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"A Clinical Study on Efficacy of Ripasa Scoring In Diagnosing Acute Appendicitis in Patients with Rif Pain''

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ABSTRACT:INTRODUCTION: Acute appendicitis is a very common diagnosis presenting in the emergency. Different scoring systems have been employed to assist in equivocal cases to attempt to reduce negative appendectomy rates. The most common being the alavardo score, butAlvarado score has not shown accuracy in diagnosing acute appendicitis in Asian population. TheRIPASA (raja isteri pengiran anak saleha appendicitis) score has been designed in a manner that would increase the diagnostic accuracy in the Asian population.

AIM: To determine the efficacy of RIPASA score in diagnosing acute appendicitis in patients presenting with right iliac fossa pain. The score is calculated preoperatively and patient taken up for surgery based upon clinical decision. The specimen is subjected to histopathology examination and diagnosis of acute appendicitis is confirmed.

Methods :A prospective clinical study that included patients who fulfilled the criteria of inclusion inThe study, from seven general surgical units at Siddartha medical college and Teaching Hospital from the period of January 2020 to March 2020. With Inclusion criteria of all patients presenting to the emergency with feature suggestive of acute appendicitis with age above 12.

Results: RIPASA had sensitivity of 93.75% (95% CI 69.77, 99.84) and specificity of 75.0% (95% CI 19.41, 99.37). It had a PPV of 93.75% (95% CI 73.32, 98.80), NPV of 75.0% (95% CI 29.28, 95.60), and a diagnostic accuracy rate of 90.00% (95% CI 68.30, 98.77). **Conclusion:** The RIPASA score is a simple scoring system with a reasonable sensitivity and specificity for the diagnosis of acute appendicitis.

Keywords: RIPASA score, Acute appendicitis, Raja IsteriPengiranAnakSaleha Appendicitis score, validity

I. INTRODUCTION

Acute appendicitis is one of the most common surgical emergencies worldwide, with an incidence of 1.17 to 1.9 per 1,000population per year and a lifetime risk of 8.6% in men and 6.7% in women. The most common age group affected is 25-35 years of age.[1,2].

Though it is a very common clinical condition the accurate diagnosis of acute appendicitis is still difficult, especially in elderly people and pregnant women. It can mimic various abdominal pathologies such as genitourinary and gynecological conditions. Generally it is accepted that 20-40% of operative procedures for acute appendicitis turn out to be negative appendicectomy. The diagnosis of acute appendicitis is mainly clinical though ultrasonogarm can be used to aid on the diagnosis of acute appendicitis it is not uniformly available in all health care centers and is operator dependent[3]. Hence a clinical score which uses clinical examination and available laboratory investigations is very useful in diagnosing appendicitis. One such score is the **Raja IsteriPengiranAnakSaleha Appendicitis score**[4]

RIPASA SCORE

Raja isteripengirananaksaleha appendicitis score

It's an 18 parameter score that is derived from clinical and laboratory examination. The total score is 17.5 and a cut off of above or equal to 7.5 is considered diagnostic of acute appendicitis. The patients were taken up for surgery based on clinical condition and their preoperative RIPASA score and histopathology were compared.

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	parameter	Score
1.	**Patient demography**	
	Female	0.5
	Male	1.0
	Age >40 years	0.5
	Age < 40 years	1.0
2.	**Symptoms**	
	RIF pain	0.5
	Pain migration to RIF	0.5
	Anorexia	1.0
	Nausea and vomiting	1.0
	Duration of symptoms < 48 hours	1.0
	Duration of symptoms > 48 hours	0.5
3.	**Signs**	
	RIF tenderness	1.0
	Guarding	2.0
	Rebound tenderness	1.0
	Rovsing sign	2.0
	Fever > 37 c < 39 c	1.0
4.	**Investigation**	
	Raised WBC	1.0
	Negative urine analysis	1.0
5.	**Additional score**	
	Non-Asian	1.0
	Total score	**17.5**

