

## Retrospective Analysis of Etiology, Diagnosis, and Treatment in Patients with Acute Abdominal Pain

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**Citation:** Houhong Wang. *Retrospective Analysis of Etiology, Treatment Outcomes, And Risk Factors in Intestinal Obstruction*. *Int Clinc Med Case Rep Jour*. 2025;4(6):1-4.

**Received Date:** 10 January 2025; **Accepted Date:** 07 April 2025; **Published Date:** 03 June 2025

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### ABSTRACT

**Background:** Acute abdominal pain is a common presenting complaint in emergency departments, with diverse etiologies. This retrospective study aimed to analyze the etiology, diagnostic methods, and treatment outcomes in patients with acute abdominal pain.

**Methods:** Data from 150 patients with acute abdominal pain admitted to a single tertiary hospital between 2021 and 2023 were retrospectively reviewed. Patient demographics, clinical symptoms, laboratory tests, imaging findings, final diagnoses, and treatment modalities were analyzed.

**Results:** The most common etiologies were gastrointestinal disorders (42%, 63/150), followed by urological diseases (28%, 42/150) and gynecological conditions (15%, 22/150). Abdominal ultrasound had a diagnostic accuracy of 78% for urological diseases but only 55% for gastrointestinal disorders. Multivariate analysis showed that age  $\geq 60$  years (OR = 2.3, 95% CI: 1.2 - 4.5,  $p = 0.013$ ) and elevated C-reactive protein ( $\geq 50$  mg/L, OR = 2.1, 95% CI: 1.1 - 4.0,  $p = 0.028$ ) were associated with more severe underlying conditions.

**Conclusion:** Gastrointestinal disorders are the leading cause of acute abdominal pain. Imaging modalities vary in diagnostic accuracy depending on the etiology. Age and inflammatory markers can help identify patients with severe conditions.

**Keywords:** Acute Abdominal Pain; Etiology; Diagnosis; Treatment; Retrospective Analysis

### INTRODUCTION

Acute abdominal pain is one of the most common reasons for emergency department visits, accounting for a significant proportion of healthcare utilization [1]. The wide range of potential etiologies, from benign self-limiting conditions to life-threatening emergencies, poses challenges for accurate diagnosis and timely treatment [2]. Understanding the distribution of etiologies, effectiveness of diagnostic methods, and factors influencing treatment decisions can improve clinical management. This retrospective study aimed to analyze these aspects in patients presenting with acute abdominal pain.

## MATERIALS AND METHODS

**Patient Selection:** A total of 150 patients who presented to the emergency department of a tertiary hospital with acute abdominal pain (defined as pain onset within 72 hours) between January 2021 and December 2023 were included. Exclusion criteria were incomplete medical records, age <18 years, and a history of recent abdominal surgery that could confound the diagnosis.

**Data Collection:** Clinical data were retrieved from the hospital's electronic medical records, including age, sex, vital signs, pain characteristics (location, intensity, duration, radiation), associated symptoms (nausea, vomiting, diarrhea, dysuria), laboratory test results (white blood cell count, C-reactive protein, amylase, lipase, urine analysis), imaging findings (abdominal ultrasound, Computed Tomography [CT]), final diagnosis, and treatment (surgical, medical, or conservative management).

## STATISTICAL ANALYSIS

Categorical variables were presented as numbers and percentages and compared using the chi-square test or Fisher's exact test. Continuous variables were presented as mean  $\pm$  standard deviation or median (interquartile range) and compared using the t-test or Mann-Whitney U test. Univariate and multivariate logistic regression analyses were performed to identify factors associated with severe underlying conditions (defined as conditions requiring surgical intervention or resulting in intensive care admission). Odds Ratios (OR) with 95% Confidence Intervals (CI) were calculated. Statistical significance was set at  $p < 0.05$ , and all analyses were conducted using SPSS version 28.0.

## RESULTS

**Patient Characteristics:** The study cohort included 82 males (54.7%) and 68 females (45.3%), with a median age of 45 years (IQR: 32 - 60). The median pain duration before presentation was 12 hours (IQR: 6 - 24). Baseline characteristics are shown in [Table 1](#).

**Table 1.** Baseline Patient Characteristics

Characteristics	Total (n = 150)
Median Age (years)	45 (32 - 60)
Male Sex (%)	54.7 (82/150)
Median Pain Duration (hours)	12 (6 - 24)
Median White Blood Cell Count ( $\times 10^9/L$ )	10.5 (8.0 - 13.0)
Median C-reactive Protein (mg/L)	15 (5 - 30)

**Etiologies of Acute Abdominal Pain:** The most common etiology was gastrointestinal disorders (42%), including appendicitis (15%, 22/150), acute gastroenteritis (12%, 18/150), and diverticulitis (8%, 12/150). Urological diseases (28%) such as renal colic (18%, 27/150) and urinary tract infections (10%, 15/150) were the second most frequent cause. Gynecological conditions (15%) were mainly ectopic pregnancy (8%, 12/150) and pelvic inflammatory disease (7%, 10/150). The distribution of etiologies is summarized in [Table 2](#).

