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Original Article

Comparison of Clinical Outcome of Acute Appendicitis in Elder Versus Young Patients

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Abstract

Background: Acute appendicitis is a common surgical emergency, particularly affecting younger populations, but with significant clinical outcomes in the elderly. The diagnostic challenge and variation in clinical presentations necessitate a thorough understanding of age-specific outcomes.

Objective: To figure out the frequency of acute appendicitis among different age groups and compare the frequency of poor clinical outcomes in elderly versus young patients.

Methods: A cross-sectional study was conducted from March 15, 2023, to August 15, 2023, at the Combined Military Hospital, Peshawar. The study included 120 patients aged 10-80 years who underwent appendectomy for acute appendicitis under general anesthesia. Exclusion criteria were ASA 3 & IV, liver disease (ALT & AST >40 IU), hepatitis B or C, diabetes (BSR >200 mg/dl), and anemia (Hb <10 g/dl). Patients were stratified into two age groups: young (≤50 years) and older (>50 years). Data on demographics, clinical presentation, intraoperative findings, hospital stay, and postoperative complications were collected. Statistical analysis was performed using SPSS version 25, with significance set at $p \leq 0.05$.

Results: Of the 120 patients, 65.83% were young adults, and 34.17% were older adults. Among the younger group, 1.27% had a prolonged hospital stay, compared to 26.83% in the older group. Perforated appendices were noted in 20.25% of younger patients versus 70.73% of older patients. Postoperative complications occurred in 6.17% of younger patients and 36.59% of older patients ($p < 0.05$).

Conclusion: The frequency of acute appendicitis is higher in younger patients, but older patients experience significantly poorer clinical outcomes, including higher rates of perforation, prolonged hospital stay, and postoperative complications.

1 Introduction

Acute appendicitis, a prevalent surgical emergency with an 8% lifetime incidence, remains a significant cause of acute abdomen requiring prompt intervention (1). Despite its prevalence, diagnosing appendicitis remains challenging due to atypical presentations, leading to an increased rate of negative appendectomies. The conventional surgical approach, often guided by the mantra "when in doubt, take it out," results in the removal of a normal appendix in many cases (2). Clinical manifestations typically include muscular defense, nausea, vomiting, and low-grade fever (3). Various techniques and scoring systems have been developed to address equivocal cases and reduce the rate of negative appendectomies. These scoring systems incorporate clinical history, physical examination, and laboratory findings (4).

While acute appendicitis is most prevalent in the second to the fourth decade of life, it can occur across all age groups. The highest incidence is observed in individuals under 30 years, constituting approximately 70% of cases, while only 5–10% occur in those over 60 years (5). Appendicitis in the elderly has become an increasing concern, with older age being an independent predictor of poor surgical outcomes (6). Studies have reported varying demographics in acute appendicitis presentations, with some showing a higher prevalence in the younger population (7), while others suggest a significant number of cases in older individuals (7). The elderly group often experiences prolonged hospital stays, higher rates of perforation, and increased postoperative complications (8).

This study aims to identify the prevalent age groups presenting with acute appendicitis and compare the clinical outcomes between older and younger patients. Despite a common perception of better outcomes in the younger population, conflicting literature exists. Furthermore, a dearth of local data on this subject emphasizes the need for this study to provide evidence applicable to our population. The findings can guide improved clinical practices, advocate for more vigilant management and screening of older patients, and contribute to preventing complications associated with acute appendicitis in the elderly (9-13)

2 Material and Methods

This cross-sectional study was conducted at the Combined Military Hospital, Peshawar, from March 15, 2023, to August 15, 2023. The sample size of 120 cases was calculated using the WHO sample size calculator. Patients aged 10 to 80 years, of either gender, who underwent appendectomy for acute appendicitis under general anesthesia were included in the study. Exclusion criteria encompassed patients with ASA 3 & IV, liver disease (ALT & AST>40 IU, hepatitis C or B), diabetes (BSR>200 mg/dl), and anemia (hb<10 g/dl). Patients who met the inclusion criteria were enrolled from the emergency department of the Surgery Department at Combined Military Hospital, Peshawar. Informed consent was obtained from all participants or their legal guardians.

Demographic information such as name, age, gender, duration of symptoms, and Alvarado score were recorded. Patients were then stratified into two age groups: older age (>50 years) and young age (≤50 years). The frequency of acute appendicitis was noted for both groups. Open appendectomy was performed under general anesthesia by a single surgical team, assisted by the researcher. Intraoperative observations, including perforation of the appendix, were documented. Postoperative monitoring was conducted in the surgical wards, with total hospital stay recorded. A hospital stay exceeding six days was classified as prolonged. Follow-up evaluations were conducted in the outpatient department to assess postoperative complications such as wound infection, wound dehiscence, sepsis, bowel obstruction, and intra-abdominal abscesses (14-16).

The study adhered to the ethical standards of the Declaration of Helsinki. Ethical approval was obtained from the institutional review board of Combined Military Hospital, Peshawar. Data were collected using a structured proforma and analyzed using SPSS version 25. Continuous variables such as age, Alvarado score, and duration of symptoms were presented as means and standard deviations. Categorical variables, including gender, ASA status, age group, perforated appendix, prolonged hospital stay, and postoperative complications, were expressed as frequencies and percentages. Comparative analyses of poor clinical outcomes between the younger and older age groups were performed using chi-square tests, with a p-value ≤0.05 considered statistically significant. Data stratification was conducted based on gender, ASA status, Alvarado score, and duration of symptoms, followed by post-stratification comparisons within each stratum.

