

# Surveillance of Male Genital Anomalies in Newborns: Experience in a Medical Center in Central Taiwan

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**Background/Purpose.** To determine the incidence of genital anomalies in male newborns.

**Methods.** During the period from July 1, 2002 to January 14, 2003, we examined the external genitalia of full-term male newborns who were present in the hospital nursery on Tuesdays and Fridays. A total of 269 male newborns were examined and enrolled in this study. The incidence rates of the following male genital anomalies in newborns were calculated: phimosis, undescended testis, scrotal hydrocele, inguinal hernia, hypospadias, and epispadias. The morphological types of phimosis were recorded using Kikiros' phimosis classification system.

**Results.** The incidence of phimosis was 99.3%. Hypospadias with incomplete prepuce was found in 0.7% of newborns. The incidence of undescended testis was 1.9% and that of retractile testis was 0.7%. Scrotal hydrocele was diagnosed in 6.3% and inguinal hernia was diagnosed in 0.4% of the newborns. There were no cases of epispadias. The types of undescended testes were inguinal in 4 and prepubic in 1 newborn. Scrotal hydroceles were left-sided in 2, right-sided in 6, and bilateral in 9 neonates.

**Conclusion.** The incidences of penile anomalies (phimosis and hypospadias) were higher and the incidences of testis-related anomalies (undescended testis, scrotal hydrocele, and inguinal hernia) were lower than those reported in Europe and North America. Further study is necessary to investigate whether the differences are caused by the limitation of the hospital-based study or by differences in ethnicity. (*Mid Taiwan J Med* 2008;13:95-9)

## Key words

male genital anomalies, neonatal screening, surveillance

## INTRODUCTION

Genitourinary examination is a routine part of the physical examination of newborn babies. The procedure is important because many anomalies of the genitalia are associated with abnormalities in other organ systems.

The incidence rates of male genital anomalies are well known in Europe and North America. In those regions, the prepuce is unretractable behind the glans penis in 96% of babies at birth. By the age of 3 years, however,

90% of foreskins are retractable [1]. Undescended testes (UDT) affect 3.4% of full-term neonates, and approximately 30.3% in premature infants. The incidence of UDT decreases to between 0.8% and 1.5% in neonates at the age of 1 year [2,3]. Communicating hydrocele occurs in 6% of full-term male neonates [4]. The incidence of inguinal hernia ranges from 1.0% to 4.4% in full-term neonates, and is greater than 13% in premature infants [5]. The incidences of hypospadias and epispadias in male infants are 1 in 300 and 1 in 117,000, respectively [6-9]. However, data regarding the incidence rates of these genital anomalies in Taiwan are lacking. Therefore, we conducted a hospital-based study to determine the

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incidence rates of male genital anomalies in neonates born at the China Medical University Hospital (CMUH) in Taiwan.

### MATERIALS AND METHODS

From July 1, 2002 to January 14, 2003, a total of 688 boys were born at the CMUH. The subjects chosen for this study comprised male neonates who were present in the hospital nursery on Tuesdays and Fridays during the study period. Each newborn underwent a detailed genital examination by a pediatric urologist. At the end of the study period, a total of 269 male newborns (39% of 688) had been examined and served as the study population.

The neonates were examined for the presence of phimosis, UDT, scrotal hydrocele, inguinal hernia, hypospadias, and epispadias. The incidence rates of male genital anomalies were then calculated. Neonates with UDT were also evaluated for the presence of UDT-related diseases, such as scrotal hydrocele and inguinal hernia.

The morphological types of phimosis were classified according to Kikiros' phimosis classification [10,11]. This classification system comprises 6 types. Type 0 refers to a prepuce that can be completely retracted behind the glans penis; in type 1, the prepuce is tight, but fully retractable; type 2 refers to a prepuce that can be partially retracted to expose part of the glans penis; in type 3, the prepuce is very tight but can be retracted to show the urethral meatus; in type 4, the prepuce is slightly retractable and the inner prepuce can be exposed partially; type 5 refers to a completely unretractable prepuce with a pinpoint opening [10,11].

### RESULTS

The mean gestational age of the neonates in our series was  $275 \pm 11$  days. The mean birth body weight was  $3161 \pm 106$  g. Physical examination was performed at a mean of 1.5 days after birth (range, 0 to 8 days).

Physiological phimosis was present in 99.3% of male newborns. The majority of

neonates had type 3 ( $n = 56$ , 20.8%) or type 5 ( $n = 134$ , 49.8%) phimosis. Types 2 and 4 were present in 13.8% ( $n = 37$ ) and 14.9% ( $n = 40$ ) of neonates, respectively. None of the neonates presented with type 0 or type 1 phimosis. Hypospadias with incomplete prepuce was found in 2 of the 269 (0.7%) male newborns.

UDT was detected in five (1.9%) neonates; it was of the prepubic type in 1 and of the inguinal type in 4 neonates. The right-to-left ratio was 3:2. Two newborns had retractile testes (0.7%). Scrotal hydrocele was noted in 17 (6.3%) neonates; left-sided hydrocele was detected in 2, right-sided in 6, and bilateral hydrocele was noted in 9 neonates. Among the newborns with bilateral scrotal hydroceles, swelling was right-sided dominant in 6, and bilaterally equivalent in 3 infants. Left-sided inguinal hernia was detected in 1 neonate (0.4%) (Table). There were no UDT-related scrotal hydrocele or inguinal hernia in our series.

