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Original Research

An Epidemiological Investigation into the Etiology and Management of Abdominal Pain

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ABSTRACT:

Background: Abdominal discomfort in children is a frequent childhood issue. This condition is associated with various factors and causes. The primary objective of our study was to investigate the prevalence, origins, and therapeutic approaches for children experiencing stomach discomfort. **Methods:** During the course of a year, a total of 360 children sought medical care at the pediatric outpatient department. Out of this group, 50 children met the specified inclusion criteria and were all included in the study. The study focused on three distinct age groups: preschoolers (3-5 years old), school-age children (6-10 years old), and young adolescents (11-13 years old). **Results:** Abdominal discomfort was found to affect 12.8 percent of the children who visited the pediatric outpatient department. The largest portion of participants, comprising 53 percent of the total, fell within the 11-13 age range. Among the 50 subjects, 56 percent were females, while 44 percent were males. The study population was predominantly rural, with 77 percent residing in rural areas and 23 percent in urban settings. The most common etiologies for abdominal discomfort were Functional Gastrointestinal Disorders (36 percent), Gastritis (19 percent), and Worm Infestations (16 percent). **Conclusion:** In summary, abdominal pain is a common concern in pediatric outpatient departments, necessitating a thorough exploration of various potential causes, particularly those demanding prompt intervention to mitigate morbidity and mortality risks. In the context of evolving scientific and technological advancements, ensuring the safe and efficient delivery of pediatric surgical care to children has never been more crucial. Consistent pharmaceutical care services play a vital role in enhancing the overall quality of life for children.

Keywords: Abdominal pain, acute abdomen, chronic abdomen, epidemiology, etiology.

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INTRODUCTION

Chronic stomach pain is a prevalent issue among children, with prevalence rates ranging from 0.3 to 19 percent among school-aged children¹. Strikingly, more than 90 percent of these cases lack a discernible biological explanation. Abdominal pain is a frequent complaint in pediatric practice, manifesting with regularity. Abdominal pain-related functional gastrointestinal disorders (AP-FGIDs) encompass conditions such as functional dyspepsia (FD), irritable bowel syndrome (IBS), abdominal migraine (AM), functional abdominal pain (FAP), and functional abdominal pain syndrome (FAPS). Children affected by AP-FGIDs typically report significantly lower quality of life (QoL) scores in comparison to their healthy peers, and AP-FGIDs stand as the second

leading cause of school absenteeism². Despite ongoing medical interventions, a substantial 29.1 percent of patients grappling with chronic abdominal discomfort continue to endure pain that persists for over five years. While the majority of cases are benign, abrupt and acute abdominal pain can be an indicator of intra-abdominal pathology, sometimes necessitating surgical intervention³. Given the inherent difficulty in establishing a definitive diagnosis, especially in pediatric emergency settings, abdominal pain is a source of anxiety for both children and their families, as well as healthcare providers. Swift identification of clear etiologies is imperative to prevent serious morbidity or mortality in children.

MATERIALS AND METHODS

During the course of one year, a total of 360 children sought medical attention at the department. Out of this group, 50 children met the specified inclusion criteria and were all enrolled in a prospective observational study⁴. The study involved the use of the Patient Preformed tool to collect essential information from both the patients and their parents or representatives. The collected data were analyzed using relevant questionnaires and scales to estimate the prevalence of stomach discomfort in children⁵. Prior to commencing the study, it received approval from the institutional ethical committee, and documented informed consent was obtained from the participants. The study included children aged 3 to 13 who had visited a doctor due to severe stomach pains, as indicated by a score of 4 on Bieri's revised face self-evaluation scale, specifically validated for use in children during the initial assessment. Chronic abdominal pain was defined as a recurring series of painful episodes lasting at least three months and not preceded by acute events. Parental informed consent was secured in advance. The children underwent a comprehensive clinical examination, along with various laboratory tests. Parameters such as age, gender, the time elapsed between symptom onset and the medical consultation, accompanying signs, geographical factors, and defense signals were all carefully evaluated. Additional tests included a complete blood count (CBC), C-reactive protein (CRP) assessment, abdominal ultrasound, abdominal X-ray, and stool analysis. In specific cases, further tests like a thick smear, chest X-ray, and mid-stream urine sample were recommended, particularly in cases involving fever. Gastrosocopy was suggested in instances of discomfort localized in the epigastric region, and stool culture was advised for cases of diarrhea accompanied by fever or a general decline in health. The study also scrutinized the duration between the medical consultation and the final diagnosis, as well as the methods employed for pain management. To establish the etiology of the pathology, certain criteria were employed⁶. A viral origin was considered when there was leukocytosis exceeding 10,000/mm³, mainly characterized by lymphocytes, along with the absence of bacterial growth in culture or a positive result in a viral detection test. On the other hand, a bacterial etiology was determined if the leukocytosis exceeded 10,000/mm³, with a predominance of neutrophils, and/or when a bacterial culture yielded positive results.

