



General surgery

A PROSPECTIVE STUDY TO DETERMINE DIAGNOSTIC EFFICACY OF RIPASA SCORE VERSUS HISTOPATHOLOGY IN DIAGNOSIS OF SUSPECTED ACUTE APPENDICITIS IN A TERTIARY CARE HOSPITAL.

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ABSTRACT

INTRODUCTION: Acute appendicitis is one of the most common surgical emergency in clinical practice. Despite being a common problem, acute appendicitis remains difficult to diagnose. Hence, several scoring systems have been developed to diagnose appendicitis and to avoid negative appendicectomies. **OBJECTIVE:** To determine diagnostic accuracy of RIPASA score in diagnosing suspected acute appendicitis. **MATERIAL AND METHODS:** A study was conducted in our tertiary care hospital on 150 patients presented with right iliac fossa pain and suspected to have acute appendicitis in surgery OPD during the period of January 2021 to June 2021. RIPASA score was applied on each patient. **RESULTS:** In our prospective study, sensitivity of RIPASA score was found to be 96.49% and specificity 88.88%. The positive predictive value was 98% and negative predictive value was 80%. The diagnostic accuracy was found to be 95%. **CONCLUSION:** RIPASA score is simple scoring system with high sensitivity and specificity for diagnosis of acute appendicitis simply with the use of easily and quickly applied 14 clinical parameters.

KEYWORDS : RIPASA score, Acute appendicitis, Diagnostic accuracy, Histopathological correlation, Appendicectomy, Validity

INTRODUCTION:

Acute appendicitis is one of the most common surgical emergency in clinical practice with an estimated life time prevalence approximately in 1 in 7. The incidence is 1.5 to 1.9 per 1000 in male and female with approximately 1.4 greater in men than in women¹.

Diagnosis of acute appendicitis is based purely on clinical history and examination combined with a few laboratory investigations such as elevated white cell count. Despite being a common problem, acute appendicitis remains a difficult diagnosis to establish in some cases, particularly in the young, elderly and female patients of reproductive age group where a host of other genitourinary and gynecological inflammatory conditions can also present with similar signs and symptoms of acute appendicitis. Several scoring systems have been developed to aid in the decision making process of deriving a diagnosis of acute appendicitis in the fastest and cheapest way. The Alvarado score and the Modified Alvarado score are the two most commonly used scoring system available. Reported sensitivity and specificity for Alvarado and the Modified Alvarado score ranges from 53% to 88% and 75% to 80% respectively¹.

Raja Isteri Pengiran Anak Saleha Appendicitis is a simple qualitative scoring system based on 14 fixed parameters (two demographic, five clinical symptoms, five clinical signs and two clinical investigation and one additional parameter FNRIC). RIPASA score showed sensitivity and specificity of 88% and 67% respectively. RIPASA score has been developed in Asian population by Chee Fui Chong, department of surgery RIPAS hospital Brunei, Darussalam².

Accurate diagnosis is mandatory for surgical removal. Reduced diagnostic accuracy lead to unnecessary appendicectomy with a negative appendicectomy rate ranging from 15-20%. On the other hand, a delay in surgical intervention increases the risk of complication like perforation and sepsis which affect the morbidity and mortality³.

The present study conducted to determine diagnostic accuracy of RIPASA score with histopathological correlation during January 2021 to June 2021.

MATERIAL AND METHODS:

We conducted our study in tertiary care hospital after ethical clearance and included 150 patients presented to the emergency department or surgical OPD with right iliac fossa pain and suspected to have acute appendicitis during the period of January 2021 to June 2021. From our study, we excluded patients having lump in right iliac fossa, patients with history of trauma, patients with pelvic inflammatory disease or urolithiasis.

After initial assessment of patients presenting to outpatient or emergency department in tertiary care hospital with symptoms and signs suggestive of acute appendicitis who met the inclusion and exclusion criteria admitted and are initially subjected for detailed history taking, clinical examination, and investigations like routine hematological investigations like complete blood count, urine routine, X- ray chest and abdomen, ultrasound abdomen and CT scan as required.

Following which they were evaluated using RIPASA scoring system (Table no.1) but appendicectomy done on the basis of clinical assessment and hospital protocol. Histopathological correlation done with the score. A score of 7.5 was considered a cut-off value for high probability of acute appendicitis. Total score was calculated for each patient.

Table no. 1: RIPASA score sheet

Sr.no.		score
1.	Patient	
	Female	0.5
	Male	1.0
	Age <39.9 years	1.0
2.	Age >40 years	0.5
	Symptoms	
	RIF pain	0.5
	Pain migration to RIF	1.0
	Anorexia	1.0
	Nausea and vomiting	1.0
3.	Duration of symptoms <48h	1.0
	Duration of symptoms >48h	0.5
	Signs	
	RIF tenderness	1.0
4.	Guarding	2.0
	Rebound tenderness	1.0
	Rovsing sign	2.0
	Fever >37°C	1.0
	Investigations	
5.	Raised TLC	1.0
	Negative urine analysis	1.0
	Additional score	
	Foreign National Registration Identity Card	1.0
	Total maximum score	17.5

Diagnosis of acute appendicitis was confirmed by intra-operative findings and histopathological assessment of the appendicectomy specimen. Finally, the reliability of RIPASA scoring system is assessed

by calculating sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy.

Based on the results of this prospective evaluation, guidelines for management of patients suspected of acute appendicitis based on the RIPASA score were drawn up as shown in table no. 2.

