JMSCR Vol||05||Issue||11||Page 30404-30407||November 2017

www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i11.100

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Evaluation of Alvarado Score in the Diagnosis of Acute Appendicitis

Author
Shubhi Bhatnagar
Department of Surgery, Dr.D.Y.Patil Medical College, Pune, Maharashtra, India-411018
Corresponding Author
Shubhi Bhatnagar
B-66,Old Girls' Hostel, Dr.D.Y. Patil Medical College, Pune, Maharashtra, India-411018
Phone No- 9000171777, Email: *shubhibhatnagar1@gmail.com*

Abstract
Acute appendicitis is a common and serious surgical illness with protean manifestations, generous overlap with other clinical syndromes, and significant morbidity, which increases with diagnostic delay. It can be diagnosed by computerized tomography scan of abdomen accurately but this is not always feasible due to its higher cost. Hence the need of a good scoring system is required. Alvarado scoring system is one scoring system used to diagnose acute appendicitis. 100 cases of pain in right iliac fossa were evaluated in terms of Alvarado score. Postoperative histopathology reports of appendix were compared with the Alvarado scores. It was seen in our study that 75% of cases showed a higher Alvarado score out of 99 histopathologically positive cases. Alvarado score is hence an efficient scoring system in the diagnosis of acute appendicitis.
Keywords: *acute appendicitis, Alvarado score.*

Introduction

Appendicitis is defined as an inflammation of the inner lining of the vermiform appendix that spreads to its other parts. This condition is a common and serious surgical illness with protean manifestations, generous overlap with other clinical syndromes, and significant morbidity, which increases with diagnostic delay. In fact, despite diagnostic and therapeutic advancement in medicine, appendicitis remains a clinical emergency and is one of the more common causes of acute abdominal pain.[1]

Appendicectomy remains the only curative treatment of appendicitis. The surgeon's goals are to evaluate a relatively small population of patients referred for suspected appendicitis and to minimize the negative appendicectomy rate without increasing the incidence of perforation. The surgeon must evaluate the larger group of patients who present with abdominal pain of all etiologies with the goal of approaching 100% sensitivity for the diagnosis in a time, cost and consultation efficient manner.[2]

Appendicitis is a transmural inflammatory process and a common cause of an acute abdomen. Inflammation that leads to perforation of the appendix, which is associated with increased morbidity and mortality, warrants prompt diagnosis.[2]

The aim of this study is to evaluate the efficacy of Alvarado score in the diagnosis of acute

appendicitis as this can prevent negative appendicectomies and can also prevent delay of surgery in positive cases.

Materials and Methods

In this prospective study, 100 cases of pain in the right iliac fossa are admitted. History and physical examination are carried out. All routine haematological investigations are done.Alvarado score is calculated for all the patients. Ultrasound (USG) of the abdomen is done. On the basis of positive Alvarado score or positive USG for acute appendicitis, patients are taken up for surgery (open or laparoscopic appendicectomy).

Post operative histopathological reports are compared with the Alvarado scores.A score of 7 is taken as high probability of acute appendicitis for Alvarado scoring system

Patients with a right iliac fossa mass or a diagnosed appendicular lump are excluded from the study.

Results

Table 1: Distribution of Cases according to Alvarado Score criteria

Criteria Score Symptoms	Score Value	Cases	Percentage
Migratory RIF(Right iliac fossa) pain	1	89	89.00
Anorexia	1	84	84.00
Nausea and vomiting	1	89	89.00
Signs			
Tenderness in RIF	2	100	100.00
Rebound tenderness	1	87	87.00
Elevated temperature >37.5°C	1	49	49.00
Laboratory			
Leucocyte count (>10x0x^9/l)	2	76	76.00
Shift to left	1	14	14.00
Total	10	100	100.00

Table 1 shows distribution of cases according to various criteria of the Alvarado score. Migratory RIF pain was observed in 89 cases; Anorexia was observed in 84 cases; Nausea and vomiting was observed in 89 cases. Among signs, tenderness in RIF was observed in all cases; Rebound tenderness was observed in 87 cases; Elevated temperature >37.5°Cwas observed in 49 cases; Laboratory cases; Leucocyte count (>10x0x^9/l) was observed in 76 cases; and Shift to left was observed in 14 cases.

Table 2: Distribution of cases according to Alvarado Score

	Cases (n=100)	Percentage
Alvarado score		
≥7	75	75.0
<7	25	25.0

The above table shows distribution of the cases according to Alvarado score. Alvarado score of 7 or more is suggestive of surgical intervention for appendicitis. Out of 100 cases, Alvarado score was less than 7 in 25% cases and it was 7 or more in 75% cases.