RESULTS

In the study, a total of 50 children were included out of the 360 who visited during the research period, indicating a prevalence of 12.8 percent for children experiencing stomach discomfort (aged 3-13 years). The participants were categorized into three age groups: preschool, school-aged, and young adolescents. Specifically, there were 6 children enrolled in the preschool group, 53 in the school-aged category, and 26 in the 11-13-year-old young adolescent group. Among the 50 participants, approximately 56 percent identified as females, while 44 percent identified as males. This indicates a higher prevalence of stomach pain among females compared to males.

The reported prevalence of stomach discomfort varies significantly between rural and urban areas. In this study, approximately 77 percent of the participants reside in rural areas, while the remaining 23 percent live in urban environments. It's well-established that an individual's socioeconomic status (SES) has a substantial influence on their overall health and access to healthcare services. Individuals with a lower SES are more prone to report poorer self-perceived health, shorter life expectancy, and a higher incidence of chronic diseases compared to those with a higher SES. While both urban and rural communities face various stressors, economic challenges have had a more pronounced impact on rural regions in India. To provide a breakdown, there were seven children from the upper-class, thirty-one from the lower-middle class, fourteen from the upper-middle class, and forty-eight from the upper-middle class. In this context, it's noteworthy that the upper-middle-class group accounted for 48 percent of the 50 children studied, outnumbering the lower-middle class by 24 children. Functional Gastrointestinal Disorders (FGID) were the most frequent cause of abdominal pain, accounting for 36 percent of cases. Gastritis followed, contributing to 19 percent of the cases, while Worm Infestations were responsible for 16 percent. Other causes included Urinary Tract Infections (UTI) at 7 percent, Appendicitis at 6 percent, Enteric fever at 4 percent, Gastroenteritis at 4 percent, Dengue fever at 3 percent, Mesenteric lymphadenopathy at 2 percent, and individual cases of Inguinal Hernia, Hydronephrosis, and Intussusception, each accounting for 1 child.

Among the children, the most common type of pain reported was a diffuse dull ache, experienced by 56 percent of them. This was followed by pricking-type and scorching-type pain, each reported by 13 percent of the children, and throbbing-type and squeezing-type pain, each experienced by 9 children.

Table 1: No. of people with stomach discomfort:

Age Group	Number
Preschool (3-5 years)	6
School-Aged (6-10 years)	53
Young Adolescents (11-13 years)	26

