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A Study of Inguinal Hernia in Infants and Children.

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ABSTRACT

Background: Inguino-scrotal swellings are frequently observed in patients of pediatric age group. Inguinal hernia and Hydrocele are the most common causes of such swellings in children. For their effective management, it is essential to study various factors like age, sex etc. associated with inguinal hernia in pediatric age group. **Objectives:** To study the epidemiology, management and outcome of inguinal hernia in children. **Methods:** A prospective study was conducted on pediatric patients with inguinal hernia for a period of 18 months, between February 2015 to July 2016. Patients from newborn to 14 years of age were selected for this study. **Results:** Inguinal hernia can occur at any age, but the majority of patients are seen between 1 to 5 years of age. It is more commonly seen in male children and incidence is slightly higher on right side. Almost all of the inguinal hernia in pediatric age group is of indirect type, which develops due to congenitally patent processus vaginalis. **Conclusion:** Early surgical intervention in form of Inguinal herniotomy is the most appropriate management of inguinal hernia in children.

Keywords: Inguinal hernia, Pediatric, Herniotomy, Hydrocele.

INTRODUCTION

Inguino-scrotal swellings are one of the commonest anomalies in pediatric age groups. Most of them are related to the abnormalities of descent of testis and failure of obliteration of processus vaginalis.[1] Among these, the most common congenital anomalies are inguinal hernia and Hydrocele. The incidence of inguinal hernia is even higher in preterm babies. Because of the advancement of treatment for infertility and of improvement of intensive neonatal care in last few decades, the survival of premature babies is increasing and as a result, it has indirectly increased the incidence of inguinal hernia and hydroecele in pediatric age group.

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Inguinal hernia in pediatric age group is mostly diagnosed by pediatrician and pediatric surgeons on the basis of history (given by the parents) and clinical examination of the child. Investigations are mainly done to rule out the associated anomalies. Once the diagnosis is confirmed, surgical closure of patent processus vaginalis (inguinal herniotomy) is the most common treatment in pediatric age group. Although laparoscopic repair is an established treatment for inguinal hernia in adults, still it has got little role in the repair of pediatric inguinal hernias. Some surgeons favor the repair of inguinal hernia in pediatric age group by laparoscopic procedure, especially for bilateral cases.

This study is intended to find out the relation of various factors like age, sex, side, maturity etc. with inguinal hernia in children, and also to find out the associated anomalies and outcome of surgical intervention in pediatric patients with inguinal hernia in our hospital.

MATERIALS AND METHODS

The present study is a prospective study in the department of surgery of Index Medical College Hospital and Research Centre, Indore during a period of 18 months from February 2015 to July 2016. Pediatric patients of inguinal hernia, from newborn to 14 years of age, were selected for this study. Total number of patients studied during this period was 60. Children with congenital hydrocele were excluded from this study.

Inguinal hernia was diagnosed by taking thorough history from the parents, followed by clinical examination of inguino-scrotal region of patients. Patients were admitted in surgical ward and basic investigations were performed in all cases, while special investigations like USG abdomen and

inguinal scrotal region were performed in selected cases only.

After proper pre-operative evaluation and pre-anesthetic checkup, all patients were operated for correction of the defect. All patients were operated under suitable anesthesia (General anesthesia with caudal block/ Spinal anesthesia). Inguinal herniotomy was performed by Mitchell Bank's method in patients of less than one year of age (herniotomy was done without opening the external oblique aponeurosis), while Fergusson's technique was performed for children of more than one year of age (herniotomy was done after opening the external oblique aponeurosis).

After discharge, all patients were asked to attend the surgical OPD for follow-ups, as and when required.

RESULTS & DISCUSSION

Following observations were made in the present study.

1. **Age distribution**

This study included patients from newborns to 14 years of age, which were divided in four categories on the basis of their age: Less than 1 year, 1 to 5 years, 5 to10 years and more than 10 years. Maximum incidence was seen in 1-5 years age group (53.3%). The youngest baby in this study was one month old.

Table 1: Distribution of cases according to age, sex, side, maturity and associated anomalies.

