Original Research Article

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Surgical causes of abdominal pain in children: a retrospective study

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ABSTRACT

Background: Abdominal pain is a very prevalent problem in children and one of the common causes for visit to the hospital. They may be of acute or chronic presentation and depending on severity may also require admission to hospital.

Methods: This is a retrospective study conducted in our hospital over a period of 3 years. About 200 children who came to the hospital with abdominal pain and received treatment in surgical outpatient or referred to surgery department from emergency were included in this study and all relevant data were collected.

Results: The pain was found to be more in boys and in the age group of 9 to 12 years. The most common cause was found to be mesenteric adenitis followed by acute appendicitis. About 38% of children required surgical intervention on that admission due to various surgical causes.

Conclusions: The database of our retrospective study regarding age and sex incidence, clinicopathological features and therapeutic outcome was comparable to other studies in various literatures.

Keywords: Abdominal pain, Appendicitis, Mesenteric adenitis

INTRODUCTION

Abdominal pain is an important and common cause of hospital visit in paediatric patients. The anxiety of parents in most cases and the difficulty in obtaining history from children makes it difficult for the doctors to handle these patients. On an average about 5 to 10% of emergency department visit by children is attributable to abdominal pain. The presentation of abdominal pain can be acute or chronic. Among the acute causes some require urgent treatment while in others the treatment is nonurgent.

It is a triage of sorts which helps in differentiating a serious condition from a benign one. Among the various causes, studies show that about 20% were of surgical etiology.² Accurate diagnosis of cause of the pain is not possible with the assessment of the symptoms only because abdominal organs are devoid of pain sensation and the pain is usually a due to propagation of impulses

to another area or due to visceral pain receptors activation.^{3,4} The management requires blood counts and urine analysis and is often supplemented with the judicial use of diagnostic modalities like ultrasound, abdomen X ray and CT scan when warranted. The diagnosis of acute appendicitis by only clinical examination has a sensitivity of 75% and specificity of 78% which is not satisfactory in clinical settings.⁵ This article analyses the common causes of abdomen pain in children and the treatment initiated.

The aim of this study was to evaluate the various surgical causes of abdominal pain in children less than 15 yrs. We also evaluated the intervention given and the outcome.

METHODS

This was a retrospective study in the department of surgery in our hospital during a period of 3 years from January 2015 to October 2017 and the study included 200 cases. All children who attended surgical Outpatient department with abdominal pain and all surgical references from emergency department for pain abdomen in children were included into the study. All the children had undergone clinical examination followed by Xray abdomen and ultrasound. Those who did not have imaging done were excluded from the study to maintain uniformity.

Data regarding the age and sex of the child, investigations done, final diagnosis, intervention done and outcome were recorded and analysed.

RESULTS

The study showed predominance of boys over girls. About 56% were boys and 44% were girls. The age group of presentation was assessed, and it was found that maximum number of children presented in the age group of 10 to 12 years.

Table 1: Age distribution of children presented with abdominal pain.

Age range in years	Number of cases	Percentage
0-3	16	8
4-6	34	17
7-9	24	12
10-12	82	41
13-15	44	22

Apart from the clinical examination, X-ray and ultrasound done in all the patients included in the study, most of the patients (73%) had undergone basic blood and urine tests. The children managed as outpatient comprised the majority who were not investigated. The additional investigations done included CT scan in 15%, WIDAL in 30% of cases, urine culture and sensitivity in 22% of cases. Among the 200 children, about 142 (71%) were admitted for management as inpatient and others (29%) were managed as outpatient.

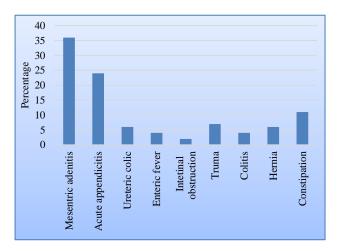


Figure 1: Surgical causes of abdominal pain.