Table no. 2: Management guidelines for patients presenting with RIF pain suspected of acute appendicitis

Total RIPASA Score	Management guidelines
< 5.0	Chances of acute appendicitis are almost nil. Advice observation of the patient in the ward and recalculate score after 1 to 2 hour if the score is decreasing, discharge and review in OPD. If increasing score, treat according to score level.
5.0 – 7.0	Very low probability of acute appendicitis, advice observation of the patient in the ward and repeat scoring after 1 to 2 hour or perform radiological investigations (abdominal ultrasound) to rule out acute appendicitis. If decreasing score, discharge and review in OPD. If increasing score or change, patient may need admission for observations, discussed with the operating surgeon on duty.
7.5 – 11.5	High probability of acute appendicitis, refer patient to on-duty surgeon for admission and repeat score after 1 to 2 hours. If remain high, prepare patients for appendectomy. In female patients, get radiological investigation such as an abdominal ultrasound to rule out gynecological causes of RIF pain.
>12	Appendectomy

RESULTS:

In our study of 150 patients, 61% (92) were male patients and 38% (58) were female patients. The highest number of patients (49%) were observed in the age group 15- 24 and the least number of patients (8.6%) were observed in the age group 45 and above as shown in figure no. 2.

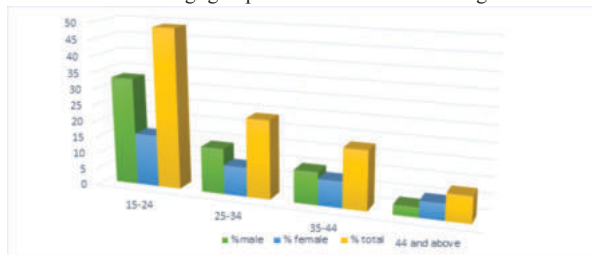


Figure no. 2: Age wise distribution of cases

132 cases out of 150 cases were subjected for emergency appendectomy. All specimen of excised appendix were sent for histopathological examination. Out of 132 cases who underwent appendectomy, 86% were confirmed cases of acute appendicitis, 4% cases were found to have perforated appendix and 13% cases were normal on histopathology as shown in the figure no. 3.



Figure No. 3. Histopathological Finding Wise Distribution Of Cases

Patients with RIPASA score less than 7.5 were 20(13%) and patients with score more than 7.5 were 112(74%). Patients with score more than 7.5 and positive histopathology report were 110(83%). Patients with score more than 7.5 but negative histopathology report were 2 (1%). Patients with score less than 7.5 and negative histopathology report were 16(12%). Patients with score less than 7.5 but positive histopathology were 4(3%). All depicted in table no.3.

Table no. 3: Validity of RIPASA score using histopathology confirmed appendicitis as gold standard.

RIPASA Score	Histopathology confirmed appendicitis		Total
	Present	Absent	
>7.5	110	2	112
<7.5	4	16	20
Total	114	18	132

Table no. 4 showing results of study:

True positive cases (score >7.5 and positive HPE)	110
False positive cases (score >7.5 but negative HPE)	02
True negative cases (score <7.5 and negative HPE)	16
False negative cases (score <7.5 but positive HPE)	04

So, if a cut-off value of 7.5 was used, sensitivity of RIPASA score was 96.49%, specificity 88.88%, positive predictive value 98% and negative predictive value was 80%. The diagnostic accuracy was found to be 95%.

DISCUSSION:

Acute appendicitis is one of the most common surgical emergencies encountered, especially by junior doctors during on- call duties with emergency appendectomy making up 10% of all emergency abdominal surgeries^{4,5}.

A quick and correct diagnosis of acute appendicitis leading to early appendectomy and avoidance of complication arising from perforation can be difficult at times. Ultrasound abdomen and pelvis has improved diagnostic accuracy as it rules out genitourinary and gynaecological condition but reveal no appendicular abnormality in early cases. Radiological modalities such as computed tomography (CT) imaging further aid in making a definite diagnosis and have been reported to have high sensitivity (94%) and specificity (95%) for diagnosing acute appendicitis⁶. Thus, in most large hospitals, it is routine to request for CT imaging in all patients suspected of acute appendicitis. However, such routine practice will inflate the cost of healthcare substantially⁷. Furthermore, the process of arranging for CT imaging may cause further delay for emergency appendectomy⁸.

Several scoring system such as the Alvarado and the Modified Alvarado scoring system had been introduced since 1986 to help with clinical decision making process in achieving an accurate diagnosis of acute appendicitis in the fastest and cheapest way. Despite good sensitivity and specificity when applied to a western population, both these scoring system have been to achieve low sensitivity and specificity, ranging from 50 to 59% and 23 to 94% respectively, when applied to middle eastern Asian or oriental population. As a result, there was development of new scoring system called RIPASA score by Chee Fui Chong, department of surgery in RIPAS hospital Brunei, Darussalam which consist of 14 parameters and one additional parameter (NRIC).

In our prospective study, sensitivity of RIPASA score was found to be 96.49% and specificity 88.88%. The positive predictive value was 98% and negative predictive value was 80%. The diagnostic accuracy was found to be 95%.

The RIPASA score is a simple and easy to use quantitative scoring system and as shown in appendix, most of these 14 clinical parameters are easily obtained from a good clinical history and examination. This also include urinalysis which can be easily performed on spot. Hence a score can be obtained quickly and a rapid diagnosis made without having to wait for the full investigation to be available when a score of > 7.5 is obtained. The additional parameter which is unique to our local population consists of foreign nationality. The RIPASA score can be applied in any country.

CONCLUSION:

The RIPASA score is a simple scoring system with high sensitivity and specificity for the diagnosis of acute appendicitis. The 14 clinical parameters are all present in a good history and examination and can be easily and quickly applied. Therefore, a decision on the management can be made early.

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Ethics approval:

The study was approved by the Institutional ethical committee.

Conflicts of interest:

There are no conflicts of interest.

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