospadias with undescended testis, this study has similar result. In the study by Itesako *et al.*, from 466 hypospadias patients, 29 patients (6.2%) have congenital undescended testis and 15 patients (3.2%) have acquired undescended testis [13]. And from Wu *et al.* research, 26 of 352 hypospadias patients (7.3%) have undescended testis [15].

### 3.4. Type of undescended testis and hypospadias in hypospadias patients with undescended testis

Of the seven hypospadias patients with undescended testis, not only three hypospadias patients (42.85%) with bilateral undescended testes, but also three patients (42.85%) with left undescended testis. On the other hand, only one patient (14.3%) with history of right undescended testis is shown in Table 4.

Table 4. Classification of undescended testis in hypospadias patients with history of undescended testis

Types of Undescended Testis	n	%
Bilateral	3	42.85
Left	3	42.85
Right	1	14.3
Total	7	100%

Table 5 shows that five patients (71.4%) with severe hypospadias. It was the most common types of hypospadias among hypospadias patients with history of undescended testis. Meanwhile, not only one patient (14.3%) has mild hypospadias, but also moderate hypospadias only have one patient (14.3%).

Table 5. Type of hypospadias with history of undescended testis

Type of Hypospadias	N	%
Mild Hypospadias	1	14.3
Moderate Hypospadias	1	14.3
Severe Hypospadias	5	71.4
Total	7	100%

This result is in line with Wu *et al.* study that reported that from three types of hypospadias— anterior hypospadias, mid-penile hypospadias, and posterior/proximal hypospadias—undescended testis was most common on patients with posterior hypospadias than the others [15]. Similar result was reported by Itesako *et al.* Study where congenital undescended testis and acquired undescended testis appeared most on proximal or severe hypospadias [13]. According to Taisen *et al.* study, risk of undescended testis in hypospadias patients is higher on patients with proximal hypospadias, however the risk factors associating hypospadias and undescended testis is still unclear so the reasons to why undescended testis most often appeared on proximal hypospadias than the other types is still unknown [13, 16].

### 3.5. Age group in hypospadias patients with undescended testis

Table 6 reveals that the most common age group of hypospadias patients with undescended testis was 1–5 years old with 5 patients (71.4%).

Table 6. Age groups of hypospadias patients with history of undescended testis

Age groups	n	%
0 – 6 months	1	14.3
1 – 5 years	5	71.4
6 – 10 years	1	14.3
Total	7	100%

Diagnosis and early treatment of undescended testis at the age of 6–12 months is important to prevent loss of germ cell and increase patient's fertility index especially as it is during those age that one's gonocyte changes into dark type Ad spermatogonia [17]. If operation on patients with undescended testis was carried out late, the patient's risk of testicular cancer and infertility would increase. According to Pettersson *et al.*, the relative risk of testicular cancer on undescended testis patients who have done orchidopexy before 13 years old was 2.23 and after 13 years old was 5.40 [18]. As reported by Shiryazdi *et al.*, the main reason to delayed treatment and early diagnosis of undescended testis was the failure of the physician in diagnosing undescended testis at birth or during follow-up period and the lack of awareness of the parents on the location of the testis, although this lateness can be prevented if diagnosis and treatment are done before the age of 18 months old [19].

## 4. CONCLUSION

Prevalence of hypospadias with undescended testis in the Department of Surgery Mohammad Hoesin Hospital during 2016–2017 period was 7 (6.8%) out of 103 hypospadias patients and the most common types of undescended testis was bilateral and left undescended testis with 3 patients each (42.85%). The most common age group on hypospadias patient with undescended testis was 1–5 years with 5 patients (71.4%). The most common type of hypospadias in hypospadias patients with undescended testis is severe hypospadias with 5 patients (71.4%).

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