Parameter	Group	No. of cases	%
Age	< 1 year	14	23.3%
	1-5 years	32	53.3%
	5-10 years	9	15.0%
	> 10 years	5	8.3%
Sex	Male	53	88.3%
	Female	7	11.7%
Side	Right	37	61.7%
	Left	17	28.3%
	Bilateral	6	10.0%
Maturity	Full term	56	93.3%
	Preterm	4	6.7%
Associated anomalies	Undecsended testis	3	5.0%
	Umbilical hernia	4	6.7%
	Hypospadias	2	3.3%
	Vesical calculus	1	1.7%

Our observations are matching with the observations of Ravikumar et al[2] and Jadhav et al[3] , who have reported an incidence of 52% and 44%, respectively, in 1-5 years age group in their studies. Okuribido et al4 have reported an incidence of 47.4% in children from 3 to 7 years of age. Bronsther et al[5] have reported that one third of patients of their series were of less than 6 months of age.

2. **Sex distribution**

In our study, 53 children were males and 7 children were females, thus making a male to female ratio of 7.5:1. In other studies, male to female ratio ranged from 7:1 to 11.5:1. It was reported as 7:1 by Grossfeld et al[6], 6:1 by Poenarau7, 9:1 by Ravikumar et al[2] and 11.5:1 by Jadhav et al[3].

3. **Prematurity**

In our study, 4 babies were born before 28 weeks of gestation, while remaining infants were full term babies. Jadhav et al[3] have reported an incidence on 10% of prematurity in their study, while Ravikumar et al[2] have found it to be 30%. Other studies have shown an incidence 3.5 to 5% of inguinal hernia in full term babies and of 44 to 55% in preterm infants.[8,9]

4. **Side distribution**

In this study, we found a higher incidence of inguinal hernia on right side (61.7%). 28.3% hernia were left sided and 10 % were bilateral. Our observations matched with the observations of Jadhav et al[3] and Ravikumar et al[2] who have reported an incidence of 64% and 56% for right sided inguinal hernia in their studies, respectively. Similarly, Rowe et al[10] and Grossfeld et al[11] have also reported a higher incidence of inguinal hernia on right side.

5. **Associated anomalies**

The commonest associated anomaly found in our study was undescended testis, which was seen in 3 patients (5%). Out of these, in two cases, testis was present in superficial inguinal pouch, while in one case, it was in inguinal canal. Orchidopexy was performed in all cases along with inguinal herniotomy. Scorer et al[12] found that incidence of undecsended testis was 30.3% and 3.4% in preterm and full term newborn babies, respectively. According to Witherington et al[13], a patent processus vaginalis with undecsended testis is a clear indication for orchidopexy.

A reducible umbilical hernia was present along with inguinal hernia in 4 cases (6.7%) of our series. No surgical intervention was done for it, as all of them were of less than three years of age at the time of surgical repair of inguinal hernia. Two patients (3.3%) of our series had distal penile hypospadias and one patient had vesical calculus. Surgical correction was performed along with the surgery for inguinal hernia.

In our study, 7 female patients with inguinal hernia were additionally studied by USG abdomen to rule out intersex condition. No abnormality was found in any of the female patients. During surgery, ovary was found in hernia sac of one female patient.

Two patients (3.3%) of our series had presented with incarcerated hernia, with the features of intestinal obstruction. After performing the manual reduction successfully, surgical repair of hernia was done after 48 hours. Rowe et al[10] have recommended elective surgery after reduction in such cases, as the rate of

complications is low as compared to the emergency surgery (1.7% vs 22.1%)

We did not find any case of direct hernia in our study. Direct inguinal hernia are rare in pediatric age group and they represent only 0.5% of all groin hernia.[14,15] One male patient in our series had right sided sliding hernia which was containing cecum inside it. Sliding hernia are uncommon in children, more commonly seen in female babies. Grossfeld et al[6] had found ovaries and fallopian tubes in 15% of hernias in girls in one series.

Six patients (10%) of our series had presented with bilateral hernia, which were operated in same surgery. But, we did not perform routine contralateral exploration in absence of clinical inguinal hernia on the opposite side.

Post-operative period was uneventful in all of our cases, except for 3 patients (5%) who developed the complication of wound infection, which was successfully treated with antibiotics.

The follow-up period in our study ranged from 3 months to 1 year. No recurrence was reported during this period.

CONCLUSION

Inguinal hernia is a common cause of congenital inguino-scrotal swelling in pediatric age group. It is more commonly seen in male children and incidence is more common on right side. Though it can develop at any age, even in the neonates, but majority of children develop it between the age of 1 to 5 years. Incidence is higher in premature and low birth weight neonate. Almost all of the inguinal hernia in pediatric age group is of indirect type, which develops due to congenitally patent processus vaginalis. Once developed, it cannot resolve spontaneously, and so, early surgical intervention in form of inguinal herniotomy is the most appropriate management of inguinal hernia in children. Otherwise, it can lead to the complications like obstruction and strangulation.

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