Table 3: Comparison of mean Alvarado score with histopathological finding of appendix

Histopathological Finding	Cases	Alvarado Score (Mean±SD)
Normal appendix	1	5*
Acute appendicitis	77	8.31±1.69
Suppurative appendicitis	12	6.69±1.00
Perforated appendicitis	7	6.11±1.89
Gangrenous appendicitis	3	7.34±2.03

* SD cannot be calculated for single sample

Table 3 shows distribution of cases of appendicitis according to histopathological findings. Out of 100 cases, in 77% cases it was acute appendicitis, in 12% cases it was suppurative appendicitis, in 7% cases it was perforated appendicitis and in 3 cases it was gangrenous appendicitis. In 1% case the appendix was normal.

Table 3 also shows mean Alvarado scores according to various histopathological groups of appendix. The mean Alvarado score was 8.31 in acute appendicitis, 6.69 in suppurative appendicitis, 6.11 in perforated appendicitisand 7.34 in gangrenous appendicitis. It was 5 in normal appendix.

Table 4: Comparison of Alvarado score with histopathological findings of appendix

Score	Histopathological diagnosis		Total
	Appendicitis (n=99)	No appendicitis (n=1)	
Alvarado score			
score ≥7	75 (75.8%)	0 (0%)	75
score <7	24 (24.2%)	1 (100%)	25

Table 4 shows comparison of Alvarado score with histopathological findings. Histopathological findings were group in to two categories – Appendicitis and no appendicitis. Case having normal appendix was 1, grouped in to 'No Appendicitis' group while remaining 99 cases with various types of appendicitis were grouped under 'Appendicitis'.

Among the 99 appendicitis cases, Alvarado score was suggestive of operative procedure in 75.8% cases.

Among the 1 non appendicitis case, Alvarado score was not suggestive of operative procedure and in the same group.

Discussion

Acute appendicitis is one of the most common surgical emergencies encountered in the world particularly among the young adults and children[3]. In the United States, the rate of negative appendicectomy is approximately 15% out of the total appendicectomies done each year. Surgeon's good clinical assessment is considered to be the most important requisite in the diagnosis of appendicitis. Several other conditions can mimic this clinical condition [4].

In our study 96 cases were between 12- 40 years of age. In our study 71 cases were males and 29 cases were females.

In our study, 100% had pain in the right iliac fossa. 84% and 89% cases had complained of anorexia and nausea, vomiting respectively. History of migratory RIF pain was given by 89% cases. Fever (elevated temperature >37.5°C), distension of abdomen and urinary complaints were present in 49%, 2% and 11% cases respectively.

In our study, Alvarado score was less than 7 in 25% cases and it was 7 or more in 75% cases. In a study by Regar MK et al[5] Alvarado score when applied in all the clinically suspected patients, has 65% cases with score >7 and 35% cases with score less than 7. In a study by Nasiri S et al[6] 65.33% patients had Alvarado score≥ 7 and 34.67% patients had Alvarado scores<7. This study shows that almost two thirds of symptomatic cases had Alvarado score ≥ 7and our study is comparable with the studies above. Contrary to these results, a study by Chong CF et al[7]found that out of 192 cases 80 (41.66%) had Alvarado score ≥ 7 and in remaining 112 cases it was <7.

Among the 99 appendicitis cases, Alvarado score was suggestive of operative procedure in 75.8% cases.

The mean Alvarado score was 8.31 in acute appendicitis, 6.69 in suppurative appendicitis, 6.11 in perforated appendicitis and 7.34 in gangrenous appendicitis. It was 4.9 in normal appendix.

Conclusion:

Alvarado score is efficient in the diagnosis of acute appendicitis and should be considered while deciding the further management of the case.

Sources of support- None

References

1. Cruz DB, Friedrisch BK, Junior VF, da Rocha VW. Unusual presentation of more common disease/injury: Eosinophilic acute appendicitis caused by Strongyloides-stercoralis and Enterobiusvermicularis in an HIV-positive patient. BMJ Case Reports. 2012;2012.
2. Karamanakos SN, Sdralis E, Panagioto-poulos S, Kehagias I. Laparoscopy in the emergency setting: a retrospective review of 540 patients with acute abdominal pain. Surg Laparosc Endosc Percutan Tech. 2010 Apr. 20(2):119-24.

3. Williams GR. Presidential address: A history of appendicitis. Ann Surg. 1983;197:495-506.
4. Flum DR, Morris A, Koepsell T, Dellinger EP. Has misdiagnosis of appendicitis decreased over time? A population based analysis. JAMA. 2001;286:1748-53.
5. Regar MK, Choudhary GS, Nogia C, Pipal DK, Agrawal A, Srivastava H. Comparison of Alvarado and RIPASA scoring systems in diagnosis of acute appendicitis and correlation with intraoperative and histopathological findings. IntSurg J 2017;4:1755-61.
6. Nasiri et al.: Diagnostic values of ultrasound and the Modified Alvarado Scoring System in acute appendicitis. International Journal of Emergency Medicine 2012 5:26.
7. Chong C F, Thien A, Mackie A J A, Tin A S, Tripathi S, Ahmad M Aet al. Comparison of RIPASA and Alvarado scores for the diagnosis of acute appendicitis. Singapore Med J 2011; 52(5) : 340-5.