



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**EVALUATION OF RIPASA SCORE FOR ACUTE APPENDICITIS: A NEW DIAGNOSTIC SCORING SYSTEM**

**KEY WORDS:**

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**INTRODUCTION:**

Acute appendicitis is the most common cause of 'acute abdomen' in young adults and most common general surgical emergency. The incidence is 1.5-1.9 per 1,000 in the male and female population and is approximately 1.4 times greater in men than in women.<sup>(1)</sup> The diagnosis of acute appendicitis remains essentially clinical, requiring a mixture of history, observation & clinical knowledge. To increase the diagnostic accuracy in acute appendicitis have included ultrasonography, computed tomogram (CT) and laparoscopy also. However, these modalities are costly and may not be available when they are required.

Various scoring systems have been decided to aid diagnosis such as alvarado score, modified alvarado score, RIPASA score, anderson score. These diagnostic scoring systems has been developed to improve diagnostic accuracy of acute appendicitis. A delay in performing an appendicectomy in order to improve its diagnostic accuracy increases the risk of appendicular perforation and sepsis, which in turn increases morbidity and mortality. Early diagnosis is a primary goal to prevent morbidity and mortality in acute appendicitis.

RIPASA score is the new score developed in 2010 by Chong C F et al. It stands for 'Raja Isteri Pengiran Anak Saleha Appendicitis'.<sup>(1)</sup> The purpose of this study was to evaluate the diagnostic effectiveness of the RIPASA scoring system in clinical practice for diagnosis of acute appendicitis by correlating the score with operative and histopathological findings. RIPASA scores have 14 parameters and each parameter has score of 0.5, 1.0 or 2.0. Clinical signs like guarding and Rovsing's sign given extra weightage of 2.0 score.

**METHOD:**

Study was retrospective observational which was conducted in 100 patients, hospitalized with abdominal pain suggestive of acute appendicitis on clinical examination and investigations and operated in department of general surgery, Civil hospital, Ahmedabad. RIPASA scoring were given according to the databases. The data collected included the patients demographic data (age & gender), the presenting symptoms (RIF pain, migration of pain to the RIF, nausea and vomiting, anorexia and duration of symptoms), clinical signs (RIF tenderness, guarding, rebound tenderness, rovsing's sign and fever) & laboratory investigations (elevated white cell count & negative urinalysis).

**• INCLUSION CRITERIA**

All cases clinically suspected to be suffering from acute appendicitis between 12-70 years of age diagnosed on clinical examination and investigations.

**• EXCLUSION CRITERIA**

All patients with palpable lump in right iliac fossa.

Children below 12 years of age and persons above 70 years.

All patient who were selected between 12-70 years of age was

evaluated on basis of detailed history, physical examination, laboratory investigation, ultrasonography of abdomen-pelvis and RIPASA score. All patients have undergone ultrasonography of the abdomen primarily to rule out other conditions mimicking acute appendicitis.

All specimens of removed appendix were subjected for histopathological examination according to which the diagnosis was confirmed. Data thus collected was analysed.

Sensitivity, specificity, predictive value for positive and negative test and accuracy of each diagnostic modality were worked out and compare with histopathological outcome.

**RIPASA SCORE:**

No.	Parameters	Score
1	Male Female	1.0 0.5
2	Age < 39.9 Age > 40	1.0 0.5
3	RIF pain	0.5
4	Migration to RLQ pain	0.5
5	Anorexia	1.0
6	Nausea/vomiting	1.0
7	Duration < 48 hrs Duration > 48 hrs	1.0 0.5
8	RIF tenderness	1.0
9	RIF guarding	2.0
10	Rebound tenderness	1.0
11	Rovsing's sign	2.0
12	Fever	1.0
13	Raised WBC	1.0
14	Negative urine analysis	1.0

**RIPASA scoring system interpretation**

Total RIPASA score	Decision making guidelines
< 5.0	Probability of acute appendicitis is unlikely
5.0 – 7.0	Low probability of acute appendicitis
7.5 – 11.5	Probability of acute appendicitis is high
>12	Definite acute appendicitis

**RESULTS**

The study population consisted of 100 patients who had undergone emergency open appendicectomy. Highest incidence of appendicitis observed in the age group of <20 years of age, which accounts for 35 % of total no. of cases. Positive diagnosis of acute appendicitis was confirmed on histological analysis of the resected appendix in 70 patients, while 30 patients had a chronically inflamed appendix. 77 % of the patients operated for acute appendicitis were < 40 years of age,, while 33 % were > 40 years of age.

Age group	No. of cases	Percentage (%)
< 20	26	26 %

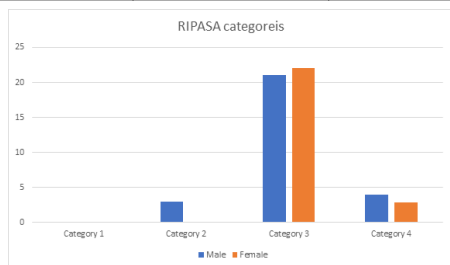
20-29	35	35 %
30-39	16	16 %
40-49	14	14 %
>50	9	9%

Majority of the patients in the study were male (65%). Male: female ratio was 1.85 : 1

Sex	No. of cases	Percentage (%)
Male	65	65 %
Female	35	35 %

**RIPASA score:**

RIPASA score	No. of cases	Percentage (%)
< 5.0	0	0 %
5.0 – 7.0	6	6 %
7.5 – 11.5	79	79 %
>12	15	15%



The Sensitivity of ultrasonography was 94.2%, positive and negative predictive values were 70.96 % and 42.85 % and accuracy was 69 %.

