

Assessment of role of Alvarado score in diagnosis of acute appendicitis**Saurabh Chauhan¹, Azad Kumar Mourya², Brahma Nand^{2*}, Babita Chauhan³**¹Associate Professor, Department of Surgery, Government Medical College, Shivpuri, Madhya Pradesh, India²Senior Resident, Department of Surgery, Government Medical College, Shivpuri, Madhya Pradesh, India³Anesthesiologist, Department of Anesthesiology, District Hospital Shivpuri, Madhya Pradesh, India**Received: 12-03-2021 / Revised: 03-05-2021 / Accepted: 26-05-2021****Abstract**

Background: Acute Appendicitis is one of the commonest conditions responsible for admission of the patients to hospital for surgical treatment. The present study was conducted to assess role of Alvarado score in diagnosis of acute appendicitis. **Materials & Methods:** 128 suspected cases of acute pancreatitis of both genders were evaluated according to Alvarado scoring system as score 1-4: appendicitis unlikely, 5-6: appendicitis possible and 7-10: appendicitis highly probable. **Results:** Out of 128 patients, males were 68 and females were 60. Score 1-4 was seen in 20, 5-6 in 38 and 7-10 in 70. The difference was significant ($P < 0.05$). Alvarado scoring diagnosed 64 cases correctly. The positive predictive value was 91.4%. **Conclusion:** Authors found that high Alvarado score was indicative of acute appendicitis.

Keywords: Alvarado score, Acute appendicitis, Positive predictive value.

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Introduction

Acute Appendicitis is one of the commonest conditions responsible for admission of the patients to hospital for surgical treatment. The hospitalization rate for patients over 60 years old ranges from 18% to 42%. Acute appendicitis is the most common cause of an acute abdomen in young adult with a life time risk of about 6% [1]. Difficulty in diagnosis arise in very young, elderly patients and females of reproductive age because they usually have atypical presentation and many other conditions also present like appendicitis and literature shows that 2-7% of all adults on exploration have diseases other than appendicitis [2]. Fitz described the traditional signs and symptoms of acute appendicitis. The diagnosis of acute appendicitis is mainly clinical based on history, clinical examination and sometimes aided by laboratory investigations. [3] Imaging modalities are not requested routinely because they have been shown to add very little information unless there are complications. The definitive diagnosis is achieved at surgery and after histopathologic examination of the resected appendix. Delay in diagnosis and management may result in significant morbidity. [4] A number of scoring systems have been developed for aiding in the early diagnosis of acute appendicitis. Scoring systems are a valuable and

Results

valid instrument of discrimination between acute appendicitis and nonspecific abdominal pain. Alvarado scoring system, which was introduced in 1986, is one of these systems and is based on history, clinical examination and few laboratory findings [3]. The present study was conducted to assess role of Alvarado score in diagnosis of acute appendicitis.

Materials & methods

The present study was conducted among 128 suspected cases of acute appendicitis of both genders. All agreed to participate with written consent.

Demographic data such as name, age, gender etc. was recorded. A thorough clinical examination was performed. Baseline investigations were performed. Findings were evaluated according to Alvarado scoring system as score 1-4: appendicitis unlikely, 5-6: appendicitis possible and 7-10: appendicitis highly probable. Patient with Alvarado score 7 or greater, were subjected to Appendicectomy and rest of the patients were managed conservatively. Histopathological findings of Appendicectomy samples were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Table 1: Distribution of Patients

Total- 128		
Gender	Males	Females
Number	68	60

Table 1 shows that out of 128 patients, males were 68 and females were 60.

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Table 2:Alvarado scoring system

Alvarado scoring system	Number	P value
1-4	20	0.02
5-6	38	
7-10	70	

Table 2, Fig 1 shows that score 1-4 was seen in 20, 5-6 in 38 and 7-10 in 70. The difference was significant (P< 0.05).



