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Original Research Article

Paediatric Acute Abdomen: Clinical Patterns and Age-Wise Distribution

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Abstract:

Background: Acute abdomen in children represents a frequent and diagnostically challenging clinical problem, marked by sudden severe abdominal pain requiring urgent evaluation. The causes in pediatric patients are highly variable and age-dependent, ranging from benign, self-limiting conditions to life-threatening surgical emergencies. Rapid identification and appropriate management are critical to minimize morbidity and mortality.

Objectives: This study aimed to analyse the clinical presentation and age-wise distribution of causes of acute abdomen in children presenting to a tertiary care centre, emphasizing the patterns of pain localization and their correlation with underlying etiologies.

Methods: A descriptive, observational study was conducted at a tertiary care centre involving 104 consecutive paediatric patients aged 1–14 years presenting with acute abdominal pain. Comprehensive demographic data, clinical symptoms, pain location, laboratory investigations, and imaging findings were recorded and analysed. Patients were divided into three age groups: 1–5 years, 6–10 years, and 11–14 years.

Results: Of 104 children enrolled, 59% were males and 41% females, with a progressive increase in cases in older age groups. Periumbilical pain was most frequent in the youngest group (43.3%), while epigastric and right iliac fossa pain became more prominent in older children (27.9% and 25.6% respectively in 11–14 years). Generalized abdominal pain was least common in all groups. The trend in pain localization with increasing age correlated with a shift from nonspecific/infective etiologies (such as gastroenteritis and mesenteric lymphadenitis) in younger children to acid peptic disease and appendicitis in adolescents.

Discussion: The findings highlight a clear age-dependent variation in the presentation of paediatric acute abdomen. Recognizing these clinical patterns enhances diagnostic precision, facilitates targeted investigations, and supports early intervention for surgical causes such as appendicitis, while reducing overtreatment of benign or functional conditions.

Keywords: Paediatric, Acute abdomen, Age distribution, Pain localization.

Introduction

Acute abdomen in children is a frequently encountered and complex clinical problem characterized by sudden, severe abdominal pain requiring urgent evaluation. The causes range widely in severity from benign, self-limiting conditions to potentially life-threatening surgical emergencies. Diagnosing the cause in paediatric patients is particularly challenging because younger children often cannot clearly articulate their symptoms, and early clinical signs may be nonspecific. Rapid and accurate assessment is crucial to prevent delays that can increase morbidity and mortality, especially in surgical cases. [1]

The etiology of acute abdomen varies considerably with age. In infants and toddlers, structural and mechanical causes such as intussusception and congenital malformations are common. Across all ages, infectious causes like viral gastroenteritis frequently present with abdominal pain, while in older children and adolescents, appendicitis emerges as the predominant surgical cause. Other differential diagnoses include mesenteric lymphadenitis, acid peptic disease, urinary tract infections, and functional abdominal pain disorders, each with differing age-related prevalence. [2,3,4]

Globally, acute abdominal pain represents one of the leading reasons for paediatric emergency visits and hospital admissions. The pattern of causative diseases may vary regionally, influenced by factors such as infection rates, healthcare infrastructure, and population demographics. Accurate differentiation between surgical and nonsurgical causes remains a key clinical challenge to optimize patient outcomes while avoiding unnecessary procedures. [5,6] A

thorough clinical evaluation, including pain localization, associated symptoms, physical examination, and targeted investigations such as laboratory tests and imaging, is essential. Understanding the typical clinical presentations and how they evolve with age can guide clinicians in making timely and accurate diagnoses. [7,8] Despite the prevalence of paediatric acute abdomen, there remains a need for detailed age-stratified data on clinical patterns and pain distribution to assist frontline clinicians. This study aims to fill that gap by documenting the clinical profiles and age-wise distribution of acute abdomen cases presenting to a tertiary care centre. The goal is to improve diagnostic accuracy, augment clinical decision-making, and facilitate appropriate management tailored to paediatric age groups. [9]

Results

A total of 104 children presenting with acute abdominal pain were included in the present study. Of these, 61 (59%) were males and 43 (41%) were females, reflecting a male preponderance (Figure 1).