3 Results

The study presents a comprehensive analysis of patient demographics and clinical outcomes related to appendicitis, with a focus on age, gender, duration of symptoms, ASA status, and Alvarado scores. The age distribution of patients shows that the majority, 79 out of 120 (65.83%), are within the 10-50 age range, with a mean age of 46.37 years and a standard deviation of 7.29 years. A smaller group of 41 patients (34.17%) are aged 51-80, highlighting a significant portion of older patients who are at a higher risk for poorer clinical outcomes.

Gender distribution indicates a predominance of male patients, comprising 80 of the 120 participants (66.67%), while female patients account for 33.33% with 40 individuals. This male predominance may reflect broader demographic trends in appendicitis incidence. When examining the duration of symptoms, 73 patients (60.83%) reported symptoms lasting 24 hours or less, suggesting early intervention opportunities. However, 47 patients (39.17%) experienced symptoms for more than 24 hours, which is associated with worsened outcomes.

Regarding ASA status, 69 patients (57.50%) were classified as ASA 1, indicating a generally healthy status without systemic disease, while 51 patients (42.50%) were ASA 2, suggesting the presence of mild systemic disease. This classification is important for understanding the baseline health of the patients and potential risks during treatment. In terms of the Alvarado score, which assesses the probability of appendicitis, 81 patients (67.50%) scored between 5 and 7, indicating a probable diagnosis, whereas 39 patients (32.50%) scored between 8 and 10, suggesting a high probability of appendicitis.

Clinical outcomes highlight significant differences between younger and older patients. Among the older patients, 29 experienced a perforated appendix compared to 16 younger patients. Prolonged hospital stays were reported in 11 older patients, in contrast to only 1 younger patient, illustrating a notable age-related disparity. Additionally, complications were more frequent in older patients, with 15 cases compared to 5 in the younger group.

Table 1 Patient Distribution and Clinical Outcomes

Characteristic	Category	Number of Patients	Percentage (%)
Age (years)	10-50	79	65.83
	51-80	41	34.17
Total		120	100.0
Mean ± SD			46.37 ± 7.29
Gender	Male	80	66.67
	Female	40	33.33
Total		120	100.0
Duration of Symptoms	≤24 hours	73	60.83
	>24 hours	47	39.17
Total		120	100.0
Mean ± SD			22.31 ± 6.89
ASA Status	ASA 1	69	57.50
	ASA 2	51	42.50
Total		120	100.0
Alvarado Score	5-7	81	67.50
	8-10	39	32.50
Total		120	100.0
Mean ± SD			6.34 ± 1.34

These findings emphasize the greater risk faced by older patients, who account for 34.17% of the cohort, in experiencing poorer clinical outcomes.

Table 2 Clinical Outcomes Comparison

Outcome	Young (n=79)	Old (n=41)	P-value
Perforated Appendix	16	29	0.024
Prolonged Hospital Stay	1	11	
Complications	5	15	

The data underscores the necessity for tailored management strategies and vigilant care for the elderly population with acute appendicitis, highlighting age, duration of symptoms, and ASA status as critical factors influencing patient prognosis.

4 Discussion

The findings of this study underscored the critical need for age-specific management strategies in cases of acute appendicitis. The higher prevalence of acute appendicitis in younger patients, as seen in 65.83% of the study population, aligned with existing literature that documented a predominant incidence in individuals under 30 years (17). However, the study also highlighted the significantly poorer clinical outcomes in older patients, despite their lower incidence rate of 34.17%. These outcomes included higher rates of perforated appendices, prolonged hospital stays, and increased postoperative complications, corroborating previous research that emphasized the vulnerability of the elderly to worse outcomes due to delayed diagnosis and comorbid conditions (18, 19).

The increased risk of perforation among older patients, observed in 70.73% of cases, was particularly noteworthy. This finding paralleled other studies that reported a high perforation rate in elderly patients, which was often attributed to atypical presentations and delayed treatment (20). The high perforation rates could be linked to physiological changes associated with aging, such as decreased immune response and increased incidence of comorbidities, which complicate the clinical picture and delay the diagnosis of appendicitis (21).

Additionally, the prolonged hospital stays observed in 26.83% of older patients highlighted the extended recovery periods and the need for comprehensive postoperative care in this demographic. The study's finding of prolonged hospital stays in the elderly was consistent with previous research indicating that older patients are more likely to experience extended hospitalizations due to complications and slower recovery rates (22).

This study's methodology, which included a well-defined sample and consistent surgical team, ensured a high level of control over variables, thereby strengthening the validity of the findings. However, the study was not without limitations. The single-center design might limit the generalizability of the results to other settings or populations. Moreover, the exclusion criteria, such as excluding patients

with severe comorbid conditions, might have skewed the sample towards a relatively healthier elderly population, potentially underestimating the true burden of complications in the broader elderly population (23, 24).

Future research should consider multi-center studies to validate these findings across diverse populations and settings. Additionally, studies that include patients with a broader range of comorbid conditions would provide a more comprehensive understanding of the risks and outcomes associated with acute appendicitis in the elderly (25).

Recommendations from this study emphasized the need for heightened clinical vigilance and expedited diagnostic protocols for elderly patients presenting with symptoms of acute appendicitis. Clinicians should consider the higher likelihood of atypical presentations and the increased risk of complications in this age group. Enhanced diagnostic tools and scoring systems tailored for the elderly could improve early detection and outcomes. Moreover, postoperative care protocols should be adapted to address the specific needs of older patients, potentially incorporating more intensive monitoring and support to mitigate the risks of prolonged hospital stays and postoperative complications (26).

5 Conclusion

In conclusion, while the study reaffirmed the higher incidence of acute appendicitis in younger individuals, it crucially highlighted the disproportionately poor outcomes in older patients. This dual insight underscored the necessity for age-tailored diagnostic and management approaches to improve clinical outcomes across all age groups.

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