Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/b9mg4143

ETIOLOGICAL SPECTRUM OF ACUTE ABDOMEN AMONG PATIENTS PRESENTING TO SURGICAL EMERGENCY IN TERTIARY CARE HOSPITAL, LAHORE

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Abstract

Objective: To assess the pattern of most common surgical pathologies in acute abdomen in adult population between ages 18 to 80 years.

Study Design: Cross sectional nonconsecutive nonrandom observational study analytical study conducted over a period of One year from 1st January 2024 till 31st December 2024.

Place and Duration: Patients landing in the emergency room of Chaudhry Akram Teaching Hospital with acute abdomen which were dealt with by the surgical emergency were included in the study and detailed record taken. Study was conducted over a One year from 1st January 2024 till 31st December 2024.

Result: A total of 194(n) patients were included in the study with female dominance by a small factor. In descending order of occurrence, the provisional diagnoses were acute appendicitis, acute cholecystitis, acute pancreatitis, duodenal, typhoid and tuberculous visceral perforation, small bowel obstruction, large bowel obstruction, mesenteric ischemia and pelvic abscess. Gender and age were not significantly linked with the presentation of the above-mentioned diagnoses.

Conclusion: Acute appendicitis has been found to be the most common cause of acute abdomen presenting in emergency of Chaudhary Muhammad Akram Teaching and Research Hospital, Lahore, Pakistan irrespective age and gender, followed by acute cholecystitis and pancreatitis. This was followed by infectious perforations of small gut, and then mechanical obstructions of small and large gut. Mesenteric ischemia and pelvic abscesses were among the least common presenting diagnoses in the emergency room. There was no significant gender association found between the most common causes of acute abdomen and any specific gender.

Key words: Acute Abdomen, Acute Appendicitis, Acute Cholecystitis, Intestinal Perforation, Acute Pancreatitis, Typhoid Perforation, Small gut obstruction, large gut Obstruction, Sigmoid Volvulus.

Introduction

Acute abdomen is a very common presentation in the emergency room of every hospital covering a range of 5-10% (White MJ, n.d.). Acute abdomen cases can be categorized into two main groups: those that necessitate surgical intervention and those that can be managed without surgery. For cases requiring surgical treatment, a thorough clinical evaluation is conducted alongside various diagnostic investigations. Surgeons in the emergency room consider a range of differential diagnoses, which may include acute appendicitis, perforated peritonitis, infectious perforations, obstructions of the small or large intestine, ischemic conditions, abscess formation, blunt abdominal trauma, penetrating injuries, firearm-related injuries, and acute abdomen scenarios involving adhesion obstructions that do not respond to conservative management. In assessing these conditions, a multidisciplinary approach is often employed, incorporating imaging studies such as CT scans and ultrasounds, as well as laboratory tests to determine the underlying cause and guide treatment. Proper classification and timely intervention are crucial in managing these potentially life-threatening situations effectively (2). Acute abdomen hence can be defined as sudden severe abdominal pain(3). The non-surgical causes of acute abdomen comprise a significant percentage of acute abdomen needing triage and investigations to rule out need of surgical management and most commonly include gastric and cardiac emergencies (4,5). Surgical causes and non-trauma etiology of acute abdomen requiring surgical management follow the same pattern as mentioned before (Elhardello & MacFie, 2018; Hardy et al., 2013b). Although the risk of morbidity and mortality with increasing age shows a directly proportional trend (8). The most common cause of acute abdomen needing surgical management remains acute appendicitis followed by acute cholecystitis (9). Many nonspecific abdominal pains, other than non-surgical causes, presenting in the emergency room eventually need consultations by OBGYN (Obstetrics / Gynecology), Urologists and Pediatric surgeons (9,10). The differential diagnoses are investigated using relevant methods including testing the serological markers and radiological modalities beginning with X-Rays radiographs, Ultrasound (FAST) scans in the ER and including but not limited to CT (Computed Tomography) scans and endoscopies (11–13) with aim of ruling out causes needing referral to OBGYN and urological which may not need immediate general surgical intervention.

