



Evaluation of Clinico-Epidemiological Profile & Associated Risk Factors in Pediatric Inguinal Hernia

**Md. Zahangir Alam^{a++*}, Most. Fatema Khatun^{b#},
Md. Bani Amin^{c++} and Ashok Aryal^{d++}**

^a Department of Pediatric Surgery, ShSMC, Dhaka, Bangladesh.

^b Department of Pathology, Udayon Dental College, Rajshahi, Bangladesh.

^c Department of Surgical Oncology, BSMMU, Dhaka, Bangladesh.

^d Department of Otolaryngology, BSMMU, Dhaka, Bangladesh.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJMAH/2023/v21i7828

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/98027>

Original Research Article

Received: 05/02/2023

Accepted: 07/04/2023

Published: 15/04/2023

ABSTRACT

Among the most prevalent pediatric surgical issues are inguinal hernias and hydroceles. The causes of both the hernia and the hydrocele are the same. For this reason, most cases of inguinal hernia in children are indirect hernias caused by a patent processus vaginalis. Fluid accumulation in a sac like that of the scrotum may be the consequence of patent processus vaginalis or an abnormality in the secretion and absorption processes of the tunica vaginalis. Yet, despite the prevalence of inguinal hernias and hydroceles in children, there has been a paucity of research on these conditions in Bangladesh. In this study our main goal is to evaluate clinico-epidemiological

⁺⁺MS Resident;

[#]Assistant Professor;

^{*}Corresponding author;

profile & associated risk factors in pediatric inguinal hernia. The purpose of this research was to observe the frequency with which inguinal hernias and hydroceles occurred in children who were admitted to and treated at the Paediatric Surgery Department of Tertiary Hospital Dhaka between January 2020 and December 2021. Children of any age or gender who were diagnosed with inguinal hernia or hydrocele were included in the research. One hundred kids with inguinal hernia or hydrocele were hospitalised and had surgery over this time period. During the study, 60% were in 11-18 years age group, 55% were male and 35% were in middle income group. 55% children right sided inguinal hernia. 25% patient's mother had inguinal hernia followed by 21% patient's mother had connective tissue disorder 41% were preterm babies, 80% cases had right side hydrocele. Moreover, there was significant association were seen among preterm babies, times of presentation and hydrocele by side: with inguinal hernia occurrence in children. Plus 85% gone through open operation procedure and 24% patients had financial constraints. Also 20%,21% treated by homeopathic medicine and traditional healer respectively and 23% reluctant to treatment due to fear of surgery. Inguinal hernias and congenital hydroceles are two of the most common conditions that lead to the referral of children for paediatric surgical treatment. The majority of the hydroceles dissolve on their own over the course of time. As a consequence of this, a time period of vigilant waiting is warranted. It is suggested that surgery be performed as soon as possible after the diagnosis of an inguinal hernia in order to reduce the risk of any potential complications.

Keywords: Clinico-epidemiological; inguinal hernia; tunica vaginalis; herniotomy.

1. INTRODUCTION

In children, the inguinoscrotal area is the most common location for surgical procedures. While the region may be easily examined, a correct diagnosis requires little in the way of expertise. Inguinal hernia repairs are the most frequent procedure for a pediatric surgeon to undertake, according to studies [1,2,3]. Hydrocele occurs when fluid accumulates in the Processus Vaginalis (PV), causing a lump in the inguinal area or scrotum. An inguinal hernia occurs when a part of the abdomen protrudes through the inguinal canal or scrotum. Hydrocele and inguinal hernia may have similar causes and symptoms, and they can occur together [4]. Yet, estimates place the true prevalence of inguinal hernia in children between 1% and 5%. Inguinal hernia is more common in preterm infants (9-11%) than in fullterm infants [5]. Right-sided hernias are more common in both sexes, and the incidence rate is three to ten times higher in boys as compared to females [6]. Around 70% of inguinal hernias happen on the left side, whereas only 60% happen on the right. Bilateral hernias account for 10% of all cases. About 45-55% of preterm infants develop bilateral hernias. The incidence of inguinal hernia is highest in the first few months of a child's life, with a peak between the ages of 4 and 8. Whenever you hear the term "inguinal hernia" in reference to a kid, chances are you're thinking about an indirect inguinal hernia, however a femoral hernia or direct inguinal hernia are also possible. Patent processus vaginalis (PPV) is seen in 9 of 10

children with symptomatic indirect hernia. The side of the body opposite a clinically evident inguinal hernia has a much higher risk of PPV [7].