**Diagnostic Methods and Accuracy:** Abdominal ultrasound was performed in 120 patients (80%). It had a high diagnostic accuracy for urological diseases (78%, 33/42), correctly identifying 25 cases of renal colic and 8 cases of urinary tract infections. However, for gastrointestinal disorders, the accuracy was only 55% (35/63). CT scan

was conducted in 60 patients (40%), with an overall diagnostic accuracy of 85% across all etiologies. The diagnostic performance of different modalities is shown in [Table 3](#).

**Table 2.** Distribution of Etiologies of Acute Abdominal Pain

Etiology Category	Number (%)	Specific Etiologies	Number (%)
Gastrointestinal	63 (42)	Appendicitis	22 (15)
		Acute gastroenteritis	18 (12)
		Diverticulitis	12 (8)
		Others	11 (7)
Urological	42 (28)	Renal colic	27 (18)
		Urinary tract infection	15 (10)
		Others	0 (0)
Gynecological	22 (15)	Ectopic pregnancy	12 (8)
Other	23 (15)	Pelvic inflammatory disease	10 (7)

**Table 3.** Diagnostic Performance of Imaging Modalities

Imaging Modality	Number of Patients	Number of Correct Diagnoses	Diagnostic Accuracy (%)
Abdominal Ultrasound	120	76	63.3
	Urological Diseases	42	33
	Gastrointestinal Disorders	63	35
CT scan	60	51	85

**Factors Associated with Severe Conditions:** Univariate analysis showed that age  $\geq 60$  years, elevated white blood cell count ( $\geq 15 \times 10^9/L$ ), elevated C-reactive protein ( $\geq 50$  mg/L), and presence of peritoneal signs were associated with severe underlying conditions. Multivariate logistic regression identified age  $\geq 60$  years (OR = 2.3, 95% CI: 1.2 - 4.5,  $p = 0.013$ ) and elevated C-reactive protein ( $\geq 50$  mg/L, OR = 2.1, 95% CI: 1.1 - 4.0,  $p = 0.028$ ) as independent predictors [Table 4](#).

**Table 4.** Factors Associated with Severe Underlying Conditions

Variables	Univariate OR (95% CI)	p - value	Multivariate OR (95% CI)	p - value
Age $\geq 60$ years	3.1 (1.5 - 6.4)	0.002	2.3 (1.2 - 4.5)	0.013
White Blood Cell Count $\geq 15 \times 10^9/L$	2.5 (1.1 - 5.6)	0.029	1.8 (0.8 - 4.1)	0.13
C-reactive Protein $\geq 50$ mg/L	3.2 (1.4 - 7.3)	0.006	2.1 (1.1 - 4.0)	0.028
Presence of Peritoneal Signs	2.7 (1.2 - 6.1)	0.016	1.9 (0.8 - 4.4)	0.14

## DISCUSSION

This retrospective study provides insights into the management of acute abdominal pain. Gastrointestinal disorders emerged as the leading cause, consistent with previous reports [\[3\]](#). However, the diversity of etiologies highlights the importance of a comprehensive diagnostic approach.

The diagnostic accuracy of abdominal ultrasound varied significantly depending on the etiology. Its high accuracy for urological diseases supports its continued use as a first-line imaging modality for suspected renal or urinary tract conditions [\[4\]](#). In contrast, CT scan showed superior overall accuracy, making it a valuable tool when the etiology remains unclear after initial evaluation [\[5\]](#).

Age and C-reactive protein levels were identified as important predictors of severe conditions. Older patients are more likely to have complex underlying pathologies and may require more aggressive diagnostic and treatment strategies [6]. Elevated C-reactive protein reflects a systemic inflammatory response and can help clinicians prioritize patients for further investigation.

Limitations of this study include its single-center design, which may introduce selection bias, and the relatively small sample size for some subgroups. Future multicenter studies with larger cohorts are needed to validate these findings.

## **CONCLUSION**

Gastrointestinal disorders are the primary cause of acute abdominal pain. The choice of diagnostic imaging should be guided by the suspected etiology. Age and C-reactive protein levels can assist in identifying patients at risk of severe underlying conditions, enabling timely and appropriate management.

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