



A Retrospective Study Comparing Modified Alvarado and Ripasa Scoring in Diagnosis of Acute Appendicitis

Nikhil Reddy P. V¹, Sreenath .T², Rup Kumar .K³, Shashank .G³, Muqqurub Ali Khan⁴
PG Student^{1,2}, Professor and HOD³, Senior Resident⁴
Department of General Surgery
Narayana Medical College and Hospital, Nellore, India

Abstract:

Background: Despite being a common problem, acute appendicitis remains a difficult diagnosis to establish, particularly among the young, the elderly and females of reproductive age, where a host of other genitourinary and gynaecological inflammatory conditions can present with signs and symptoms that are similar to those of acute appendicitis. Several scoring systems have been developed to aid in the diagnosis of acute appendicitis. The Alvarado score and the modified Alvarado score are the two most commonly used scoring systems. In 2010, RIPASA scoring system was developed and has been claimed to have better outcomes in Asian settings compared to the Alvarado scoring system

Methods: Retrospective study was done in cases proven to be acute appendicitis (based on intra operative findings) comparing the effectiveness of modified Alvarado and ripasa scoring.

Results: A total of 50 cases were taken and modified Alvarado and ripasa scorings were calculated. The sensitivity of modified Alvarado was 70% and that of ripasa was 88%

Conclusion: Ripasa scoring is more effective compared to modified alvarado in terms of sensitivity in the diagnosis of acute appendicitis however both the scoring systems need to be evaluated further by prospective studies comparing sensitivity, specificity, positive and negative predictive values.

I. INTRODUCTION

Acute appendicitis is one of the most common surgical emergencies, with a lifetime prevalence rate of approximately one in seven⁽¹⁾ Despite being a common problem, acute appendicitis remains a difficult diagnosis to establish, particularly among the young, the elderly and females of reproductive age, where a host of other genitourinary and gynaecological inflammatory conditions can present with signs and symptoms that are similar to those of acute appendicitis.⁽²⁾ A delay in performing an appendectomy in order to improve its diagnostic accuracy increases the risk of appendicular perforation and sepsis, which in turn increases morbidity and mortality. The opposite is also true, where with reduced diagnostic accuracy, the negative or unnecessary appendectomy rate is increased, and this is generally reported to be approximately 20%-40%.⁽³⁾ Several scoring systems have been developed to aid in the diagnosis of acute appendicitis. The Alvarado score and the modified Alvarado score are the two most commonly used scoring systems.^(3,4) However, these scoring systems were developed in western countries, and several studies have reported very low sensitivity and specificity when these scores are applied to a population with a completely different ethnic origin and diet.^(5,6) When applying Alvarado scoring systems to the middle Eastern, Asian or oriental populations It have been shown to achieve a sensitivity ranging from 50 to 59% and specificity ranging from 23 to 94% which was relatively low, and was attributed to different factors including diet and environmental factors.⁽⁷⁾ In 2010, RIPASA scoring system was developed by doctors in a hospital in Brunei named Raja Isteri Pengiran Anak Saleha, which includes other parameters than Alvarado as gender, age, duration of pain. These parameters are shown to affect accuracy of the diagnosis of acute appendicitis and has been claimed to have better outcomes in Asian settings compared to

the Alvarado scoring system.⁽⁸⁾ The aim of the study is to compare the two scoring systems i.e modified Alvarado and ripasa scoring in diagnosis of acute appendicitis.

Aims and objectives

To retrospectively compare the two scoring systems, modified Alvarado and ripasa scoring in patients who underwent appendectomy and proven to be a case of appendicitis by operative findings.

II. MATERIALS AND METHODS

This is a retrospective study conducted in Narayana Medical College and Hospital, Nellore, Andhra Pradesh, India. This is a retrospective study comparing the two scoring systems, modified Alvarado and ripasa scoring in diagnosis of acute

Appendicitis in all the patients who underwent appendectomy between the period January 2017 to January 2018 and proven to be case of acute appendicitis based on operative findings. Scoring charts were filled for both the scoring systems and the sensitivity was compared.

The parameters and scoring for ripasa scoring was done by taking reference from the study by Chong et al.⁽⁹⁾

The parameters and scoring for modified Alvarado was done by taking reference from the study by Kalan et al.⁽³⁾

Inclusion criteria

All the patients who underwent appendectomy between the period and diagnosed to be case of acute appendicitis based on operative findings were included in the study.

Exclusion criteria

Patients who underwent appendectomy for causes other than acute appendicitis were excluded from the study. Pregnant women were excluded from the study.