II. RESULTS AND STATISTICAL ANALYSIS

Validity of the score as a diagnostic test for appendicitis was identified by calculating its sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) along with 95% confidence interval (CI), and by using histopathological examination as a gold standard. Confidence intervals for sensitivity, specificity and accuracy are "exact"Clopper-Pearson confidence intervals[5] Confidence intervals for the predictive values are the standard logit confidence intervals given by Mercaldo et al. 2007.[6]

Total number of patients in study were 20 of which 16 were male and 4 were female.
Majority of patients were males (75%)

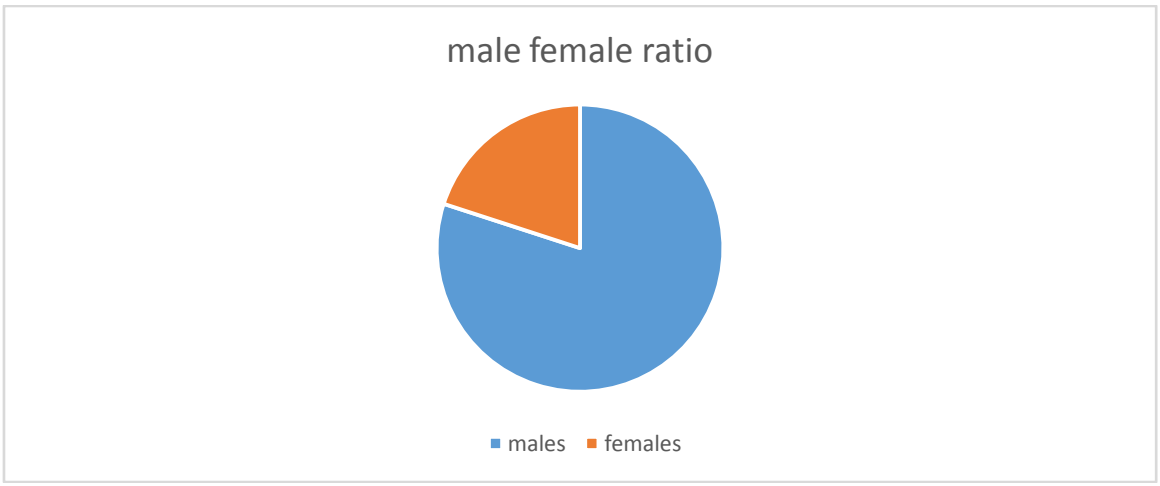

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Table 1.

Distribution of patients according to age group
The majority of cases were from age group 20-30 (40%)

Age group	Number of patients	Percentage
10-20	6	30%
20-30	8	40%
30-40	4	20%
>40	2	10%
Total	20	100%

Table 2

Distribution of patients according to RIPASA score

Score	Number of patients	Percentage
<5	2	10%
5-7	2	10%
7-11	12	60%
>12	4	20%
Total	20	100%

Out of the 20 patients admitted 16 patients were treated by emergency open appendicectomy. Out of the 16 specimens sent for histopathologic examination 15 turned out as acute appendicitis and 1 turned out to be normal.

Table 3.

On comparing with the histopathology report.

RIPASA Score	Histopathology confirmed appendicitis		Total
	Present	Absent	
>7.5	15	1	16
<7.5	1	3	4
Total	16	4	20

