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Original Research Article

External genital abnormalities in male primary school children: importance of structured school health survey

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ABSTRACT

Background: Abnormalities of external genitalia are often under diagnosed in early childhood because of lack of awareness of parents about the anatomy of external genitalia and social inhibitions. These abnormalities, if left untreated, may lead to psychological, social, and sexual complication. Structured school health survey and awareness among parents can identify these abnormalities at early stage to avoid further complications later. Study was aimed at spreading awareness among parents of young children and school administration about importance of structured screening programme for detecting external genital abnormalities among the young boys to avoid various related complications later.
Methods: It was a cross-sectional study covering 586 male primary school children of class I to V aged 6-12 yrs of two Schools in a capital city in northern state of India. All participants were physically examined for external genital anomalies by a trained medical officer. Data collected were analysed using standard statistical software, Statistical Programme for Social Sciences (SPSS) 15.0.
Results: Abnormalities were detected in 84 (14.33%) children. Phimosis was commonest abnormality (7.5%), followed by Inguinal Hernia, Un-descended Testes, Hypospadias, Varicocele and Hydrocele. Children of parents having higher educational level were found having lesser prevalence of abnormalities.
Conclusions: Diagnosis and management of abnormalities of external genitals of children is delayed due to lack of awareness among parents. Careful screening of these abnormalities at pre-school and school age, increased public awareness and early referral of children is very important to avoid the risk of having urogenital complications during adulthood.

Keywords: External genital abnormalities, Hernia, Phimosis, Primary school children, School health survey

INTRODUCTION

The birth of offspring in any family is considered a moment of eternal joy in any family. Parents consider them lucky having the enjoyment of rearing their child in front of them. However, due to lack of adequate knowledge, they miss to recognize some important external genital abnormalities in male children, which represent the most common congenital anomalies in boys during childhood.[1] Prevalence of external genital abnormalities varies between 3.4% to 18.7%.[1-4] Phimosis is the commonest external genital abnormality followed by Inguinal Hernia, Hypospadias, Hydrocele and Un-descended Testes.[2,5-11] Early diagnosis and treatment of certain abnormalities is of great importance for avoiding future health problems and fertility potential of children. School health survey is the earliest structured medical examination after infancy.

A routine school health survey in capital city of a hilly province in India was augmented with well trained medical officer to identify the magnitude of external genital abnormalities among male children of 6-12 years. Authors also noticed an association between literacy level of parents with prevalence of abnormalities and treatment sought. Lesser proportion of external genital abnormalities was observed in children of more educated parents.

METHODS

It was a cross sectional study conducted in two government schools of a city in foot hills of Himalayas where 586 male children of two schools were examined for external genital abnormalities during routine annual school health survey between July 2015-August 2015. Before starting the study written consent was taken from parents and principal.

A structured Performa was suitably modified to include external genital abnormalities in particular. All the children of class I-V, aged 6-12 years with informed consent of children of parents, present on the days of examination in the school underwent physical and careful clinical examination of the groin region, scrotum and penis before and after straining (cough reflex). All children were examined in presence of a teacher or parent in a room at normal temperature in supine and upright position. Past medical history and history of any surgery was taken from parents through Performa filled and signed by parents along with consent. Children not willing to have examination, not having consent from parents or absent on the day of examination were excluded from the study.

Out of total 609 children enrolled for the study, 586 were examined. Examination of urogenital region was done by a trained medical officer under the guidance of surgeon.

All raw data collected on Performa entered into a Microsoft Excel Spreadsheet and analysed using standard statistical software, Statistical Programme for Social Sciences (SPSS) 15.0 for Microsoft Windows (SPSS Inc. Chicago, IL, USA), Children having any abnormality were referred for surgical treatment and follow up.

RESULTS

Among total of 586 boys (Table 1), external genital abnormalities were detected in 84 children (14.33%).

Phimosis was detected in 44 (7.75%) and had indirect Inguinal Hernia in 22 (3.75%), While 12 (2.04%) children had Undescended Testes. Hypospadias, Varicocele and Hydroceles were present in two (0.34%) each (Table 2).

Table 1: Age profile of study participants (n=586).

