Original Research

Determination of RIPASA score in patients with acute appendicitis

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ABSTRACT:
Background: Acute appendicitis is one of the most common and oldest surgical emergencies with an approximate estimated life time prevalence of approximately 8%. The present study was conducted to determine RIPASA score in patients with acute appendicitis. **Materials & Methods:** 80 patients (males- 45, females-35) with acute pancreatitis of both genders were evaluated using the RIPASA scoring system which has eight variables. Patients were divided into 4 ways depending on score such as <5, 5-7, 7.5-11.5 and >12. **Results:** RIPASA score in male and female was <5 seen in 10% and 12%, 5-7 in 10% and 16%, 7.5-11.5 in 60% and 40% and >12 in 20% and 32% respectively. The difference was significant (P< 0.05). **Conclusion:** RIPASA score is a better, easy, safe, and non-invasive diagnostic tool for diagnosis of acute appendicitis.
Key words: acute appendicitis, RIPASA, surgical emergencies

INTRODUCTION
Acute appendicitis is one of the most common and oldest surgical emergencies with an approximate estimated life time prevalence of approximately 8% with peak incidence in age group 10–30 years.[1] Acute appendicitis is one of the most common surgical emergencies encountered in every surgeon's life with a life-time prevalence approximately 8%. Even in the present scenario of recently developed new diagnostic techniques accurate diagnosis of acute appendicitis and decreasing the burden of negative appendectomy rate remains a challenge for surgeons.[2] Various scoring systems have been developed to assist diagnosis of acute appendicitis. These scores combine clinical history and physical examination with few laboratory parameters.[3]
The Raja Isteri Pengiran Anak Saleha appendicitis (RIPASA) scoring system is relatively new. It was developed in 2010 at the RIPAS Hospital of Brunei and has improved sensitivity (98%) and specificity (83%). Score interpretation suggests 4 management groups: a) < 5 points (unlikely, patient observation) b) 5-7 points (low probability, emergency room observation, abdominal ultrasound), c) 7.5-11.5 points (high probability, surgical evaluation and preparation for appendectomy), and d) > 12 points (appendicitis diagnosis, appendectomy).[4]

Different scoring systems have been created to increase the diagnostic accuracy of appendicitis that are low-cost, non-invasive, and easy to use or reproduce.[4,5] They assign numerical values to define signs and symptoms. Clinical signs of abdominal pathology (type, pain location and migration, temperature, signs of peritoneal irritation, nausea, and vomiting, among others) and laboratory findings are generally used.[5] The present study was conducted to determine RIPASA score in patients with acute appendicitis.

MATERIALS & METHODS
The present study was conducted among 80 patients (males- 45, females-35) with acute pancreatitis of both genders. All were informed regarding the study and written consent was obtained.
Data such as name, age, gender etc. was recorded. A thorough clinical examination was performed. Investigations such as urine routine, X-ray abdomen/chest, USG abdomen, and CT scan was performed. Patients were evaluated using the RIPASA scoring system which has eight variables. Patients were divided into 4 ways depending on score such as <5, 5-7, 7.5-11.5 and >12. Results of the study was clubbed and assessed statistically. P value less than 0.05 was considered significant.

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RESULTS
Table I RIPASA score sheet

| Parameters	Variables	Score
Gender	Female	0.5
	Male	1
	<39.9	1
	>40	0.5
Symptom	RIF pain	0.5
	Pain migration to RIF	1
	Anorexia	1
	Nausea and vomiting	1
	Duration of symptom <48 hours	1
	Duration of symptom>48 hours	0.5
Signs	RIF tenderness	1
	Guarding	2
	Rebound tenderness	1
	Rovsing sign	2
	Fever >37 degree	1
Investigation	Raised TLC	1
	Negative urine analysis	1
Additional score	Foreign national registration identity card	1
	Maximum score	17.5

Table I shows that total maximum score for patients found to be 17.5.