1.1 Objective

In this study our main goal is to evaluate clinico-epidemiological profile & associated risk factors in pediatric inguinal hernia.

2. METHODOLOGY

The purpose of this research was to observe the frequency with which inguinal hernias and hydroceles occurred in children who were admitted to and treated at the Paediatric Surgery Department of Tertiary Hospital Dhaka between January 2020 and December 2021. Children of any age or gender who were diagnosed with inguinal hernia or hydrocele were included in the research. One hundred kids with inguinal hernia or hydrocele were hospitalized and had surgery over this time period. All of these patients' ages, sexes, sides, types, etc. were documented. Information was gathered by a comprehensive history, careful physical examination, and appropriate procedures (such as ultrasound). Most instances of hydrocele heal on their own, so we didn't admit any kids who had it since we figured they'd be OK without us.

3. RESULTS

Table 1 shows demographic status of the patients where 60% were in 11-18 years age

group, 55% were male and 35% were in middle income group.

Table 1. Demographic status of the patients

Age distribution	Percentage (%)
3-10 years	40%
11-18 years	60%
Gender	Percentage (%)
Male	55%
Female	45%
Socio economic	Percentage (%)
Good	30%
Middle income	35%
Average	25%
Poor	25%

Fig. 1 shows Distribution of children with inguinal hernia by side where 55% children right sided inguinal hernia.

Table 2 shows clinical status of the patients where 25% patient's mother had inguinal hernia followed by 21% patient's mother had connective tissue disorder 41% were preterm babies 80% cases had right side of hydrocele. Moreover, there was significant association were seen among preterm babies times of presentation and hydrocele by side: with inguinal hernia occurrence in children.

Fig. 2 shows Distribution of children with hydrocele by time of operation where most of the patients had operation within 1-5 years.

