ORIGINAL ARTICLE

UTILITY OF ALVARADO SCORE IN DIAGNOSING ACUTE APPENDICITIS IN CHILDREN: A CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: The diagnosis of acute appendicitis particularly in children is often challenging, occasionally taxing the skill of most experienced surgeon. It is difficult to obtain a clear history in children.

Objectives: The present study was planned with an objective to see the utility of Alvarado score in diagnosis of acute appendicitis.

Methods: Children in the age group of 5-15 yrs were enrolled in the study. All the patients were scored as early as possible. The decision of operation was made by the surgeon himself independent of the score. Finally the scores were correlated with subsequent clinical and operative findings of the patients and the histo-pathological examination of the removed appendix.

Results: A total of 64 patients were included, of these 48 patients were operated and remaining 16 patients improved rapidly with the start of the treatment. Of the 64 patients 38 were male, mean age was 11.4 years. Alvarado score were done all 64 patients. Out of 48 patients having appendisectomy 4 had normal appendix as proved on histopathology. Other 44 had complicated pathological report of appendix. It was found that patients with low Alvarado score have little chance to suffer from acute appendicitis.

Conclusion: The Alvarado score can be used as an aid in diagnosing acute appendicitis in children. Patients with score ≤5 are unlikely to need an emergency operation and can be observed as outpatient with little risk.

Key Words: Acute Appendicitis, Alvarado Score, children

INTRODUCTION

Acute appendicitis is one of the most common surgical emergencies with a lifetime prevalence of approximately 1 in 7[1]. It is associated with high morbidity and occasional mortality related to failure of making an early diagnosis. The classical symptoms and signs of acute appendicitis were first described by Fitz[2]. The diagnosis of acute appendicitis particularly in children is often challenging, occasionally taxing the skill of most experienced surgeon. It is difficult to obtain a clear history in children. There are very few patients who present with classical symptoms. There are many other gastrointestinal tract disease which mimic acute appendicitis[3]. So the diagnosis of acute appendicitis can be difficult, often requiring admission & inpatient observation.

In the management of acute appendicitis, early diagnosis and prompt surgical intervention is the key for successful management. Misdiagnosis and delay can lead to complications like perforation and peritonitis [4]. Many surgeons opine early intervention to avoid perforation accepting a negative appendicectomy rate of about 15-20%[4]. Various scoring systems have been developed to aid diagnosis of acute appendicitis[5]. Alvarado score was described in 1986[6]. Alvarado followed up the patients admitted to surgical unit with suspected acute appendicitis until surgery confirmed or refuted diagnosis. He found that 8 criterion had high diagnostic accuracy for acute appendicitis. The present study was planned with an objective to see the utility of Alvarado score in diagnosis of acute appendicitis

MATERIALS & METHODS

The present study was a cross-sectional study conducted in our facility on children who were admitted with suspected symptoms of appendicitis. The study included the children between 5 to15 years of age with suspected acute appendicitis. All the patients were scored as early as possible by the single investigator. The decision of operation was made by the surgeon himself independent of the score. Finally the scores were correlated with subsequent clinical and operative findings of the

patients and the histo-pathological examination of the removed appendix.

Table 1: Alvarado scoring system

Variables in Scoring system	Score
Symptoms	
Migrating right iliac fossa pain	1
Nausea, Vomiting	1
Signs	
Anorexia	1
Tenderness in right iliac fossa	2
Rebound tenderness in right iliac fossa	1
Laboratory findings	
Elevated temperature >37.3 C	1
Leukocytosis	2
Shift to the left of neutrophils 75%	1
Total Score	10

RESULT

A total of 64 patients were admitted with suspected symptoms of acute appendicitis. Of these 48 patients were operated with suspected acute appendicitis. The remaining 16 patients improved rapidly with the start of the treatment, diagnosis reviewed and was discharged within a few hours to 24 hours. Of the 64 patients 38 were male and 26 were female. Mean age of all the 64 patients was 11.4 years.

Table 2: Alvarado scoring distribution among all admitted patients

Alvarado score	No of patients
1-5	12
6	8
7-10	44

Table 3: Findings in operated patients

Operative findings	Number (%)
Inflamed appendix	28 (66.7)
Perforated appendix	5 (6.3)
Gangrenous appendix	4 (4.2)
Appendicular abscess	5 (12.1)
Mucocele appendix	2 (2.1)
Normal appendix	4 (8.3)

Table 4: Distribution of proven acute appendicitis among operated patients in relation to Alvarado Score

Score	Patients	Operated	Not operated
1-5	12	0	12
6	8	4	4
7-10	44	44	0

Alvarado score were done all 64 patients. Out of 48 patients having appendisectomy 4 had normal appendix as proved on histopathology. Other 44 had complicated pathological report of appendix.

DISCUSSION

In this study 48 patients were operated for suspected acute appendicitis. In 10% cases Negative appendisectomy were performed. Number of normal appendix in patients operated with diagnosis of acute appendicitis varies in different studies from 8% to 33%[7,8,9]. In the present study, rate of perforation/gangrene was 8% which is comparable to other studies[10,11]. while underdeveloped countries, rate up to 65% have been reported[12]. The study shows that out of 64 admitted patients, 48 underwent operation. Rest 16 were improved with treatment and discharged from the hospital. The percentage of patients needing operation (75%) is slightly higher[13]. The reason may be in our country people come comparatively late to doctor when the clinical feature become well developed. Those who improve by the time do not consult a surgeon.

In this study all the patients with Alvarado score ≤5 were improved with treatment and none were operated. 50% of the patients with score 6 were operated. Rests 50% improved & were discharged from the hospital. All the patients were operated with the score ≥7. Statistical analysis shows that with cut of score at 6, sensitivity will be 100%, specificity will be 82%, and positive predictive value 93%, negative predictive value 100% and accuracy rate will be 84%. The result is similar to other studies[13,14].

CONCLUSION

The Alvarado score can be used as an aid in diagnosing acute appendicitis in children. Patients with score ≤5 are unlikely to need an emergency operation and can be observed as outpatient with little risk.

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