	HPR + ve	HPR -ve	Total
USG +ve	66	27	93
USG -ve	4	3	7
Total	70	30	100

In present study the sensitivity of RIPASA score is 92.85 and accuracy is 66%.

	HPR + ve	HPR -ve	Total
RIPASA +ve	65	29	94
RIPASA -ve	5	1	6
Total	70	30	100

**OBSERVATION:**

All these parameters can be helpful in the diagnosis of appendicitis, but no single test is definitive.

In present study, maximum incidence of appendicitis was seen in the age group of the 20-29 years, which is 35%. In present study we observed that the acute appendicitis has male predominance and the male female ratio is 1.85:1. In present study the most common symptom of acute appendicitis was pain in right iliac fossa followed by fever, vomiting. In present study the sensitivity of ultrasonography is 94.2 %. In present study the sensitivity of RIPASA score is 92.85 and accuracy is 66.

**CONCLUSION:**

The diagnosis of acute appendicitis primarily a clinical one that is based on proper history and repeated clinical examination. RIPASA score is a reliable diagnostic modality to increase the accuracy in diagnosis of acute appendicitis. (1) There is no definite single test or scoring system is available for the diagnosis of acute appendicitis.

**DISCUSSION:**

Acute appendicitis is one of the most commonly encountered surgical emergencies, especially by junior doctors on call, which emergency appendicectomy making up to 10% of all emergency abdominal surgeries. (7,8) Several scoring system, such as The Alvarado and modified Alvarado scoring system have been introduced since 1986 to help with the clinical decision making process in achieving an accurate diagnosis

of acute appendicitis in the fastest and cheapest way. (9,10) Several subsequent studies have shown its limitations when applied in an Asian or oriental population. (2)

RIPASA score is the new score developed in 2010 by Chong C F et al. It stands for 'Raja Isteri Pengiran Anak Saleha Appendicitis'. According to his study RIPASA scoring system has good sensitivity, specificity and diagnostic accuracy. It is simple and easy to use. (1) All the 14 parameters are easily obtainable from good clinical history, examination and investigations. One Meta-analysis of randomized trials done by Frountzas M, et al in 2018 concluded that RIPASA scoring system is more sensitive than Alvarado one, but the low specificity forms the need of a supplementary mean to provide the accurate diagnosis. Nevertheless, the wide and safe use of both tests is recommended in health system that lack electronic diagnostic tests, such as developing countries or rural hospitals. (6)

Another Scoring system, Appendicitis inflammatory response score (AIRS) was reported in 2008 by Anderson and Anderson. The AIRS system was more complicated, with 37-96 % sensitivity and 73-99 % specificity, depending on cut off threshold was set at > 4 or > 8. (9)

In conclusion, the RIPASA score is currently a much better diagnostic scoring system for acute appendicitis compared to other scoring system. It is helpful in taking decision with regard to a referral to on call surgical team, discharge or further observations. In terms of healthcare cost savings, the use of RIPASA score may help to reduce unnecessary admissions and expensive radiological investigations.

**REFERENCES**

1. Development of RIPASA score: A new appendicitis scoring system for the diagnosis for the diagnosis of acute appendicitis - Retrospective study done by Chong CF, et al. Singapore Med J. 2010.
2. A Comparative Study of RIPASA Score and ALVARADO Score in the Diagnosis of Acute Appendicitis: Prospective study done by Chong CF, et al. Singapore Med J. 2011
3. A Comparative Study of RIPASA Score and ALVARADO Score in the Diagnosis of Acute Appendicitis: Prospective study done by N N, et al. J Clin Diagn Res. 2014
4. Evaluation of modified Alvarado scoring system and RIPASA scoring system as diagnostic tools of acute appendicitis: Retrospective study done by Shuaib A, et al. World J Emerg Med. 2017
5. Which one is better? Comparison of acute inflammatory response, Raja Isteri Pengiran Anak Saleha Appendicitis and Alvarado scoring system: Prospective study done by Karami MY, et al. Ann Coloproctol. 2017
6. Alvarado Or RIPASA score for diagnosis of acute appendicitis? A meta-analysis of randomized trials: Frountzas M, et al. Int J Surg. 2018
7. Kumar V, Cotran RS, Robbins SL. Appendix. In: Robbins' Basic Pathology. 5Th ed. London: WB Saunders, 1992: 520.
8. Pal KM, Khan A. Appendicitis, a continuing challenge. J Pak Med Assoc 1998; 48: 189-92.
9. Anderson M, Anderson RE. The appendicitis inflammatory response score: a tool for the diagnosis of acute appendicitis that outperforms the Alvarado score. Wors J surg 2008; 32: 1843-9.
10. Kalam M, Talbot D, Cunliffe WJ, Rich AJ. Evaluation of modified Alvarado score in diagnosis of acute appendicitis: a prospective study. Ann R Coll Surg Engl 1994; 76: 418-9.
11. Alvarado A. A practical score for the early diagnosis of acute appendicitis. Ann Emerg Med 1986; 15: 557-64.