Figure 1: Gender distribution

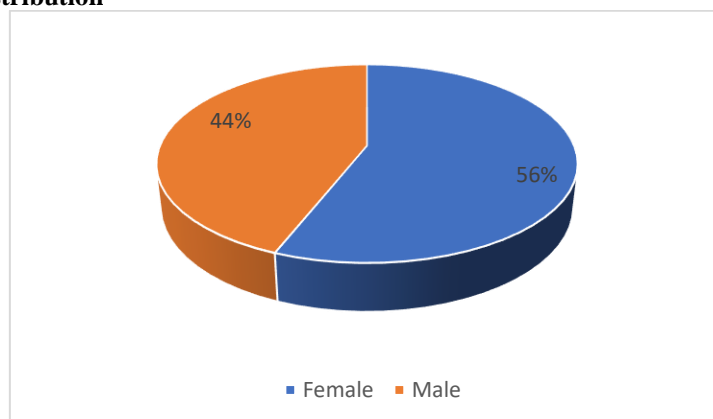


Fig 2: Distribution of etiologies according to class

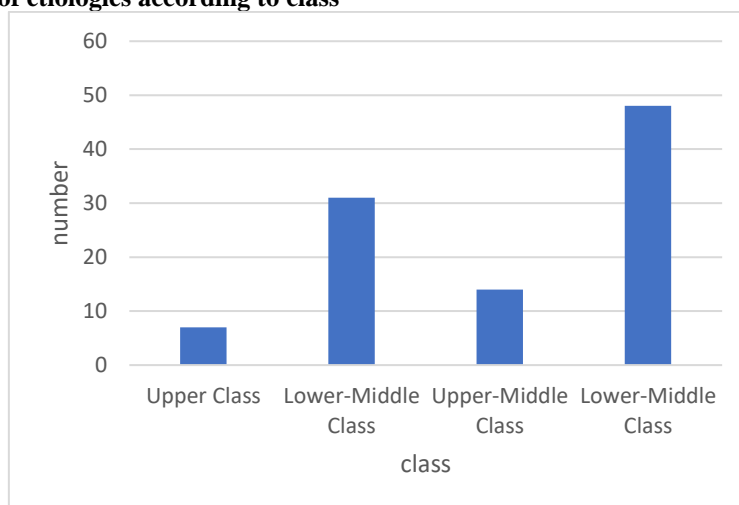


Table 2: Causes of abdominal pain and their respective percentages

Cause of Abdominal Pain	Percentage
Functional Gastrointestinal Disorders	36%
Gastritis	19%
Worm Infestations	16%
Urinary Tract Infections (UTI)	7%
Appendicitis	6%
Enteric fever	4%
Gastroenteritis	4%
Dengue fever	3%
Mesenteric lymphadenopathy	2%
Inguinal Hernia	1%
Hydronephrosis	1%
Intussusception	1%

DISCUSSION

Abdominal discomfort ranks as a frequent cause of visits to hospitals. In the context of Africa, studies focusing on the epidemiology of such conditions in children are quite rare. The precise occurrence of stomach discomfort remains elusive, with our research revealing a consultation prevalence of 7.2 percent. In the year 2014, abdominal discomfort emerged as the foremost uncomfortable symptom experienced by preschool and primary school children in Switzerland. It held a prominent position, surpassing even

headaches in terms of prevalence⁷. Specifically, 6% of kindergarten children and 10% of those in primary schools reported experiencing abdominal discomfort. This data shed light on the widespread nature of this issue among young children in the Swiss educational system. Across the Atlantic in Iowa, a distinct but similar trend was observed in 2007, where 9% of the 962 children, ranging in age from 4 to 17, sought medical attention for acute abdominal discomfort. This statistic underlined the significance of this health concern among children of various age groups in

different regions. It is noteworthy to mention the Loening-survey conducted by Baucke in the United States, which involved a cohort of children with a mean age of 9.1 years. The slightly higher mean age in this study was a result of the deliberate exclusion of children under the age of four. This exclusion aimed to ensure that children could provide reliable self-reports of their pain, consequently enhancing the reliability and validity of the self-assessment data. Interestingly, despite the variations in age and geographical location, no significant gender-based differences were identified in the prevalence of abdominal discomfort, possibly due to the relatively limited size of the sample.

Abdominal pain is a multifaceted challenge, primarily due to its association with a multitude of potential underlying conditions. This complexity makes it a daunting task to establish a definitive etiological diagnosis. These underlying conditions can broadly be categorized into three main groups: intra-abdominal, extra-abdominal, and psychogenic factors. While abdominal discomfort is generally considered a benign symptom, there are instances where it can escalate into more severe issues, necessitating prompt diagnosis and appropriate treatment. To achieve an accurate diagnosis, a comprehensive medical inquiry, a meticulously conducted clinical examination, or even basic supplementary tests such as abdominal X-rays or abdominal ultrasound scans can be instrumental in identifying the root causes of abdominal discomfort in children. This comprehensive approach is crucial in providing the appropriate medical care and management needed for each individual case, ensuring the best possible outcomes for young patients⁸. The literature extensively details the multitude of factors that can lead to acute abdominal discomfort. However, diagnosing this group of patients can pose a considerable challenge due to the potential surgical implications. In our research, we found that 6.6% of our patients exhibited surgical pathology as the underlying cause of their abdominal discomfort. In comparison, the percentage of cases attributed to surgical reasons in Iowa was notably lower at 4%.