Method

A cross-sectional descriptive observational analytical study over a period of One Year One year from 1st January 2024 till 31st December 2024 conducted at Chaudhry Akram Teaching Hospital, Lahore including both genders, ages 18-80 years, all presenting with abdominal pain from 1st January 2024 till 31st December 2024. Patients refusing participation, patients with blunt abdominal trauma and medically managed causes of abdominal pain were excluded from the study. Patients were included using a nonprobability consecutive sampling technique with a confidence level (CL) of 95%. The data was collected in written form on proformas, and then tabulated in SPSS. Mean of age distribution calculated with standard deviation. Frequencies of all received causes of acute abdomen calculated and tabulated, and P value calculated of acute appendicitis as the most common cause of acute abdomen calculated using SPSS. Chi-square test was applied to assess the significance of outcome variable.

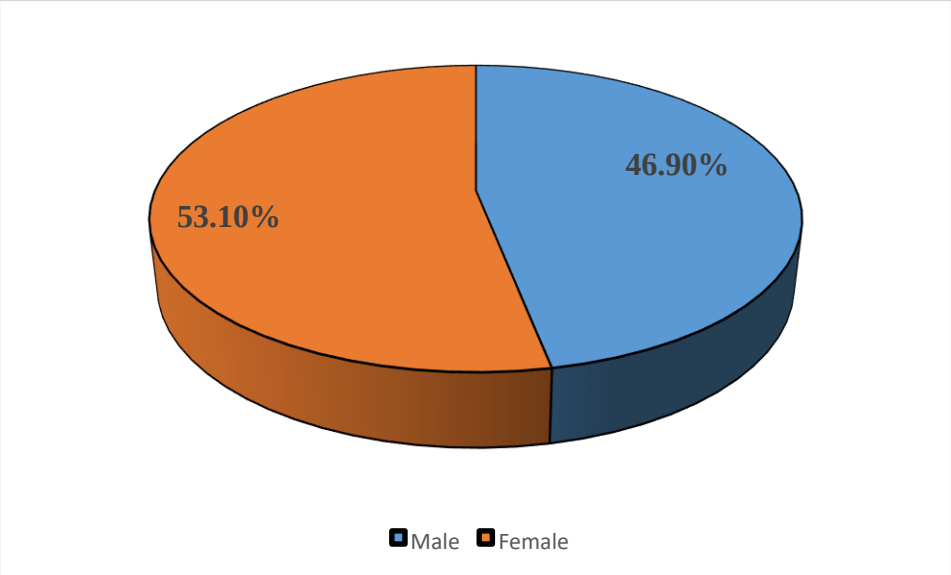
Results

The sample size for the study of the population falling in the inclusion criteria was 194 (n). From 194 patients, it was observed that the minimum age was 18 years and maximum age was 80 years with mean and standard deviation of the age was 48.61 ± 17.783 years (Table I).

Table I. Descriptive Statistics of age (n = 241)

	Min	Max	Mean	Std. Dev
Age	18	80	48.61	17.783

There were 91 (46.9%) male patients and 103 (53.1%) were female patients (Graph 1).



Graph 1. Pie chart of Gender

Causes of acute abdomen i.e., acute appendicitis was found in 56 (29%) cases, acute cholecystitis as 34 (17.6%), acute pancreatitis as 28 (14.5%), abdominal perforation (duodenal perforation) as 16 (8.3%), abdominal perforation (typhoid perforation) as 19 (9.7%), abdominal perforation (tuberculous perforation) as 5 (2.5%), abdominal obstruction (small bowel) as 18(9.2%), abdominal obstruction (large bowel) as 13 (6.27%), mesenteric ischemia as 4 (2.0%) and pelvic abscess was in only 1 (0.5%) case (Table II).

Table II. Distribution of causes of acute abdomen

Cause	Frequency	Percentage
AA	56	29
AC	34	17.6
AP	28	14.5
DP	16	8.3
TP	19	9.7
TB	05	2.5
SGO	18	9.2
LGO	13	6.7
MI	04	2.0
PA	01	0.5
Total	194	100

AA Acute Appendicitis; AC Acute Cholecystitis; AP Acute Pancreatitis; DP Duodenal Perforation; TP Typhoid Perforation; TB Tuberculosis; SGO Small Gut Obstruction; LGO Large Gut Obstruction; MI Mesenteric Ischemia; PA Pelvic Abscess.

It was found that there was no significant association between causes of acute abdomen and gender having p-value = 0.954 (Table III).

