



DIAGNOSTIC ACCURACY OF ALVARADO SCORING FOR DIAGNOSIS OF ACUTE APPENDICITIS

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ABSTRACT

Objective: To determine the diagnostic accuracy of Alvarado score in cases of acute appendicitis. **Methodology:** This was a cross-sectional validation study that was carried out during January to July 2018 at the Department of surgeries National Hospital and Medical centre and Fatima memorial Hospital Lahore. The cases were selected of either gender with age more than 12 years via non probability-consecutive sampling. The diagnosis of acute appendicitis was made on the basis of clinical signs and symptoms in the form of any degree of fever, vomiting and right sided abdominal pain assessed on visual analogue scale with raised total leucocyte count. True positive were labelled when there were inflammatory cells found on histopathology. The detailed Alvarado scoring system was used and to label the cut off value of 7 was used. **Results:** In the present study there were total 100 cases out of which 61 (61%) were males and 39% females. The mean age of the participants was 21.34 ± 6.12 years and mean duration of symptoms was $.12 \pm 1.47$ hours. Mean Alvarado score in this study was 5.31 ± 2.43 . The sensitivity, specificity, PPV, NPV and diagnostic accuracy of Alvarado score 7 or more was seen in 93.42%, 75%, 92.21% 78.26% and 89% respectively with a significant p value of 0.001. **Conclusion:** Acute appendicitis is a surgical emergency and Alvarado score 7 or above has shown significantly good diagnostic accuracy in these cases.

KEYWORDS: Appendicitis, PPV, NPV Alvarado score.

INTRODUCTION

Pain abdomen is common among children and among these acute appendicitis is one salient causes that is amongst the most common presentations and lead to surgical emergency. It is highly common and according to a survey every 1 out of seven cases has a life time risk to develop this infection. It can result in wide range of complications that can further add to overall morbidity and can result in fatal conditions like peritonitis and acute abdomen which can be fatal, hence need to be diagnosed early.^[1-2]

There is diverse clinical presentation and that's why the diagnosis is a dilemma and mimic various clinical scenarios that can result in a diagnostic challenge. Early surgery and better care can lead to decrease the risk of complications.^[3] It can be diagnosed on various clinical scoring and imaging studies. Alvarado scoring system is one of the most commonly used in such cases and comprise a range of clinical points on examination and supported by laboratory data. There are variable results regarding its diagnostic accuracy.^[4-5]

METHODOLOGY

Objective

To determine the diagnostic accuracy of Alvarado score in cases of acute appendicitis.

Methodology

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RESULTS

In the present study there were total 100 cases out of which 61 (61%) were males and 39% females. The mean

age of the participants was 21.34 ± 6.12 years and mean duration of symptoms was $.12 \pm 1.47$ hours. Mean Alvarado score in this study was 5.31 ± 2.43 as shown in table 01. The sensitivity, specificity, PPV, NPV and diagnostic accuracy of Alvarado score 7 or more was seen in 93.42%, 75%, 92.21% 78.26% and 89% respectively with a significant p value of 0.001 (table 02).

Table No. 01: Demographics.

	Mean	Range
Age (years)	21.34 ± 6.12	13-57
Weight (kg)	47.21 ± 11.68	29-78
Duration of symptoms (hours)	7.12 ± 1.47	1-24
Alvarado score	5.31 ± 2.43	3-9

Table No. 02: Diagnostic accuracy of Alvarado scoring (n= 386).

Alvarado score	Positive results on histopathology	Negative results on histopathology	Statistics
7 or above	TP 71	FP 06	p= 0.001
< 7	FN 05	TN 18	

TP= True positive, TN= True negative, FN= False negative, FP= False positive

Sensitivity= 93.42%, **Specificity**= 75%, **PPV**= 92.21%, **NPV**= 78.26%, **Accuracy**= 89%

DISCUSSION

Appendicitis is one of the most common causes of acute abdominal pain in all age groups. The key to a successful outcome is early diagnosis followed by appendectomy before gangrene or perforation develops. Although appendicitis occurs less frequently in young children, this group can be particularly difficult to diagnose because the presentation may be nonspecific. In addition, the evaluation can be challenging because the child is often apprehensive and uncomfortable.

In the present study, in cases presenting with acute appendicitis, the sensitivity of Alvarado score 7 or above was seen as 93.42%. The results of the present studies were higher as compared to the previous studies. According to studies done by Ahmad et al and Memon et al the sensitivity of Alvarado score above 7 was seen only in 58% and 53.3% respectively.^[6-7] However, the results were comparable to the studies where they used score 7 or less and was seen in the range of 85 to 100%.^[8-9]

The positive predictive value in this study was 92.21%. This finding was enforced by the results of studies done by Hizbullah et al and Ikramullah et al who had PPV of 85% and 83.5% respectively.^[10-11] However these results were at lower side when compared to other studies who found PPV approaching almost 100% by Memon et al and Majita et al who documented PPV of Alvarado scoring in the diagnosis of appendicitis to be 98.1% and 100% respectively.^[6,12]

The specificity in this study was seen in 75%. This was also supported by the study conducted by Jalil A et al where they found this specificity in 81% in their study^[13] and furthermore in another study this was seen in 70% of the cases.^[14-15]

The negative predictive value in this study was seen in 78.26%. Similar results were seen in other studies done

by Malik KA et al and Sanei B et al who found NPV of 69% and 72% respectively in their studies.^[16-17] While a study conducted by Jang SO found NPV of 81%.^[18]

CONCLUSION

Acute appendicitis is a surgical emergency and Alvarado score 7 or above has shown significantly good diagnostic accuracy in these cases.

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