The diagnosis analysed showed that the most common surgical cause of abdominal pain was mesenteric adenitis (36%) closely followed by acute appendicitis in 24% of cases.

On reviewing the OPD cards and case sheets on the children included in the study it was found that 36% of the children required surgical management immediately or in the same admission.

It included 24% who underwent appendicectomy, 6% who underwent hernia repair, 2% who had intestinal obstruction due to intussuception and 4% of those who presented due to trauma of the abdomen. The remaining children were managed conservatively without any adverse outcome.

Of the 200 patients, 186 patients were satisfied with the resolution of the pain while 14 patients came up for follow up with similar complaints.

DISCUSSION

Abdominal pain is a frequent problem encountered by clinicians in emergency department and is a standard referral to surgical department.

The causes can be medical or surgical in children with a very rare case of gynaecologic cause in girls. Most studies show medical cause predominating over surgical causes.^{6,7} The most common medical cause has been found to be gastroenteritis while appendicular inflammation predominates in the surgical aspect.⁸ In the study by Kim et al where all children with abdominal pain were included the most common cause was bacterial and viral gastroenteritis which was much greater that acute appendicitis and mesenteric adenitis put together (12.7%).⁹

In the study by Muhammad et al, male children were more (58.9%) compared to female children which is in concordance with present study. In the study by Caperell et al, female gender was predominant with 61% in African children and 52% in white children in contrast with male preponderance seen in Asian children as seen in our study and the other study. In the Muhammad et al study the mean age of the children was found to be 9.7 years while in our study the maximum number of patients 41% were in the age group of 10 to 12 years.

In the study by Erkan et al in Turkey only 32.8% had blood counts done, 25% had X ray and ultrasound of abdomen was performed only in 7.3% of cases.² In contrast in our study about 78% were investigated with routine blood and urine investigation.

Present study shows that about 15% of children presenting with abdominal pain had CT scan. Studies have shown that utilisation of CT scan in paediatric cases have increased over the years especially in admitted

children which correlates with our study.¹¹ But the study by Hryhorczuk shows that such liberal usage of CT was not done in specialised paediatric hospital when compared with hospitals that handle adults and paediatric cases.¹² Some studies have attempted to device scoring system for clinical diagnosis of appendicitis by using only neutrophil count over the clinical findings as an effort to reduce usage of imaging.¹³⁻¹⁵

The most common cause of abdominal pain in the Turkish study was upper respiratory infection (23.7%) while it was constipation in the study by Caperell et al. In our study also the most common cause was mesenteric adenitis which is common associated symptom in upper respiratory infections in children. In the study by Muhammad, the most common cause was acute appendicitis (40.4%).

In the study by Abantanga et al, the most common surgical cause of abdominal pain in Ghana was perforated typhoid ulcer which was attributed to the increased prevalence of enteric fever in Ghana which had poor hygienic living conditions. ¹⁶ In one study the among the children who were discharged without surgical intervention non specific abdominal pain was the most frequent discharge diagnosis. ¹⁷

The percentage of children requiring surgical intervention was 36% in our study while it was 20.7% in the study by Erkan et al. The mean of children with appendicitis in that study was 11.2 yrs while it was 10.7yrs in present study. It was found that diagnosis requiring surgical intervention such as appendicitis were much more common in older children than in younger children in the study by Caperell et al.¹

CONCLUSION

Abdominal pain is a common presentation in children and most of the times is self-limiting and mild. Inspite of clinicians' sincere effort, there are many chances that the cause of the pain cannot be identified in the first assessment. Still all efforts need to be made by clinicians as a team with radiologists and pathologists to reduce morbidity and mortality.

Studies have shown the usefulness of blood counts and CRP in conditions such as appendicitis and the benefit of a focussed surgeon performed ultrasonography in abdominal trauma cases. Analysis of the case sheets of emergency visit patients and formulating protocols for handling of children with abdominal pain will greatly help in making timely diagnosis and avoiding unnecessary admissions.