III. RESULTS OF THE STUDY

A total of 50 patients were included in the study. All the patients underwent appendectomy and proven to be a case of

acute appendicitis on the basis of operative findings. Modified Alvarado and ripasa scorings were calculated for all 50 patients and compared, the results as mentioned below

Table.1. Sex distribution of patients in this study

Sl.No	Sex	Number of patients
1	Male	38
2	Female	12

Table.2. Distribution of patients in RIPASA

Sl.No	RIPASA Score	Number of patients
1	<5	0
2	5-7.5	6
3	>7.5	44

Table.3. Distribution of patients in modified Alvarado

Sl.No	Modified Alvarado Score	Number of patients
1	<5	3
2	5-7	12
3	>7	35

Table.4. Sensitivity of RIPASA and modified Alvarado

Scoring	Sensitivity
Modified Alvarado at cut off point of 7	70%
Ripasa scoring at cutoff point of 7.5	88%

IV. DISCUSSION

This study is a retrospective study, a total of 50 patients were taken of which 38 are male and 12 are female.

Modified Alvarado scoring and ripasa scoring were compared by calculating the sensitivity. At cut off point of 7 for modified Alvarado the sensitivity was 70% i.e. 35 patients were diagnosed as having acute appendicitis out of 50 patients with acute appendicitis. At cut off point of 7.5 the sensitivity of ripasa scoring was 88% i.e. 44 patients were diagnosed as having acute appendicitis out of 50 patients.

Khan et al applied the Alvarado scoring system in an Asian population and only achieved a sensitivity and specificity of 59% and 23%, respectively, with a negative appendectomy rate of 15.6%.⁽⁶⁾

Another study by Al-Hashemy et al in 2004 using the modified Alvarado scoring system in a Middle Eastern population

reported a similarly low sensitivity of 53.8% and a specificity of 80%.⁽¹⁰⁾ However in this study we found the sensitivity of modified Alvarado to be 70%.

In 2010, RIPASA scoring system was developed by doctors in a hospital in Brunei named Raja Isteri Pengiran Anak Saleha, which includes other parameters than Alvarado as gender, age, duration of pain. In this present study the sensitivity of ripasa scoring was 88% which was similar to study by Chong et al which showed sensitivity of 88.46%.

V. CONCLUSION

This study shows that ripasa scoring is better when compared to modified Alvarado in the diagnosis of acute appendicitis, but since the sample size is small and is a retrospective study both the scoring systems need to be evaluated further by prospective studies.

VI. REFERENCES

- [1]. Stephens PL, Mazzucco JJ. Comparison of ultrasound and the Alvarado score for the diagnosis of acute appendicitis . *Conn Med.* 1999; 63:137–40.
- [2]. Gilmore OJ, Browett JP, Griffin PH, et al. Appendicitis and mimicking conditions. A prospective study. *Lancet.* 1975; 2:421–24.
- [3]. Kalan M, Talbot D, Cunliffe WJ, Rich AJ. Evaluation of the modified Alvarado score in the diagnosis of acute appendicitis: a prospective study. *Ann R CollSurg Engl.* 1994; 76:418–19.
- [4]. Alvarado A. A practical score for the early diagnosis of acute appendicitis. *Ann Emerg Med.* 1986; 15:557-64.
- [5]. Al-HashemyAM, Seleem MI. Appraisal of the modified Alvarado Score for acute appendicitis in adults. *Saudi Med J.* 2004;25:1229-31.
- [6]. Khan I, urRehman A. Application of alvarado scoring system in diagnosis of acute appendicitis. *J Ayub Med CollAbbottabad.*2005; 17:41-4.
- [7]. Khan I, Rehman A. Application of Alvarado scoring system in diagnosis of acute appendicitis. *J AyubMed CollAbbottabad.* 2005; 17:13-21.
- [8]. Wani MM, Yousaf MN, Khan MA, BabaAbdul A, Durrani M, Wani MM et al. Usefulness of the Alvarado scoring system with respect to age, sex and time of presentation, with regression analysis of individual parameters. *Internet J Surg.* 2007; 11(2):1-5.
- [9]. Chong CF, Thien A, Mackie AJ, Tin AS, Tripathi S, Ahmad MA, et al. Evaluation of the RIPASA score: A new scoring system for the diagnosis of acute appendicitis. *Brunei Int Med J.* 2010; 6:17-26.
- [10]. M Al-Hashemy, Ahmed &Seleem, Mohamed. (2004). Appraisal of the modified Alvarado Score for acute appendicitis in adults. *Saudi medical journal.* 25. 1229-31.