Taking a closer look at Serengbe's findings, it was revealed that 30.4% of individuals seeking medical attention for abdominal discomfort were diagnosed with appendicitis, while 4.6% had a strangulated hernia, and 1.4% suffered from occlusion syndrome⁹. In our own analysis, appendicitis emerged as the dominant surgical cause, accounting for more than half of the cases presenting with surgical pathology. This highlights the significant prevalence of appendicitis as a root cause of abdominal discomfort, with a substantial 20.6% of individuals requiring hospitalization for this condition. The implications of these findings underscore the importance of considering surgical causes when diagnosing acute abdominal discomfort, particularly given the substantial impact of appendicitis as a leading

contributor to this health concern. Proper and timely diagnosis is crucial to ensure the appropriate management and intervention for patients experiencing these conditions, minimizing the risks associated with surgical issues. In our research, the diagnosis of appendicitis typically occurred 24 hours after the initial consultation. Despite the availability of advanced medical technology, arriving at a definitive diagnosis of appendicitis remains challenging in our setting due to the diverse clinical presentations and characteristics of this condition. This diagnostic challenge often leads to delays in making decisions regarding surgical interventions.

Interestingly, our study identified infectious pathologies as the primary culprits behind abdominal pain¹⁰. Within this category, bacterial pathologies, with pyelonephritis being the most prominent, were a significant contributor. This pattern was reflected in the high incidence of fever as the most frequently observed associated symptom. In the Bangui region, urinary infections accounted for 3.4% of cases, emphasizing their prevalence. In contrast, in Iowa, chronic and acute constipation emerged as the most common causes of acute abdominal pain in children. It's worth noting that urinary tract infections stand out as one of the most recurrent bacterial infections in pediatrics, second only to acute otitis media. Pyelonephritis, a complicated form of urinary tract infection, was found to potentially cause renal parenchymal lesions in 40% to 60% of affected children¹¹. Additionally, for roughly half of these cases, it resulted in renal scarring, a condition associated with elevated blood pressure, microalbuminuria, proteinuria, and chronic renal failure. Both clinical and experimental data indicate that a delay in initiating appropriate treatment significantly amplifies the risk of developing renal scarring, underscoring the importance of early intervention in cases of pyelonephritis. The 94-hour delay we observed in our results is undeniably quite lengthy, signifying a notable delay in making critical medical decisions. Notably, in this polyclinic, the practice of utilizing urinary strips during consultations is not a common procedure among physicians. However, it is worth mentioning that medical practitioners here are cognizant of the diagnostic significance of a reactive strip¹². This acknowledgment is primarily based on the positive predictive value associated with the presence of "leukocytes and positive nitrites," which stands at 70%. Furthermore, the negative predictive value for these indicators is close to 100% in the case of children. This underscores the effectiveness of urinary strips as a diagnostic tool, even though they might not be routinely employed. Our study also revealed that pneumonia and pleuropneumonia represented the second most common bacterial pathologies among our observations. The non-specific nature of pneumonia symptoms, particularly in infants and young children, can account for this finding¹³. It's often challenging to

distinguish the symptoms of pneumonia from other ailments, making accurate diagnosis and timely treatment essential. Bacterial pathologies were succeeded by parasitic pathologies, with malaria emerging as the most frequently observed condition, accounting for 82.8% of cases. Notably, the incidence of malaria was higher in our study, affecting 22.5% of the children with abdominal pain. Fever, a hallmark symptom of malaria in endemic regions, underscores the importance of considering this condition, even though it lacks specific characteristics. Furthermore, our study mirrored a comparable pattern of etiologies, with functional issues being the most prevalent, followed by gastritis and various infections. Notably, infections such as acute gastroenteritis, enteric fever, worm infestations, and urinary tract infections are known to be more common in populations with lower economic status, which may have contributed to their high incidence in our findings. This emphasizes the need for targeted healthcare interventions in such areas to address these prevalent health issues.

CONCLUSION

Abdominal pain is a frequent concern in pediatric medical practice, presenting a diverse range of potential causes that often pose a diagnostic challenge during consultations. The nature of abdominal pain, whether acute or chronic, its location, and accompanying symptoms, can facilitate the diagnosis in most cases. Among the most commonly encountered etiologies, functional abdominal pain, worm infestations, and gastritis stand out. The accurate and timely determination of the underlying cause of abdominal pain is essential for effective management. It's reassuring to note that many of these cases achieve complete remission with minimal to no long-term effects or sequelae when addressed appropriately. However, the need for further systematic studies to assess symptoms is evident. These studies, ideally utilizing a systematic methodology, can provide the necessary evidence to establish vital guidelines and resources for informed decision-making and support in the field of pediatric abdominal pain. While it's true that many of these etiologies are benign in nature, it's crucial to emphasize that appropriate care is the linchpin in reducing the potential morbid consequences that can sometimes be observed. Achieving this goal necessitates a systematic and comprehensive approach to address the intricacies of abdominal pain and ensure the best possible outcomes for young patients.

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