Table II The RIPASA score distribution of patients

RIPASA score	Male	Female	P value
<5	10%	12%	0.80
5-7	10%	16%	0.74
7.5-11.5	60%	40%	0.05
>12	20%	32%	0.15

Table II, graph I shows that RIPASA score in male and female was <5 seen in 10% and 12%, 5-7 in 10% and 16%, 7.5-11.5 in 60% and 40% and >12 in 20% and 32% respectively. The difference was significant ($P< 0.05$).

Graph I The RIPASA score distribution of patients
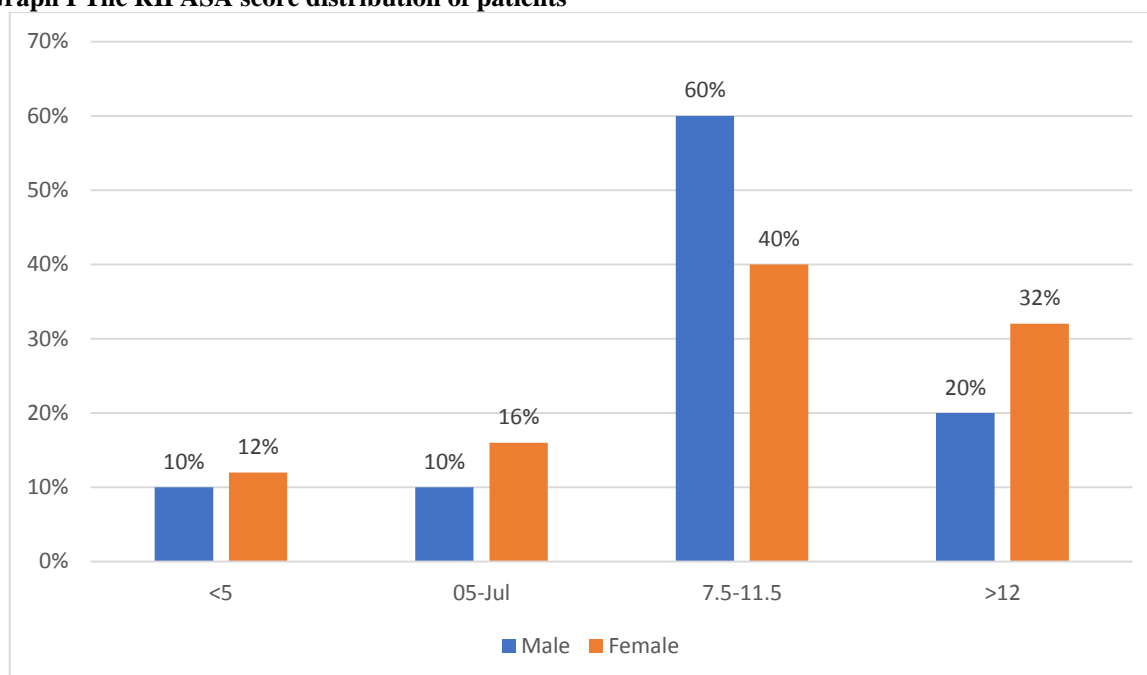
DISCUSSION

Acute appendicitis is the first cause of surgical emergencies worldwide, with an incidence of 1.17 to 1.9 per 1,000 inhabitants per year and a lifetime risk of presenting with it of 8.6% in men and 6.7% in women.[6] The most common age range is 25-35 years of age. Despite its being a common health problem, the diagnosis of acute appendicitis is still difficult to make, especially in young persons, the elderly, and in reproductive-age women. Various genitourinary or gynecologic inflammatory conditions can present with signs and symptoms similar to those of acute appendicitis. Diagnosis is based purely on the clinical history and physical examination, combined with the results of laboratory studies, such as a high white cell count.[7] Late appendectomy to improve diagnostic accuracy increases the risk for appendicular perforation and sepsis, augmenting morbidity and mortality (surgical site infection 8-15%, perforation 5-40%, abscesses 2-6%, sepsis and death 0.5-5%). In contrast, premature diagnosis of appendicitis leads to reduced diagnostic accuracy with a consequent rise in negative or unnecessary appendectomies that have been reported at approximately 20-40%. Ultrasound and tomography imaging can improve diagnostic accuracy, but are expensive and not always available at healthcare centers.[8] The present study was conducted to determine RIPASA score in patients with acute appendicitis.