Fig 1: Elective Appendectomy in 20 year male

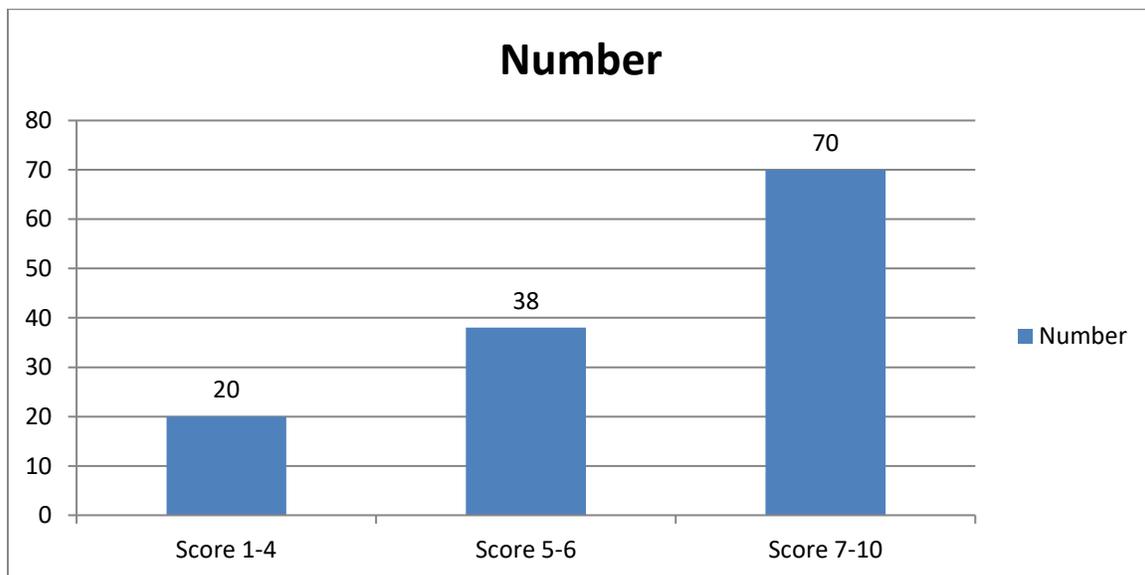


Fig 1: Alvarado scoring system

Table 3:Diagnostic accuracy of Alvarado score

Group	Confirmed appendicitis	Normal appendix
Alvarado score >7 (70)	64 (True positive)	6 (False positive)
Alvarado score <7 (58)	44 (False negative)	14 True negative)

Table 3 shows that Alvarado scoring diagnosed 64 cases correctly. The positive predictive value was 91.4%.

Discussion

Acute appendicitis is one of the commonest surgical emergencies in all ages. Diagnosis is mainly clinical, delay in diagnosis definitely increases the morbidity, mortality and cost of treatment, more aggressive surgical approach has resulted in increased white appendectomies.⁶ Acute appendicitis has remained the common acute surgical condition of the abdomen in all ages and of course, a common disease in surgical practice. Even after elapse of more than 120 years since its first description this common surgical disease continues to remain a diagnostic problem and can baffle best of the clinician. Delay in diagnosis definitely increases the morbidity, mortality and cost of treatment.⁷In equivocal cases, however, aggressive surgical approach as “when in doubt take it out” has

resulted in increased white appendectomies. Presentations of acute appendicitis can mimic variety of acute medical and surgical abdomino-thoracic conditions. Early diagnosis is a primary goal to prevent morbidity and mortality in acute appendicitis.⁸The present study was conducted to assess role of Alvarado score in diagnosis of acute appendicitis.In present study, out of 128 patients, males were 68 and females were 60. Jain et al⁹ in their study a total 100 cases hospitalized with abdominal pain, suggestive of acute appendicitis on the basis of modified Alvarado scoring system and were subsequently operated. Males belonging to young age group of 21-30 were most commonly affected. Abdominal pain was seen in 100% of patients. Fever seen in 87% of patients and vomiting in 78%. Modified Alvarado score of 9 had positive predictive value of 100% while negative predictive value 8.9%, while score between 7-8 had positive predictive value of 98.9% and negative predictive value

27.8%. The sensitivity was 86.1% and specificity was 83.3%. The ultrasonography showed a sensitivity of 94.68%. In present study rate of total white appendectomy was 6%. The Modified Alvarado scoring system is a reliable and practicable diagnostic modality to increase the accuracy in diagnosis of acute appendicitis and thus to minimise unnecessary appendectomy. We found that score 1-4 was seen in 20, 5-6 in 38 and 7-10 in 70. Alvarado scoring diagnosed 64 cases correctly. The positive predictive value was 91.4%. Awayshih et al¹⁰ in their study found that out of total 100 patients, appendicitis was confirmed in 80 patients, thus giving negative appendectomy rate of 20% (male 6%, female 14%). Perforation rate was 4%. Positive predictive value was 89%. The sensitivity was 54% and specificity 75%. Alvarado score is not a sensitive tool for aiding diagnosis of acute appendicitis. Waskale et al¹¹ validated the role of Alvarado score in diagnosis of acute appendicitis in total of 310 patients with clinical diagnosis of acute appendicitis were included in this study. Patients were examined thoroughly, investigated and managed accordingly. The relevant data collected and analysed. Out of 310 patients, surgical procedures were performed in 22.90% of the patients. The overall negative appendectomy rate was 9.86%, and the percentage of positive predictive value (PPV) for Alvarado score was 90.14%. Kohla et al¹² a total of 100 patients with acute lower abdominal pain suspecting acute appendicitis were included, examined clinically, and their modified Alvarado score was calculated. All specimens of appendectomies were sent to histopathological examination and then their results were compared with the results of modified Alvarado score. The results of this study showed that modified Alvarado score at the cutoff value of at least 7 has a sensitivity of 93.33%, specificity of 52.94%, accuracy of 84.42%, and negative appendectomy rate of 12.5%. The Alvarado score was a cheap, reliable, and reproducible diagnostic tool. When the score is high (≥ 7), there are strong indications for urgent surgery. When the score is low (< 4), the diagnosis of appendicitis is very unlikely.

Conclusion

Authors found that high Alvarado score was indicative of acute appendicitis.

Conflict of Interest: Nil

Source of support: Nil

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