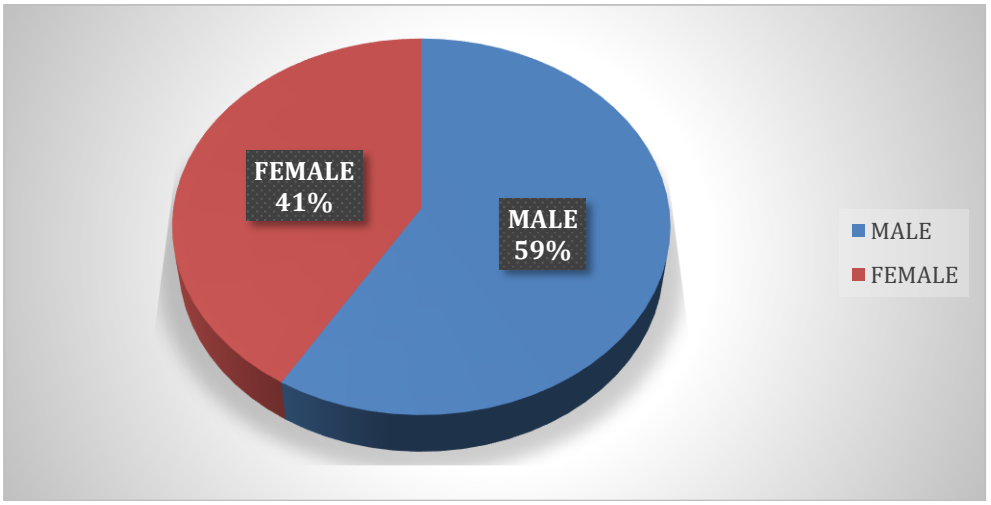

Figure 1: Gender distribution in acute abdomen

When analysed according to age, the study population was divided into three groups: 1--5 years (n=30), 6--10 years (n=31), and 11--14 years (n=43). The distribution across the age categories showed a progressive rise in frequency with increasing age, the highest number of cases being recorded in the 11--14 years group. Males outnumbered females in all age categories. In the 1--5 years group, there were 17 boys and 13 girls; in the 6--10 years group, 18 boys and 13 girls; and in the 11--14 years group, 25 boys and 18 girls (Figure 2). Thus, although the overall male predominance persisted across all groups, the relative difference narrowed with advancing age. [10]