Age (in completed years)	Number (%)
6	112 (19.11)
7	56 (9.56)
8	107 (18.26)
9	115 (19.62)
10	136 (23.21)
11	46 (7.85)
12	14 (2.39)

Table 2: Prevalence of external genital abnormalities (n=586).

External genital abnormalities	N (%)	95% CI
Total	84 (14.33)	11.59-17.43
Phimosis	44 (7.75)	5.74-10.25
Inguinal hernia	22 (3.75)	2.36-5.62
Undescended Testes	12 (2.04)	1.06-3.54
Hypospadias	2 (0.34)	0.004-1.25
Varicocele	2 (0.34)	0.004-1.25
Hydrocele	2 (0.34)	0.004-1.25

The difference between phimosis and other urogenital anomalies is also statistically significant p=0.0033

Indirect inguinal hernia was more common on right side (77.27%) as compared to left (13.63%). Bilateral Inguinal Hernia was observed in 9.09%. Inguinal Hernia co-existed with Undescended Testes in six children (13.63%), Hypospadias in one child (2.72%), and Varicocele one child (2.72%) respectively.

Of the children with undescended testes, seven (58.33%) had right Undescended Testis, three (25.0%) left and two (16.67) bilateral. Undescended Testis associated with indirect inguinal hernia were found in six children (50%), whereas undescended testis associated with Hypospadis was found in one child (8.33%). Two children were diagnosed with Hypospadias and both were having proximal Hypospadias. None had surgery for hypospadias. Left Varicocele was found in two children, one each in aged 11 and 12 years and left Varicocele associated with Inguinal Hernia was seen in one (50%) child. None had surgery for varicocele. Overall, external genital abnormalities were most prevalent in seven year old children, and Phimosis and hernia being commonest among eight year old group. The prevalence between age groups was significant not only for overall abnormalities, but individually also for Phimosis, Inguinal Hernia, and Undescended Tests (Table 3). Ambiguous genitalia was found in one child who has female-like external genitalia in the form of bifid scrotum, small right testis, undescended left testis, short penis with proximal penile Hypospadias and morbid obesity. The education level of parents had significant difference in prevalence of abnormalities and seeking the treatment for their children (Table 4).

Table 3: Age specific prevalence of external genital abnormalities.

External genital abnormality	6 yr (n=112)	7 yr (n=56)	8 yr (n=107)	9 yr (n=115)	10 yr (n=136)	11 yr (n=46)	12 yr (n=14)	Total	P value
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Total	18 (16.07)	13 (23.21)	15 (14.02)	16 (13.91)	13 (09.56)	7 (15.21)	2 (14.29)	84 (100)	0.0001
Phimosis	08 (07.14)	08 (14.28)	10 (17.85)	8 (6.96)	6 (4.41)	3 (6.52)	1 (07.14)	44 (52.38)	0.0001
Inguinal hernia	07 (6.25)	04 (3.47)	04 (7.14)	04 (3.73)	-	03 (6.52)	-	22 (26.19)	0.001
Undescended testes	02 (1.78)	-	1 (0.93)	3 (2.60)	6 (4.41)	-	-	12 (14.28)	0.00114
Hypospadias	1 (0.89)	1 (1.78)	-	-	-	-	-	2 (2.38)	0.10
Varicocele	-	-	-	-	-	1 (2.17)	1 (7.14)	2 (2.38)	0.10
Hydrocele	-	-	-	1 (1.30)	1 (0.73)	-	-	02 (2.38)	0.10

Table 4: Parent's education and treatment taken for abnormalities.

	Parent's education				P value
	10th (n=198)	12th (n=236)	Graduate (n=198)	Postgraduate (n=198)	
External genital abnormalities (n=84)	38(19.19%)	31(13.14%)	12(10.26%)	3(08.57%)	<0.05
Treatment taken (n=14)	01(0.51%)	03(01.27%)	05(04.27)	05(14.28%)	<0.05

