

The Role of Ultrasonography Examination in Patients Presenting to Emergency Medicine Department with Acute Abdomen

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Abstract: ***Background:** Acute abdomen is a frequent emergency presentation that requires prompt evaluation to determine the need for surgical intervention. Ultrasonography (USG) provides a rapid, non-invasive, and radiation-free diagnostic tool in such cases. **Objective:** To evaluate the diagnostic utility of ultrasonography in patients presenting with acute abdomen and its role in guiding early management decisions. **Methods:** This prospective observational study was conducted at a tertiary care hospital in Surat from April to October 2017. A total of 297 adult patients with acute abdomen were evaluated clinically and by ultrasonography. Data were analyzed descriptively. Similar designs have been used in prior studies evaluating imaging modalities in acute abdomen.^{5,7} **Results:** Out of 297 patients, 83% were male and 17% female. The 31–40-year age group had the highest incidence (27%). Sudden onset of pain was seen in 73% of cases. Ultrasonography identified appendicitis (27%), hepatobiliary disease (19%), pancreatitis (16%), renal pathology (11%), and others. USG findings significantly aided decision-making between conservative and surgical management. **Conclusion:** Ultrasonography is an essential first-line imaging modality for acute abdomen due to its diagnostic accuracy, availability, and safety.*

Keywords: Ultrasonography, Acute abdomen, Emergency medicine, Diagnostic imaging, Tertiary care

1. Introduction

Acute abdominal pain constitutes one of the most common emergency department presentations worldwide. Rapid differentiation between surgical and non-surgical causes is critical. Although computed tomography offers detailed evaluation, ultrasonography remains the primary diagnostic tool in many emergency settings because of its accessibility, cost-effectiveness, and absence of ionizing radiation. The present study evaluates the diagnostic role of ultrasonography in patients presenting with acute abdomen. It requires rapid differentiation between surgical and non-surgical causes for optimal outcomes.^{1,2}

2. Materials and Methods

This prospective observational study was conducted at the Department of Emergency Medicine, Government Medical College and New Civil Hospital, Surat, over six months (April–October 2017). A total of 297 adult patients (aged 17–69 years) with acute abdominal pain were included. Exclusion criteria included age <16 years, >70 years, and polytrauma. All patients underwent detailed history, clinical examination, and ultrasonography using a standardized abdominal protocol. Data were analyzed descriptively. Similar designs have been used in prior studies evaluating imaging modalities in acute abdomen.^{5,7}

3. Results

Among 297 patients, 83% were male and 17% female. The majority (27%) were aged 31–40 years. Pain was sudden in onset in 73% of cases. Localization was lower abdomen (39%), upper abdomen (37%), and generalized (24%). The most frequent diagnoses were appendicitis, hepatobiliary

diseases, pancreatitis, and renal calculi. The distribution pattern of diagnoses is consistent with previous literature.^{8,9}

Age (Years)	Patients (n)	Percentage
17–20	36	12%
21–30	78	26%
31–40	80	27%
41–50	53	18%
51–60	32	11%
>60	18	6%

Distribution of diagnoses based on ultrasonographic findings:

Diagnosis	No. of Patients	Percentage
Appendicitis	80	27%
Hepatobiliary diseases	60	19%
Pancreatitis	47	16%
Renal pathologies	33	11%
GI perforation	18	6%
Gynecological causes	12	4%
Others	47	17%

4. Discussion

Ultrasonography demonstrated high diagnostic value in acute abdomen evaluation. It accurately identified common conditions such as appendicitis, cholecystitis, pancreatitis, and renal calculi. Previous studies corroborate these findings, showing sensitivity and specificity exceeding 85% for appendicitis and hepatobiliary disorders. Ultrasonography offers real-time visualization, rapid results, and avoids radiation exposure, making it ideal for emergency settings and vulnerable populations. These findings are comparable to prior international studies reporting high sensitivity and specificity.^{3,4,9}

Operator dependency remains a limitation, emphasizing the need for structured training in point-of-care ultrasonography (POCUS) for emergency physicians. Nevertheless, its diagnostic yield, accessibility, and safety profile make ultrasonography the cornerstone of acute abdomen evaluation. Training in point-of-care ultrasonography (POCUS) is recommended by current guidelines.^{10,11}

5. Conclusion

Ultrasonography is a quick, accurate, and non-invasive diagnostic tool for patients presenting with acute abdomen. It effectively differentiates surgical from non-surgical causes and guides prompt management in emergency settings. It continues to be emphasized as a first-line modality for emergency evaluation.^{8,10}

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