In present study, total maximum score for patients found to be 17.5. Singh et al[9] included 200 patients presented to emergency or surgical OPD with right iliac fossa pain and suspected to have acute appendicitis. RIPASA score calculated but appendectomy done on the basis of clinical assessment and hospital protocol and histopathological correlation done with a score. A score of 7.5 is cut off threshold, results compared with previous studies. In our study of 200 patients, M:F ratio of 1.56:1. Sensitivity of the RIPASA score was 95.89% with specificity 75.92% and diagnostic accuracy of 90.5%, expected and observed rate of negative appendectomy were 8.5 and 12.35%, respectively. So there is net reduction in negative appendectomy rate by 3.85%. RIPASA score at a cutoff value of 7.5 is easier, cheap, and better diagnostic tool in equivocal case of right iliac fossa pain in Indian scenario of limited availability of recent diagnostic tool in remote areas and affordability of these tool in the available set up, simultaneously, it also helps to reduce negative appendectomy rates.

We found that RIPASA score in male and female was <5 seen in 10% and 12%, 5-7 in 10% and 16%, 7.5-11.5 in 60% and 40% and >12 in 20% and 32% respectively. Díaz-Barrientos et al[10] found that the RIPASA score with 8.5 as the optimal cutoff value: ROC curve (area .595), sensitivity (93.3%), specificity (8.3%), PPV (91.8%), NPV (10.1%). Modified Alvarado score with 6 as the optimal cutoff value: ROC curve (area .719), sensitivity (75%), specificity (41.6%), PPV (93.7%), NPV (12.5%). Pasumarthi et al[11] performed a analysis of 116 cases admitted with RIF pain during a 2 years period was performed. Patients between 15-60 years were scored as per Alvarado and RIPASA scoring system. Histopathological reports of the cases were collected and compared with the scores. ROC curve area analysis was performed to examine diagnostic accuracy of RIPASA and ALVARADO scores. The sensitivity of ALVARADO score is estimated to be 52.08 for a cut off of 6. The specificity is 80%, positive predictive value is 92.59, negative predictive value is 25.81. The Diagnostic accuracy of ALVARADO scoring is found to be 56.9. The sensitivity, specificity, positive predictive value and negative predictive values of RIPASA scoring system are 75%, 65%, 91.14%, 35.14%. The diagnostic accuracy of RIPASA score is 73.28.

Shuaib A et al[12] included patients with clinically suspected acute appendicitis were classified according to both Alvarado and RIPASA scoring systems before undergoing surgery. Histopathological examination of the removed appendix was taken as the gold standard for diagnosis of acute appendicitis. Among (90%) patients had histologically confirmed appendicitis. With the cut-off value greater than 7.5 for RIPASA score; sensitivity, specificity, positive predictive value, negative predictive value, diagnostic accuracy were 88.2%, 14.5%, 73.1%, 32% and 68% respectively. With the cut-off value greater than 7 for Alvarado score, sensitivity, specificity, positive predictive value, negative predictive value, diagnostic accuracy and negative appendectomy rates were 51.2%, 80 %, 91 %, 29%, and 57%, respectively. 87.5% of patients were correctly stratified by RIPASA under higher probability group while only 45% were classified by Alvarado as high probability.

CONCLUSION

Authors found that RIPASA score is a better, easy, safe, and non-invasive diagnostic tool for diagnosis of acute appendicitis.

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