Table III. Stratification of Causes of acute abdomen with respect to Gender (n = 194)

Causes of acute abdomen

	AA	AC	AP	DP	TP	TB	SGO	LGO	MI	PA	Total	P-Value
M	23	16	14	9	6	2	12	7	2	0	91	
F	33	18	14	7	13	3	6	6	2	1	103	
Total	56	34	28	16	19	5	18	13	2	1	194	0.954

AA Acute Appendicitis; AC Acute Cholecystitis; AP Acute Pancreatitis; DP Duodenal Perforation; TP Typhoid Perforation; TB Tuberculosis; SGO Small Gut Obstruction; LGO Large Gut Obstruction; MI Mesenteric Ischemia; PA Pelvic Abscess.

No significant association was found between causes of acute abdomen and age group with p-value = 0.698 (Table IV) despite a slightly higher incidence of acute appendicitis, acute cholecystitis and enteric perforation due to typhoid fever in women, and a relatively higher incidence of small gut obstruction and large gut obstruction in men than women.

Table IV. Stratification of Causes of acute abdomen with respect to age (n = 194)

Causes of acute abdomen

AA	AC	AP	DP	TP	TB	SGO	LGO	MI	PA	Total	P-Value
Age											
<50 yrs		31	14	12	15	11	02	10	2	2	0	99
≥50 yrs		25	20	16	01	08	03	08	11	02	01	95
Total	56	34	28	16	19	05	18	13	04	01	194	0.698

Acute appendicitis was found to be somewhat more prevalent among individuals in the population younger than 50 years, albeit by a small margin. This trend in increased prevalence was similarly observed in cases of duodenal ulcer perforation, typhoid ulcer perforation, and small gut obstruction, suggesting a potential correlation between these conditions and age demographics. Conversely, when examining diagnoses that exhibited a slightly higher trend among individuals older than 50 years, conditions such as acute cholecystitis, acute pancreatitis, and large gut obstruction were noted. However, it is important to emphasize that these observed differences in prevalence between the two age groups are relatively minor and do not reach a level of statistical significance. While age does seem to play a role in the prevalence of certain gastrointestinal conditions, the differences observed are not significant enough to draw definitive conclusions. For instance, some diagnoses, such as small bowel obstruction, tend to occur slightly more frequently in males. Conversely, conditions that are more commonly diagnosed surgically, like acute appendicitis and typhoid perforation, show a somewhat higher incidence in females. These trends highlight the importance of considering gender and age as factors in the diagnosis and management of gastrointestinal issues, although the influence of these demographics should be viewed within the broader context of individual patient variability and clinical presentation. Further research may be needed to explore these patterns more deeply and understand their implications for treatment strategies.

Discussion

Chaudhary Muhammad Akram Teaching and Research Hospital, Lahore, Pakistan attracts patients from diverse societies throughout the city, but a significant portion of its caseload comes as referred patients in the surrounding areas of Punjab province. In addition to these referrals, many individuals come to the hospital for consultations, often after seeking treatment from various local practitioners. Some of these practitioners may be underqualified or unlicensed, as indicated by the patients' accounts of their previous care experiences. While we have not quantified instances of malpractice or negligence, such issues are present and cannot be overlooked (14). The hospital serves as a critical

hub for healthcare in the region, often taking in patients who have already experienced a range of medical opinions before arriving at its doors. This situation highlights the complexities and challenges faced by patients navigating the healthcare system, as well as the pressing need for quality assurance among local medical providers. The implications of inadequate training and oversight among practitioners are significant, potentially affecting patient outcomes and raising concerns about the overall standard of care in the area (14). From the patients received, included in the study and analyzed, there was no significant association between causes of acute abdomen and gender having p-value = 0.954 (Table 3); and between causes of acute abdomen and age group with p-value = 0.698 (Table 4). Multiple studies have shown similar proportions in findings in their settings with acute appendicitis as the most common surgical cause needing immediate surgical intervention; 22.4% acute appendicitis and 16% perforation peritonitis; 30.3% acute appendicitis and 27.9% intestinal obstruction; acute appendicitis 38.9%, gall bladder etiology 21%, renal/ureteric stones, perforation peritonitis, intestinal obstruction and bowel ischemia which were present in 74 (14.2%), 72 (13.7%), 41 (7.8%) and 23 (4.4%) respectively (Abhishek J, 2019; Agboola et al., 2014; Ravindra & R., 2016). A study from PIMS, Islamabad also stated acute appendicitis as the most common presentation with a high percentage of 51% (18). A study from Ghana showed most common presentation of acute appendicitis followed by ileal perforation due to typhoid and tuberculosis and intestinal obstruction as the most common cause (19). Two studies showed perforation peritonitis followed by acute appendicitis as the most common acute abdomen 39%, acute appendicitis 37%, Intestinal obstruction was found in 42 (14%) patients, ruptured liver abscess was found in 9 (3%) patients, gall bladder pathology and bowel ischemia were found in 6 (2%) patients, respectively and Meckel's diverticulitis was found in 3 (1%) patients; and perforation peritonitis and acute appendicitis ratios as 39.7% and 37.7% respectively (20,21). The findings revealed only minor variations in the trends of diagnoses among individuals under 50 years old compared to those over 50. However, to draw more definitive conclusions regarding the relationship between gender, age, and the causes of acute abdomen, larger sample sizes and multi-center studies are essential.

