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Prevalence and Pathological Features of Cryptorchidism among Iranian Children in Yazd Province, Central Iran

Abdolhamid Amooei [1], *Saeid Kargar [2]

[1]Department of Pediatric Surgery, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
[2]Department of Surgery, Shahid Sadoughi University of Medial Sciences, Yazd, Iran.

Abstract

Background

Cryptorchidism is defined the failure of one testis or both testes to permanently descend. It is considered as the most common congenital abnormalities. The risk of testicular cancer in men with a history of cryptorchidism increased from three fold to four fold, compared to those without history of cryptorchidism. We aimed to investigate prevalence and pathological features of cryptorchidism among Iranian Children in Central Iran.

Materials and Methods

In this analytical descriptive study, 61 boys with a diagnosis of cryptorchidism who referred to training hospitals of Yazd city, Yazd province (Central Iran) from January 2016 to January 2017, were enrolled. Information including demographic data was extracted from medical records. Data including testicular properties and localization of undescended testes were evaluated by surgeon. Data analysis was done using SPSS software version 19.0.

Results

Prevalence of disease in full term infants and premature were 3.27% and 29.5%, respectively. The most number of boys with cryptorchidism (22 cases) refereed to hospitals were in range of 12-24 months; 17 patients (27.86%) had history of family, and palpable testicles and non-palpable testicles were observed in 53 patients (84.1%), and 10 (15.87%), respectively ($P<0.05$). Furthermore, 30, 21 and 10 cases had right testicle, left and bilateral testicle, respectively.

Conclusion

The prevalence of cryptorchidism was relatively high in our province. It seems that geographical, environmental, and genetic variations play a main role in the birth prevalence of these anomalies. In addition, the epididymal anomalies were observed in less than half of patients.

Key Words: Infants, Cryptorchidism, Iran, Premature, Prevalence, Testis.

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Corresponding Author:

Saeed Kargar (M.D), Department of Surgery, Shahid Sadoughi University of Medical Sciences, Yazd, Iran; Fax: 035-36235958

Email: Saeedkargar@yahoo.com

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1- INTRODUCTION

Cryptorchidism is defined the failure of one testis or both testes to permanently descend (1). The incidence of cryptorchidism was observed in 3% of infants in Iran (2). Cryptorchidism can reflect a main endocrine or genetic disorder (3). It is considered as the most common congenital abnormalities (1). It is happened in 1- 45% of male preterm neonates and in 3–5% of male term infants (4). The risk of testicular cancer in men with a history of cryptorchidism increased from three fold to fourfold, compared to those without history of cryptorchidism (1). Primary diagnosis is often dependent on primary care physicians, such as pediatricians, family physicians, and nurse practitioners (4). The best time for diagnosis of cryptorchidism is at birth (5).

Delayed diagnosis of cryptorchidism may lead to male fertility and early detection may reduce the harmful effects of cryptorchidism (6). Studies reported that factors including geographical and temporal variation play a main role in the birth prevalence of these anomalies. The cause of these variations is vague (7). Several hypotheses are proposed for this etiology. Maternal smoking, diabetes mellitus and genetic modification can increase the risk of cryptorchidism (8).

Moreover, environmental factors (such as persistent organochlorine compounds, mono-esters of the phthalates) play an important role. Synthetic chemicals may be as endocrine disruptors. It is suggested that fetal androgen dysfunction plays a role in etiology (7). Placental dysfunction with decreased secretion of human chorionic gonadotropin (hCG) may be responsible for hormonal and other disturbances during the fetal period of life (8). The major treatment for cryptorchidism is the surgical repositioning of the cryptorchid testis into the scrotum (9-11). Before maturation, performing orchiopexy decreases the subsequent risk of testicular cancer. So that performing orchiopexy after age 12 years increases testicular cancer from twofold to six fold in comparison to those who receive the treatment before the age of 12 years (11). Since incidence and pathological features of cryptorchidism in our province are not known, the aim of this study was to evaluate classification, incidence and pathological features of cryptorchidism.

2- MATERIALS AND METHODS

2-1. Study design and population

In this analytical descriptive study, 61 boys with a diagnosis of cryptorchidism referred to training hospitals of Yazd city, Yazd province (Central Iran) from January 2016 to January 2017 were enrolled. Written consent was taken from parents to participate in the study.

2-2. Methods

Information including child's age, mother's weight and height, mother's age during pregnancy, associated anomalies, ultrasound results, birth weight, family history, prematurity, etc. were extracted from medical records and entered to checklist.