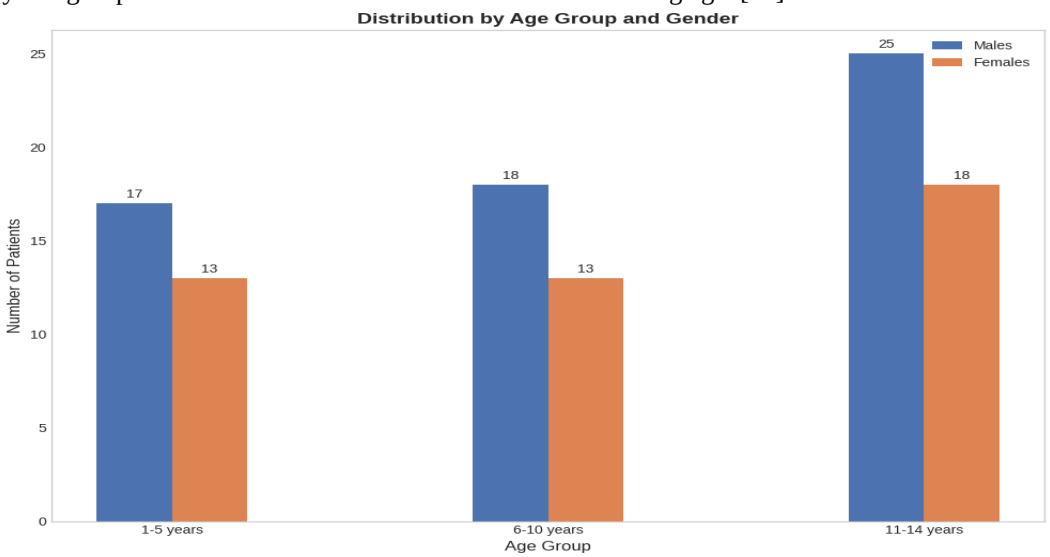

Figure 2: Distribution by Age Group and Gender

The pattern of pain location exhibited a characteristic variation with age (Figure 3). In the 1--5 years age group (n=30), periumbilical pain was the most frequent presentation (43.3%), followed by right iliac fossa pain (30%), which is often suggestive of appendicular pathology. Epigastric pain was seen in 16.7%, whereas generalized pain was the least common (10%). [11,12]

In the 6--10 years group (n=31), the trend remained similar, with periumbilical pain again accounting for the majority (41.9%). Epigastric pain (22.6%) became slightly more prominent compared to the younger group, while right iliac fossa pain (19.4%) and generalized pain (16.1%) were noted in smaller but significant proportions. Among the 11--14 years group (n=43), a shift in pain pattern was observed.

Here, epigastric pain (27.9%) and periumbilical pain (27.9%) were equally common, representing the leading presentations. Right iliac fossa pain (25.6%) was also increasingly reported in this age group, aligning with the higher prevalence of appendicitis and related conditions in older children. Generalized abdominal pain (18.6%) constituted the least frequent but nonetheless notable presentation. [13,14]

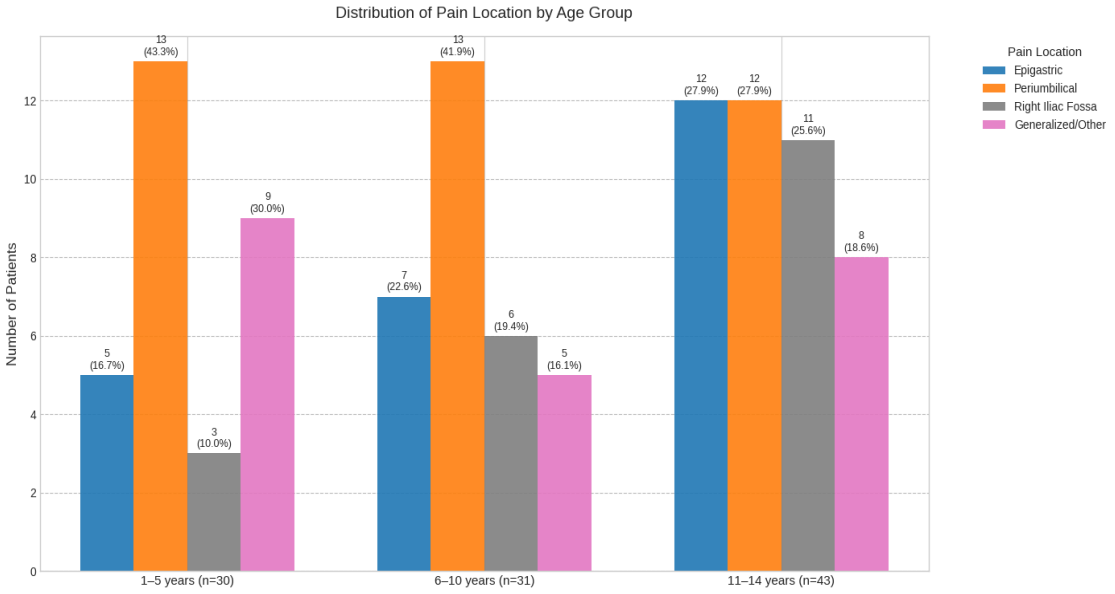

Figure 3: Distribution of Pain Location by Age Group

Overall, the analysis of the entire cohort highlights that periumbilical pain was the single most common site of abdominal pain, particularly in younger children. However, as age advanced, epigastric and right iliac fossa pain gained prominence, suggesting a changing spectrum of underlying etiologies with age progression. Generalized pain remained the least common mode of presentation across all groups. [15]