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Institutional Ethics Committee

REFERENCES

- 1. Caperell K, Pitetti R, Cross KP. Race and acute abdominal pain in a pediatric emergency department. Pediatrics. 2013;131(6):1098-106.
- 2. Erkan T, Çam H, Özkan HÇ, Kiray E, Erginoz E, Kutlu T et al. Clinical spectrum of acute abdominal pain in Turkish pediatric patients: a prospective study. Pediatr Int. 2004;46(3):325-9.
- 3. Comroe BI. Non-surgical causes of acute abdominal pain. Annal Surg. 1935;101(1):438-44.
- 4. Ross A, LeLeiko NS. Acute abdominal pain. Pediatr Rev. 2010;31:135-44.
- 5. Bundy DG, Byerley JS, Liles EA, Perrin EM, Katznelson J, Rice HE. Does this child have appendicitis? JAMA. 2007 Jul;298(4):438-51.
- 6. Leung AKC, Sigalet DL. Acute abdominal pain in children. Am Fam Physician. 2003;67:2321-6.
- Shakya KN, Dongol UM, Khadka SB. A study of abdominal pain in children. JNMA. 2008 Oct-Dec;47(172):193-6.
- 8. Lin CH, Chen JH, Li TC, Ho YJ, Lin WC. Children presenting at the emergency department with right lower quadrant pain. Kaohsiung J Med Sci. 2009;25:1-9.
- 9. Kim JH, Kang HS, Han KH, Kim SH, Shin KS, Lee MSet al. Systemic classification for a new diagnostic approach to acute abdominal pain in children. Pediatr Gastroenterol, Hepatol Nutri. 2014;17(4):223-31.
- 10. Sheikh MA, Latif T. Acute abdominal pain in children; clinical outcomes and value of symptoms and signs in diagnosis. Professional Med J. 2015;22(8):1080-6.
- 11. Fahimi J, Herring A, Harries A, Gonzales R, Alter H. Computed tomography use among children presenting to emergency departments with abdominal pain. Pediatrics. 2012;130(5).
- 12. Hryhorczuk AL, Mannix RC, Taylor GA. Pediatric abdominal pain: use of imaging in the emergency department in the United States from 1999 to 2007. Radiology. 2012 Jun;263(3):778-85.
- 13. Schneider C, Kharbanda A, Bachur R. Evaluating appendicitis scoring systems using a prospective pediatric cohort. Ann Emerg Med. 2007 Jun;49(6):778-84.
- 14. Bhatt M, Joseph L, Ducharme FM, Dougherty G, McGillivray D. Prospective validation of the pediatric appendicitis score in a Canadian pediatric emergency department. Acad Emerg Med. 2009 Jul;16(7):591-6.
- 15. Kharbanda AB, Monuteaux MC, Bachur RG, Dudley NC, Bajaj L, Stevenson MD et al. A Clinical Score to Predict Appendicitis in Older Male Children. Academic Pediatr. 2017;17(3):261-6.
- 16. Abantanga FA, Nimako B, Amoah M. The range of abdominal surgical emergencies in children older than 1 year at the Komfo Anokye teaching hospital, Kumasi, Ghana. Ann Afr Med. 2009;8:236-42.

- 17. Holland A, Gollow IJ. Acute abdominal pain in children: an analysis of admissions over a three year period. J Qual Clin Pract. 1996;16:151-5.
- 18. Scholer SJ, Pituch K, Orr DP, Dittus RS. Clinical outcomes of children with acute abdominal pain. Pediatrics. 1996;98:680-5.
- 19. Kwan KY, Nager AL. Diagnosing pediatric appendicitis: usefulness of laboratory markers. Am J Emerg Med. 2010;28:1009-101.
- 20. Soundappan SV, Holland AJ, Cass DT, Lam A. Diagnostic accuracy of surgeon-performed focused abdominal sonography (FAST) in blunt paediatric trauma. Injury. 2005;36:970-5.

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