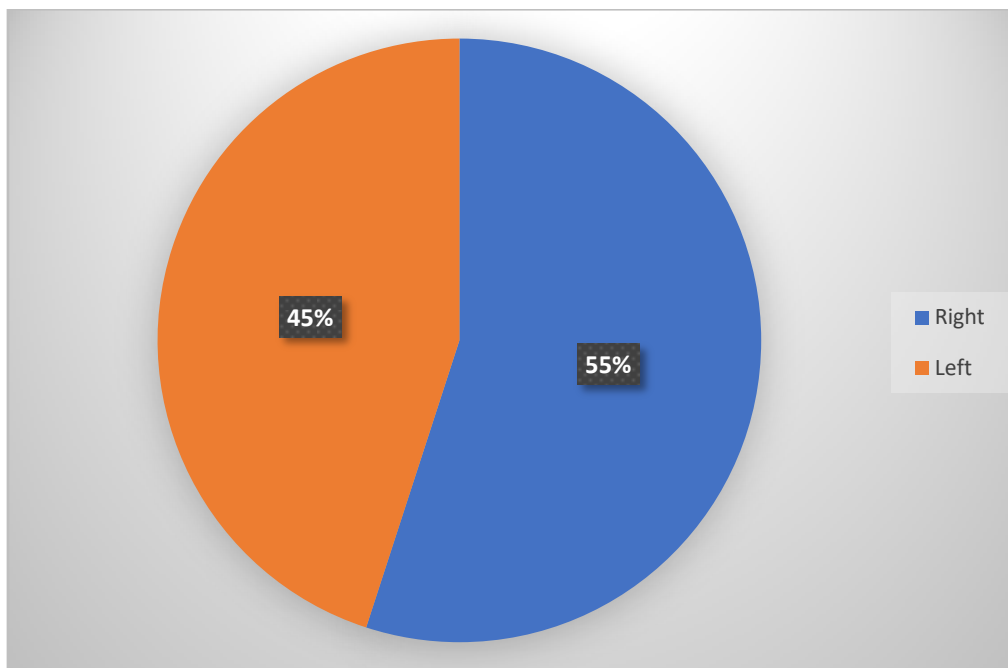


Fig. 1. Distribution of children with inguinal hernia

Table 2. Clinical status of the patients

Clinical status of the patients	Percentage (%)	P- value
Maternal inguinal hernia	25%	2.22
Maternal connective tissue disorder	21%	1.21
Preterm babies	41%	0.001
Time of presentation:		
Up to 6 months	10%	0.001
months- 5 year	60%	
>5 years	30%	
Children with hydrocele by side:		
Right	80%	0.001
Left	20%	

Fig. 3 shows operative procedure of the patients where 95% had gone through open procedure.

Table 3 shows Reasons for late presentation to health care center. 24% patients had financial constraints. 20%, 21% treated by homeopathic medicine and traditional healer respectively and 23% reluctant to treatment due to fear of surgery.

4. DISCUSSION

Among the most prevalent pediatric surgical issues are inguinal hernias and hydroceles. Males have a somewhat higher risk of hernia than females, at around 5%. A common misconception is that one is more likely to have an inguinal hernia if they are a certain race [2]. The real hereditary causes in hydroceles and indirect inguinal hernias are not yet understood. In youngsters, inguinal hernias are nearly often the result of an indirect PPV. A communicating hydrocele occurs when the PPV is very narrow and can only allow for the passage of fluid. Hernia is the medical term for a PPV that is too big and allows abdominal organs or tissue to protrude through it. Many clinical problems in infancy and youth, including inguinal hernia, hydrocele, and encysted hydrocele of the cord, are linked to incomplete obliteration of the processus vaginalis. Release of calcitonin gene-related peptide (CGRP) from the genitofemoral nerve in response to foetal androgen triggers and guides the descent of the testis. Nevertheless, the precise mechanism by which CGRP facilitates PPV closure is not well known. There is a strong correlation between undescended testis and PPV, which shows that closure often happens after the testis has descended [8]. Since patency of processus is so prevalent in androgen insensitivity syndromes, androgens seem to have a role in this condition [3].

In many cases, a doctor won't even need to do a full physical since the symptoms are so obvious on the patient's body. Eight, USG may be used in conjunction with a physical evaluation. Patients presenting with unilateral hernias might benefit from a preoperative examination of the contralateral PPV using this method [9]. In 9.1 percent of instances, PPV is discovered by chance during laparoscopy for another cause, and 10.5 percent of these infants go on to develop an inguinal hernia [10]. It seems that the frequency of contralateral PPV is lower than was previously thought 20. Androgen insensitivity syndrome (testicular feminization) may appear with bilateral inguinal hernias in a phenotypically

female patient [11]. Sliding hernias are rare, however they occur between 20% and 40% of the time in women. Cryptorchidism, abdominal wall anomalies, connective tissue diseases, mucopolysaccharidoses, cystic fibrosis, ascites, peritoneal dialysis, ventriculoperitoneal shunts, congenital hip dislocation, and myelomeningocele are all related with an elevated risk of inguinal hernia. Ninety to ninety five percent of all hydroceles will heal on their own during the first few months of life. Hydroceles are thus detectable even in children between the ages of one and three years. There is no natural cure for inguinal hernia [12,8,11]. Hernias may be repaired in one of two ways, the classic open procedure or the laparoscopic method [9], and the majority of surgeons now advise having the condition fixed as soon as possible following diagnosis [13].

The male to female participation ratio in this investigation was 5.15 to 1. As a result of the majority of parents' fear of undergoing surgery on their young infants and the fact that some of the parents sought the opinion of homeopathic physicians in the beginning, this research found that fewer children were operated on before the age of six months. During open surgery, the reported ipsilateral recurrence rate is less than 1%, whereas the rate ranges from 3.4% to 4.1% using the laparoscopic approach [4,8]. Throughout the course of this study's follow-up period of three months, there was no instance of a recurrence. After reaching one year of age, every kid diagnosed with congenital hydrocele had surgery, and all of them were boys [14]. The majority of inguinal hernias and hydroceles that occur in children are the result of an idiopathic inability of the processus vaginalis to close. Its closure may be slowed down or prevented entirely by any condition that raises the pressure inside the abdominal cavity. The prevalence of PPV drops down significantly as people become older.