2-3. Evaluating Parameters

All boys (with a diagnosis of cryptorchidism) underwent surgery. Separation of epididymis and hernial sac was determined by surgeon. Testicular properties including palpable testicles and non-palpable testicles, left and right testicles was detected by Surgeon.

2-4. Inclusion and exclusion criteria

In current study, all children with cryptorchidism were enrolled to study (who referred to training hospitals of Yazd city, during Jan 2016 to Jan 2017). Unwillingness of patients to participate in the study caused patients exclude from the

study. Moreover, patients with incomplete reason were excluded from the study.

2-5. Data Analysis

Statistical analysis was performed by SPSS version 19.0 software. For comparison of associated anomalies (positive and negative), we used Chi-Square test. P-value less than 0.05 were considered statistically significant.

3- RESULTS

The aim of this study was to investigate the prevalence and pathological features of cryptorchidism in central of Iran; so 61 boys with cryptorchidism and the mean age of 18.29 ± 0.724 months, were studied. Moreover, 47 boys (77.04%), and 14 (22.95%) were diagnosed by physician and parents, respectively. Prevalence of disease in full term infants and premature was 3.27% and 29.5%, respectively. Moreover, 17 patients (27.86%) had history of family and 44 patients had not history of family. All patients were underwent surgery.

Furthermore, 31 patients were recommended for surgery before 1 year, 14 cases between 1-2 years, 1 case after 2 years and 6 cases were missed. Palpable testicles and non-palpable testicles were observed in 53 patients (84.1%) and 10 (15.87%), respectively. Moreover, right, left and bilateral testicle was seen in 30 (46.7%), 21(33.3%), and 10(16.39%) patients.

Demographic characteristics of children and their mothers are shown in **Table.1**. As shown in **Table.1**, mean gestational age was less than 38 weeks (37.7± 2.6 weeks). Frequency distribution of patients with cryptorchidism in terms of age in referred boys is shown in **Table.2**. As shown in **Table.2**, the most number of boys (36.6%) with cryptorchidism refereed to training hospitals are in range of 12-24 months. Testicular properties and side of cryptorchidism are shown in the mean age at consultation for boys with palpable and non-palpable testicles was 19.73 and 13.5 months, respectively ($p<0.01$). Moreover, 30, 21 and 10 cases had right testicle, left and bilateral testicle, respectively. Moreover, significant difference was observed between these groups in terms of side of cryptorchidism ($p=0.021$).

Frequency of associated penile anomalies in boys with cryptorchidism is shown in **Table.3**. As shown in **Table.3**, associated anomalies were observed in 21.31% of boys. Significant difference was observed between these boys in terms of anomalies ($p<0.01$).

Finding during surgery in boys with cryptorchidism is shown in **Table.4**. As shown in **Table.4**, separation of epididymis and hernia sac was observed in 62.29% and 86.8% of cases, respectively.

Localization of undescended testes in boys with cryptorchidism is shown in **Table.5**. As shown in **Table.5**, 52.4% of undescended testes are localized in inguinal distal canal region. Moreover, among intra- abdominal patients, 8(80%), and 2(20%) performed one stage and two stage surgery, respectively.

Localization of undescended testes in boys with cryptorchidism is shown in **Table.6**. As shown in **Table.6**, 52.4% of undescended testes are localized in inguinal distal canal region. Moreover, among intra- abdominal patients, 8(80%) and 2(20%) performed one stage and two stage surgery, respectively.

Table-1: Demographic characteristics of children with cryptorchidism and mothers

Variables	Mean ± SD
Mother's age during pregnancy (year)	28.70± 5.1
Mother's weight before pregnancy (kg)	63.37±10.42
Mother's height (cm)	159.31± 5.32
Gestational age (week)	37.7± 2.6
Birth weight (gr)	3021.3± 770.93
BMI (kg/m^2)	24.93± 6.02

BMI: Body mass index; SD: Standard deviation.

Table- 2: Frequency distribution of patients with cryptorchidism in terms of age

Age range (month)	Number (percent)
4-9	14(22.95%)
9-12	11(18.03%)
12< 24	22(36.6%)
> 24	14(22.95%)

Table-3: Frequency of associated anomalies in patients with cryptorchidism

Associated anomalies	Number (percent)	*P-value
Positive	13(21.31%)	0.001
Negative	37(60.65%)	
Missed value	11(18.03%)	
Total	61(100%)	

* Chi- Square test; P<0.01 is significant.