DISCUSSION

Phimosis, Hernia, Undescended Testes and Hydrocele are common urogenital anomalies in children.[1-3,5-11] Children with Phimosis are brought by parents with complaints of ballooning during micturition, difficulty in retracting the prepuce and long prepuce.[9] Phimosis is one of the frequent causes of UTI in boys. At three years of age approximately 10% male children have phimosis.10. In our study results were comparable to this study however in a population based study physiological Phimosis has been observed up to 44% boys at six years of age.[11] Hernia can be life threatening or can result in loss of testes or a portion of the bowel if incarceration and strangulation occur. Timely diagnosis and operative therapy are important if these complications are to be avoided.[2] The incidence of indirect inguinal hernia in the general population is approximately 1%-5%.[2,3,5] In our study 3.75% of the male schoolchildren aged 6-12 years had Inguinal Hernias. Direct Inguinal Hernia and femoral hernia in children are extremely rare and represent a small percentage in most studies. The incidence of Hydrocele among male infants is largely unknown. The incidence of isolated (non-communicating) Hydrocele in children older than one years of age is probably between 0.8-1.5%.[2,5,11] In this study 0.34% children had Hydrocele, probably because of the higher literacy of parents as compare to other studies.

Non descent of testis in the adult population is not common. Approximately 50% occur on the right side, 25% on the left and 25% bilaterally. Infants born prematurely have an eight times greater incidence of undescended testes than infants born at term.[3] By the time the infant reaches one year of age, the incidence is 10 times greater, ie incidence is approximately 5.4% in infants born prematurely and 0.5% in infants born at term.[11] Undescended Testes or delayed repositioning of testes interferes with germ cell development and spermatogenesis, thus leading to decreased fertility, besides having a higher probability of developing testicular malignancy in later life, if surgical correction not done in early childhood. The latest guidelines recommend that to minimize the chances of testicular cancers and decreased fertility in later life, surgery should be performed before first birthday of child.[12]

The incidence of undescended testis in children aged 6-13 was between 0.8 to 1.2 percent.[1-3] In our study 2.04% of the children had Undescended Testis. The incidence of Hypospadias has been estimated to be between 0.33 and 8.2 per 1000 live male births.[3,10] In children aged more than six years prevalence varies between 0.30 to 0.65 among hospital and community based studies in middle east Asian countries.[1,2] This variation probably represents geographic and racial differences. Ventral penile curvature associated with Hypospadias have more difficulty in intercourse, psychological issues because of penile appearance and maintaining straight flow of urine

at the time of urination, besides having psychosocial issues.[13] Prevalence of 0.34% in this study is in sync with many studies.

Varicocele is recognized as one of the most frequent causes of male infertility. Various studies in Iran and middle east Asian countries have reported prevalence of 0.1 to 2.11% in general population in 3-12 year age group.[2,5] It was found that none of the child up to 10 years of age in our study had Varicocele, despite the overall prevalence being 0.34%. Although the relationship between Varicocele and male infertility has not been completely resolved, it is generally accepted that Varicocele causes functional disturbances of the testes and that semen quality improves after operative correction of Varicoceles.[2]

Although we considered using the cough reflex as the method to detect the cough impulse of hernia, it was sometimes difficult to use with children. When it failed, it was followed with palpation of the hernia sac if present. As a result, the Inguinal Hernia prevalence rate was probably slightly less than the actual figure. A prevalence of Hydrocele of 0.34% is feasible and correlates with international figures.[2,5,7] All impalpable testes or those palpable in inguinal canal which could not be brought to the scrotum after careful examination were considered undescended, while those testes which could be brought to the scrotum after careful examination were considered retractile. Our rate of 2.04% for undescended testes may be slightly high but is acceptable in comparison with international studies.[2,3,5] Prevalence of Hypospadias of 0.34% correlates with various studies in community and hospital settings.[1-3,6] No cases of middle Hypospadias were found in our study. Prevalence of left varicocele of 0.34% is comparable to similar age groups elsewhere.[1,2,5] Parents having higher level of education had significantly higher proportion of reporting to medical facilities for treatment.

CONCLUSION

Inguinal Hernias and external genitalia abnormalities are common in pre school and school children. These abnormalities are usually not diagnosed in pre school children because of poor knowledge of parents about anatomy of external genitalia, shyness to talk about genitals and low literacy status leading to delay in the diagnosis and management of children in this age group. Detection of these abnormalities in older children indicates an obvious delay in the diagnosis and management of children in this age group. School health survey being the first structured health examination of children assumes paramount importance. Careful screening of children at preschool and school age is necessary to avoid later complications. Increased public awareness and early referral of such abnormalities are very important to avoid psychosocial complications in life.

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