As compared to adults, the percentage of newborns with a PPV ranges from 80-94% [4]. Even in the presence of PPV, the likelihood of a kid acquiring a hernia that causes symptoms throughout childhood is rather low [13]. If the repair is performed within one month of the diagnosis, about 90% of problems may be avoided. Since it has such a low likelihood of complications, open surgery is still performed in the majority of medical facilities [8]. In our investigation, we handled every case using an open methodology, some centers perform

laparoscopic methods also [9]. It is currently not suggested to do routine contralateral investigation [3]. We likewise carried out the procedure in the same manner. When the baby is no longer in the newborn stage, an inguinal hernia may be repaired with day surgery [15,16] For the purposes of this research, all patients were required to stay in the hospital since day

surgery is not often practiced in our nation. Except for the treatment of recurrent hernias in children who have connective tissue disorders or mucopolysaccharidoses, the use of mesh or prosthetic materials is practically never necessary in pediatric patients [8] Over the course of this research, not a single patient needed any mesh or prosthetic material.

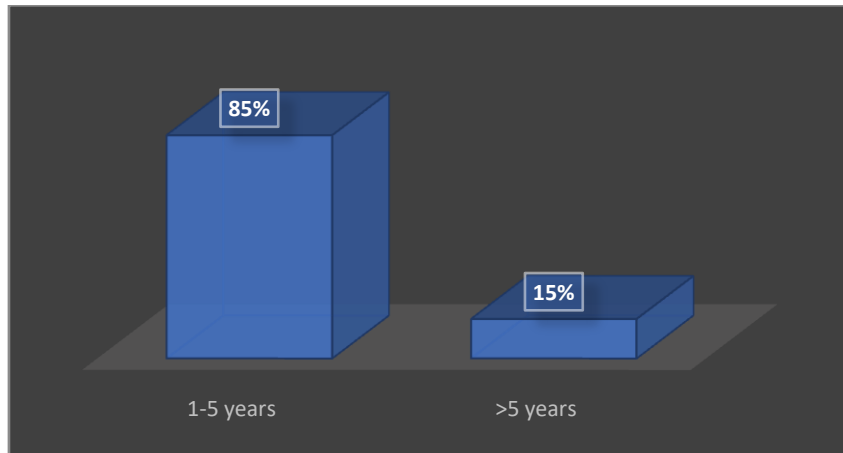


Fig. 2. Distribution of children with hydrocele by time of operation

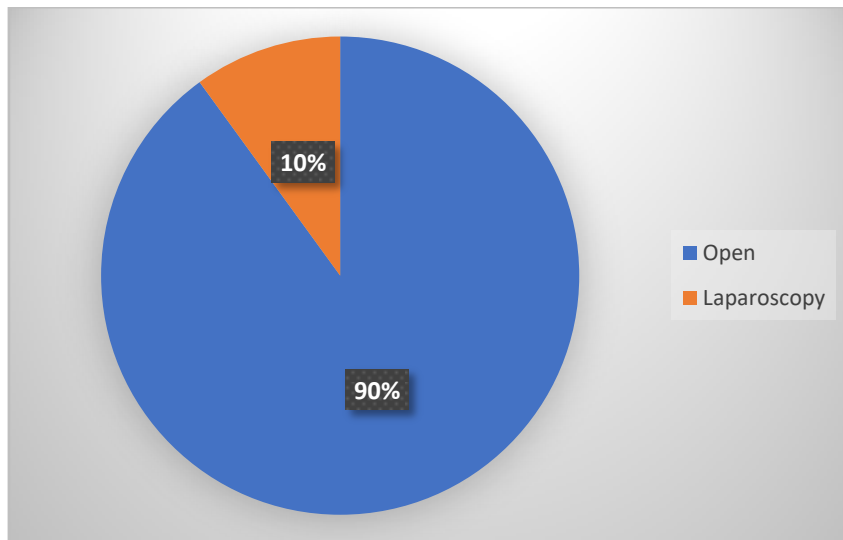


Fig. 3. Operative procedure of the patients

Table 3. Reasons for late presentation to health care center

Reasons for late presentation to health care center	Percentage (%)	P value
Financial constrains	24%	0.001
Lack of awareness of disease	34%	0.001
Fear of surgery	23%	0.001
Long distance from health care facilities		0.001
Treated by traditional healer	20%	0.001
Treated by homeopath medicine	21%	0.001
No reasons	5%	0.001