By increasing the number of participants and incorporating data from various medical centers, researchers can achieve a more comprehensive understanding of how these factors interact. Such studies would not only enhance the statistical power of the findings but also provide a broader perspective on the demographic influences on acute abdominal conditions. This could ultimately lead to improved diagnostic criteria and treatment protocols tailored to different age groups and genders.

Conclusion

The term "acute abdomen" encompasses a diverse range of abdominal signs and symptoms that can rapidly progress to severe complications, necessitating urgent surgical intervention. The importance of early diagnosis and prompt treatment cannot be overstated, as these factors significantly reduce both major morbidity and mortality rates, while also shortening the duration of hospital stays for affected patients and contributing significantly in managing the patient turn over in the hospital. Among the various causes of acute abdomen, acute appendicitis remains the most prevalent diagnosis leading to admissions in emergency departments, closely followed by acute cholecystitis.

Interestingly, when examining the demographics of those affected, neither gender nor age was found to have a significant association with the various causes of acute abdomen. This lack of correlation raises important considerations regarding the underlying risk factors for these conditions. Acute cholecystitis, as the second most common etiology for acute abdominal pain, highlights potential concerns surrounding dietary habits and lifestyle choices prevalent in the population. Furthermore, calculous cholecystitis has been shown to have an association with acute pancreatitis, particularly in populations that do not typically engage in heavy alcohol consumption. This finding underscores the need to explore other potential risk factors, such as diet and genetic predispositions, that may contribute to these conditions in individuals who abstain from alcohol. One particularly alarming statistic is the unexpectedly high frequency of small gut typhoid perforation observed in surgical emergencies, which collectively accounts for approximately 20.5% of such cases. This significant

percentage cannot be overlooked, as it raises pressing concerns regarding the availability of clean drinking water for the general population, as well as the overall public awareness of sanitation and hygiene practices. The high incidence of infectious small gut perforation calls attention to the urgent need for public health initiatives aimed at improving access to clean water and educating communities about the importance of hygiene. Given the alarming rate of preventable causes leading to small gut perforation, there is an urgent necessity for targeted prevention strategies. Implementing effective public health campaigns and improving sanitary conditions are crucial steps that could substantially minimize the morbidity associated with the surgical management of this condition. By addressing these fundamental issues, we can hope to reduce the incidence of acute abdominal emergencies and improve overall health outcomes in affected populations.

The acute abdomen represents a group of abdominal signs and symptoms which can rapidly deteriorate and need urgent surgical treatment. Early diagnosis and prompt treatment decrease the major morbidity and mortality as well as the duration of hospital stay. Acute appendicitis is still the most common cause of admissions in emergency department for patients with acute abdomen followed by acute cholecystitis. Gender and age were not found to be significantly associated with the causes of acute abdomen. Acute cholecystitis being the second most common etiology of acute abdomen raises concern regarding dietary habits in the population. Calculous cholecystitis shows association with acute pancreatitis in a population which is predominantly not in the habit of alcohol consumption. The frequency of small gut typhoid perforation in surgical emergency is unexpectedly high collectively of 20.5% which must not be ignored and poses a strong question on the availability of clean drinking water to general population as well as the awareness of importance of the subject. Based on the percentage of infectious small gut perforation, a need for prevention of preventable causes is dire to minimize the morbidity associated with the surgical management of the condition.

Acknowledgments

Disclaimer

The study was conducted on actual data collected Chaudhry Akram Teaching Hospital.

Conflict of Interest

Funding Disclosure

No funding was needed from any party.

Patients' Consent

Detailed informed consent was taken from all the patients included in the study.

Contributions

Conception and design of work, Acquisition of data; Drafting and critical reviewal; Analysis and Interpretation of Data; Final Approval for Submission; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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