The above findings emphasize that while periumbilical pain dominates the clinical profile in early childhood, older children present with a more heterogeneous distribution, with increasing recognition of epigastric and right iliac fossa pain, the latter being of particular clinical importance as it often raises the suspicion of acute appendicitis. [16]

Discussion

The present study provides an overview of the clinical presentation of acute abdominal pain in children, with emphasis on age-wise distribution and pain localization. A male predominance was observed across all groups, though the difference between sexes narrowed in adolescence. The increasing number of cases in the 11--14 years age group suggests that older children are more frequently affected by conditions requiring evaluation for acute abdomen. [10]

Pain location analysis revealed distinct age-related patterns that can be correlated with common paediatric abdominal diseases. In the 1--5 years group, periumbilical pain was the predominant symptom. This pattern is often associated with gastroenteritis, mesenteric lymphadenitis, and functional abdominal pain, all of which are frequent in this age group. Right iliac fossa pain, the second most common site, indicates that appendicitis should also be considered in early childhood, despite its lower overall incidence in this age bracket. Generalized pain, though less common, likely reflected diffuse gastrointestinal infections or systemic illnesses. [17] In the 6--10 years group, periumbilical pain remained the leading presentation, but epigastric pain showed a notable rise. This finding points toward an increasing burden of acid peptic disorders and gastritis in this age range, in addition to nonspecific abdominal pain.

Right iliac fossa pain was still significant, corresponding to appendicular pathology beginning to appear more frequently in this group. Generalized pain in this group could represent early or atypical presentations of gastroenteritis, urinary tract infections, or inflammatory conditions. [18]

In the 11--14 years group, the distribution shifted further. Epigastric and periumbilical pain were equally common, with right iliac fossa pain emerging as a major complaint. The rise in epigastric pain at this age is consistent with the higher incidence of acid peptic disease and gastritis in adolescents, while the increased frequency of right iliac fossa pain corresponds to appendicitis becoming the most important surgical cause of acute abdomen. Generalized abdominal pain, although least frequent, may indicate conditions such as pancreatitis, diabetic ketoacidosis, or peritonitis, which tend to present in this age group with more severe systemic features. [19]

Overall, these findings suggest a dynamic shift in the spectrum of disease with age. Periumbilical pain dominates in early childhood, reflecting nonspecific or infective etiologies. Epigastric pain gains importance in older children, suggesting acid peptic-related disease. Right iliac fossa pain increases steadily with age, strongly pointing towards appendicitis in adolescents. Generalized pain, though less common, remains clinically significant due to its association with systemic or severe abdominal pathology.

By linking pain location with likely disease profiles, this study underlines the value of age-specific clinical interpretation in paediatric acute abdomen. Careful attention to pain localization not only aids in narrowing the differential diagnosis but also helps in prioritizing conditions that require urgent intervention, such as appendicitis, while avoiding unnecessary over-treatment in benign or functional conditions. [20]

Conclusion

The present study demonstrates that acute abdomen in children exhibits marked age-dependent clinical patterns, particularly in pain localization and underlying etiologies. Among 104 paediatric patients, a male predominance was noted across all age groups, though the gap narrows in adolescence.

The majority of cases were observed in the 11–14 years age group, signifying greater susceptibility of older children to acute abdominal conditions. Pain location analysis revealed distinctive trends: periumbilical pain was most prevalent among younger children (1–5 years), typically corresponding to nonspecific or infective causes such as gastroenteritis and mesenteric lymphadenitis. As age increased, there was a clear shift—epigastric pain and right iliac fossa pain became increasingly common, particularly in adolescents, aligning with a higher incidence of acid peptic disease and acute appendicitis, respectively. Generalized pain, while the least common presentation in all age groups, remained clinically significant and associated with systemic or severe abdominal pathology.

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