### DISCUSSION

To the best of our knowledge, this is the first study to survey male genital anomalies in newborns in Taiwan.

The incidence rates of hypospadias with incomplete prepuce and phimosis in our study are 0.7% and 99.3%, respectively, compared with 0.33% and 96%, respectively, in Europe and North America [1,6-8]. The foreskin was unretractable behind the glans penis at birth in all boys except in those with hypospadias. The penile anomalies found in our study are more prevalent than those reported in Caucasians. Further study

**Table. The incidence rates of male genital anomalies in newborns born at China Medical University Hospital**

Anomaly	Incidence n (%)
Physiological phimosis	267 (99.3)
Hypospadias with incomplete prepuce	2 ( 0.7)
Epispadias	0 ( 0.0)
Undescended testis	5 ( 1.9)
Retractile testis	2 ( 0.7)
Communicating hydrocele	17 ( 6.3)
Hernia	1 ( 0.4)

is needed to investigate whether the difference is caused by limitation of the hospital-based study or by differences in ethnicity.

Undescended testis is a condition in which the testes are arrested at some point in their normal path of descent. The condition can be classified into abdominal, inguinal, and prepubic types. The latter is the most common [12]. In this study, five patients had UDT (1.9%); of them, 4 had the inguinal type and 1 had the prepubic type. The difference in prevalence of type of UDT may be due to the low incidence of UDT in our study. Retractable testes are those that intermittently retract from their normal location within the scrotum to an extrascrotal position. The reported prevalence ranges from 0.45% to 1.3% in school-age boys [13,14]. In our study, only 0.7% of the newborns had UDT. Retractable testis has a 32% risk of becoming an ascending or acquired undescended testis. The risk is higher in boys younger than 7 years old and in those with a tight or inelastic spermatic cord. Therefore, these individuals should be followed annually until the testes have fully descended [15].

In our study, the incidence of scrotal hydrocele was 6.3%. Hydrocele was left-sided in 2, right-sided in 6 and on both sides in 9 of the neonates. In those with bilateral scrotal hydrocele, the scrotal size was more pronounced on the right side in 6 and equally distributed in 3 neonates. Such a high incidence of right-sided dominant scrotal hydrocele in neonates has never been reported.

In our study, left inguinal hernia was seen in only one patient (0.4%). The screening process included evaluating neonates for the presence of the silk sign or an inguinal bulging mass. However, this screening method would not detect the condition in patients who did not present with the disease during screening; therefore, the incidence of inguinal hernia might be underestimated.

In conclusion, all foreskins of male neonates born at this institute were unretractable behind the glans penis at birth except in newborns

with hypospadias. In our series, the dominant type of UDT was inguinal rather than prepubic. Furthermore, scrotal hydrocele was right-sided dominant in boys born at the CMUH. The incidence rates of penile anomalies (phimosis and hypospadias) were higher and the rates of testis-related anomalies (undescended testis, scrotal hydrocele, and inguinal hernia) were lower than those reported in Europe and North America. Further study is necessary to investigate whether the differences are due to the limitation of the hospital-based study or due to differences in ethnicity.

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## 新生男嬰生殖器異常之檢測：一個中台灣醫學中心的經驗

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**背景/目的** 爲了瞭解男性新生兒生殖器異常的確實發生率，我們在中臺灣一個醫學中心進行這個研究，來篩選男性新生兒外生殖器的異常。

**方法** 在2002年7月1日至2003年1月14日間，每週二及週五在嬰兒室的所有男性新生兒(共269位，占同時期出生男嬰的39%)被選定來檢查他們的外生殖器，以記錄其外生殖器異常的發生率，包括包莖、隱睪症、陰囊水腫、腹股溝疝氣、尿道下裂和尿道上裂等。包莖的形態是用Kikiros包莖分類法來記錄。

**結果** 在這些足月生產的男嬰中，發現有二位(0.7%)尿道下裂，其他99.3%全部爲生理性包莖，沒有一位可以露出整個龜頭。有五位(1.9%)隱睪症被查出，其中四位是腹股溝型、一位是恥骨前型。而且有二位(0.7%)伸縮性睪丸。十七位(6.3%)陰囊水腫被篩檢出來，其中二位在左邊，六位在右邊，九位是兩邊。只有一位男嬰(0.4%)有左側腹股溝疝氣。

**結論** 在本醫學中心出生的臺灣新生兒隱睪症以腹股溝型占絕大部分，陰囊水腫以右側居多。且與西方國家比較，我們有較高的生理性包莖和尿道下裂的發生率及較低的隱睪症、陰囊水腫和腹股溝疝氣的發生率。這些差異須要進一步研究來回答是肇因於醫院型研究的限制或是種族的差異。(中台灣醫誌 2008;13:95-9)

### 關鍵詞

男性生殖器疾病，新生兒篩檢，檢測

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