**Multiple responses were noted.*

5. CONCLUSION

Inguinal hernias and congenital hydroceles are two of the most common conditions that lead to the referral of children for paediatric surgical treatment. The majority of the hydroceles dissolve on their own over the course of time. As a consequence of this, a time period of vigilant waiting is warranted. It is suggested that surgery be performed as soon as possible after the diagnosis of an inguinal hernia in order to reduce the risk of any potential complications.

CONSENT

It is not applicable.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Acute Scrotum. In: Jones' Clinical Paediatric Surgery, 7th ed. UK: Willey Blackwell. 2015:175-182.
2. Kulshrestha R. Inguinoscrotal swellings. In: Kulshrestha R. Common problems in Pediatric Surgery, 2nd ed, India, CBS Publishers & Distributors. 2006:362-9.
3. Glick PL and Boulanger SC. Inguinal Hernias and Hydroceles. In: Coran AG, Adzick NS, Krummel TM, Laberge JM, Shamberger RC, Caldamone AA. ed, Pediatric surgery, 7th ed. USA: Saunders Company. 2012:985-1001.
4. Ortenberg J. Pediatric hydrocele and hernia surgery. Available: <https://emedicine.medscape.com/article/1015147-overview>
5. Hebra A. Pediatric hernias; 2017. Available: <https://emedicine.medscape.com/article/932680-overview#a6>
6. Lloyd DA. Inguinal and femora hernia. In: Ziegler MM, Azizkhan RG, Allmen DV, Weber TR. editors. Operative Pediatric Surgery, 2nd ed. USA: McGraw-Hill; 2014:543-54.
7. Rowe MI, Copelson LW, Clatworthy HW. The patent processus vaginalis and the inguinal hernia. J Pediatr Surg. 1969;4(1):102-7.
8. Snyder CL. Inguinal hernias and hydroceles. In: Holcomb GW, Murphy JP. editors. Ashcraft's Pediatric Surgery, 5th ed. USA: Saunders. 2010:667-75.
9. Zhu LL, Xu WJ, Liu JB, Huang X, Lv ZB. Comparison of laparoscopic hernia repair and open herniotomy in children: A retrospective cohort study. Hernia. 2017;21(3):417-23.
10. Tam YH, Wong YS, Pang KK, et al. Unexpected metachronous hernia development in children following laparoscopic unilateral hernia repair with negative evaluation for contralateral patent processus vaginalis. J Laparoendosc Adv Surg Tech A, JAFMC Bangladesh. 2013;23(3):287-90.
11. Lau WY. History of treatment of groin hernia. World J Surg 2002; 26:748-59.
12. Jona JZ. Inguinal hernia and hydrocele. In: Arensman RM, Bambini DA, Almond PS. editors, Pediatric Surgery, 1st ed. USA: Landes Bioscience. 2000:50-5.
13. Williams NS, Bulstrode CJK, O'Connell PR. Bailey and love's short practice of surgery. 26th ed. UK: CRS press. 2013:105-24.
14. Lugo-Vicente HL. Pediatric Surgery Hand book, 1st ed. San Juan, Puerto Rico 2002:22-5.
15. Grosfeld JL, Engum SA, and Tam PKH. Hernias in children. In: Spitz L, Coran AG, ed., Operative Pediatric Surgery, 7th ed. USA: CRC press. 2013:277-89.
16. Weaver KL, Poola AS, Gould JL, et al. The risk of developing a symptomatic inguinal hernia in children with an asymptomatic patent processus vaginalis. J Pediatr Surg. 2017;52(1):60-4.

© 2023 Alam et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/98027>