Table-4: Finding during surgery in boys with cryptorchidism

Findings during surgery	Number (percent)
Separation of epididymis	
positive	28(62.29%)
Negative	38(62.29%)
Hernial sac	
Positive	53(86.8%)
Negative	8(13.11%)

Table-5: Localization of undescended testes in boys with cryptorchidism

Localization of undescended testes	Number (percent)
Inguinal distal canal	32(52.45%)
Inguinal proximal canal	16(26.2%)
vanished testis	3(4.91%)
Intra-abdominal	10(16.39%)
Total	61(100%)

Table-6: Localization of undescended testes in boys with cryptorchidism

Localization of undescended testes	Number (percent)
Inguinal distal canal	32(52.45%)
Inguinal proximal canal	16(26.2%)
vanished testis	3(4.91%)
Intra-abdominal	10(16.39%)
Total	61(100%)

4- DISCUSSION

In current study, the most number of boys with cryptorchidism refereed to hospital were in range of 12-24 months. Mahmoudi et al., in their study reported that 54% of patients referred after 5 years of age (12). Although the recommended age for surgery is under one year, the time of referral is later than expected in this study (12). Kokorowski et al. reported that 43% of boys with cryptorchidism had surgery until the age of two years (13). They also reported that factors including patient race, insurance status, and kind of hospital can be played in the timing of orchidopexy (13). This study showed that significant numbers of boys with congenital cryptorchidism do not undergo surgery in this time interval. Point et al. also demonstrated that a majority of children performed the undescended testicle (UDT) later than current recommendations (4). It seems that factors such as patient race, hospital kind and surgeon type may be played in the timing of orchidopexy. Furthermore, improving the awareness and educating of parents may lead to earlier surgeries (14).

Chen et al. reported that surgery is main therapy for cryptorchidism (14). Ghorbanpoor et al. also reported that surgery is a golden method in the treatment of cryptorchidism (15). They reported that earlier surgery can reduce histopathological changes and prevent infertility (16, 17). Late orchiopexy has a harmful effect on future fertility (15). Pettersson et al., also reported that age at orchiopexy has an effect on testicular cancer risk. So that the risk of testicular cancer at 13 years was more than those treated at younger ages (18). It seems that the risk of testicular cancer increases with age at treatment (18). Another study reported that despite performing surgery for cryptorchidism, infertility was common in a third of boys. They also reported that after orchidopexy in boys, additional hormonal treatment may be indicated in patients with cryptorchidism. It seems that hormonal treatment for boys with cryptorchidism is related on the hypothesis of gonadotropin or androgen insufficiency manifesting during pregnancy (2). In our study, prevalence of cryptorchidism in full-term infants was 3.27% and premature infants 29.5% which was almost consistent with point et al., study (4). Kamali et al., performed a study in Zanjan province and reported that prevalence of cryptorchidism in full-term and premature infants was 7.85% and 47.37%, respectively (5). The birth prevalence for cryptorchidism in our study was lower than Kamali et al. study (5). Another study reported that the incidence of congenital cryptorchidism in full-term males at birth was 2% to 4%. McGlynn et al. observed that cryptorchidism was less than in boys of African than white boys in USA. It seems that risk of cryptorchidism may be different in diverse ethnic groups (11). It seems that the prevalence of cryptorchidism varies in different area. Geographical, environmental, and genetic variation play a main role in the birth prevalence of these anomalies.

Separation of epididymis was observed in 62.2 % of boys. Sharma et al., reported that complete testicular epididymal dissociation (CTED) was occurred in 8% of cases of cryptorchidism (19). Han and Kang reported that epididymal anomalies were more common in undescended testes (61%) than descended (43%) testes. They also reported that epididymal anomalies were powerfully associated with the patency of the vaginal processus is irrespective of testicular descent (20). In our study among 61 undescended testes, 32 located in inguinal distal canal. Mahmoudi et al. (12) reported that among 54 undescended testes, 36 located in inguinal canal and 13 intracanalicular. Joafshani et al. reported that with respect to anatomic site of descent cessation,

intracanalicular superficial inguinal pouch and intra-abdominal was found in 61.4%, 16.1% and 14%, respectively (2).

5- CONCLUSION

The prevalence of cryptorchidism was relatively high in our province. It seems that geographical, environmental, and genetic variations play a main role in the birth prevalence of these anomalies. Moreover, the mean age for surgery was not in golden age. Factors such as patient race, hospital kind and surgeon type (urologist or pediatric surgeon), may be played in the timing of orchidopexy. In addition, the epididymal anomalies were observed in more than half of patients.

6- CONFLICT OF INTEREST: None.

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