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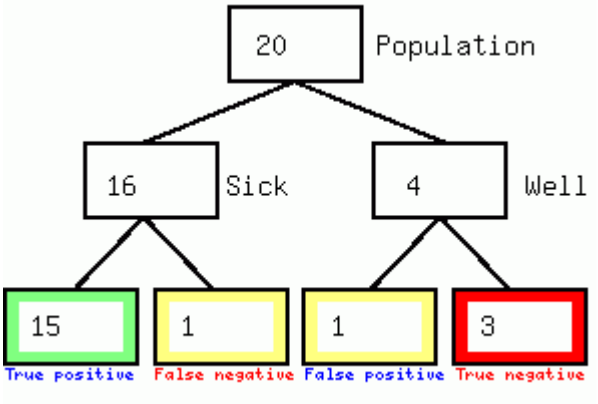
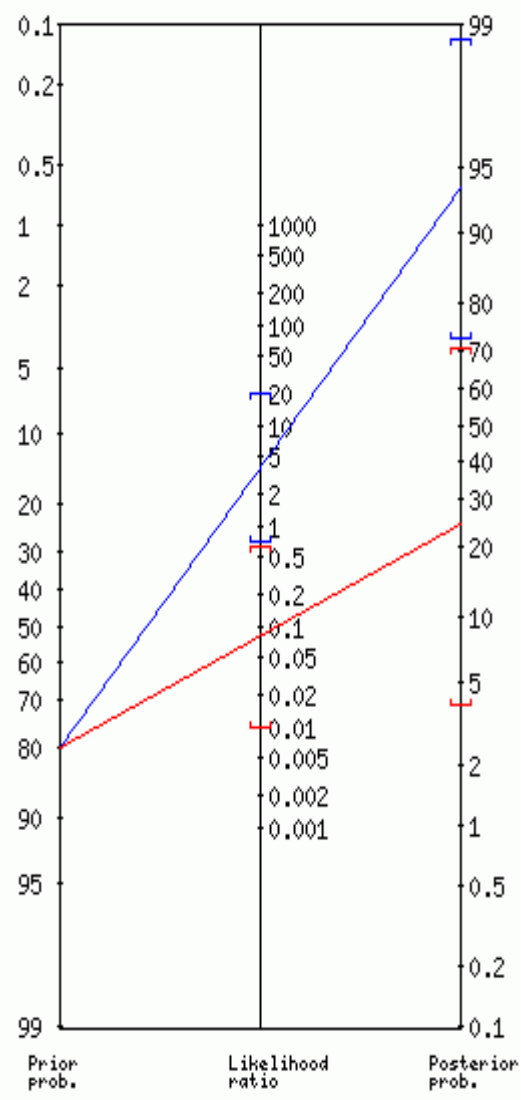
On statistical analysis of RIPASA score with histopathology examination it gave a sensitivity of 93.75% (95% CI 69.77, 99.84) and specificity of 75.0% (95% CI 19.41, 99.37). It had a PPV of 93.75% (95% CI 73.32, 98.80), NPV of 75.0% (95% CI 29.28, 95.60), and a diagnostic accuracy rate of 90.00% (95% CI 68.30, 98.77).





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Prior probability (odds):	80% (4.0)
POSITIVE TEST:	
Positive Likelihood ratio:	3.75
95% confidence interval:	[0.68,21]
Posterior probability (odds):	94% (15.0)
95% confidence interval:	[73%,99%]
(~ 1 in 1.1 with positive test	are sick)
NEGATIVE TEST:	
Negative Likelihood ratio:	0.08
95% confidence interval:	[0.01,0.60]
Posterior probability (odds):	24% (0.3)
95% confidence interval:	[4%,71%]
(~ 1 in 1.3 with negative test	are well)
Odds = Probability / (1-Probability)	
+LR = Sensitivity / (1 - Specificity)	
-LR = (1 - Sensitivity) / Specificity	
Posterior Odds = Prior Odds x LR	

III. DISCUSSION

Acute appendicitis diagnosis is made through the clinical history and physical examination of the patient with 75 to 90% accuracy, but it should be supported by laboratory studies.[7,8]

The RIPASA score is easy to use as a quantitative scoring system and all of the 18 clinical parameters are easily obtained from a good clinical history and examination, including urine analysis. Hence a quick clinical decision can be taken without waiting for reports of radiological investigations.[9]

It is now a common practice in major centers to perform a CT scan in all patients suspected of having acute appendicitis.[10] Recent reports have suggested that the indiscriminate use of CT scan may lead to the detection of early low-grade appendicitis and these patients may then be subjected to unnecessary appendicectomy, in a condition that would otherwise have resolved spontaneously with antibiotics therapy.[11]

Several scoring systems 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[12,13.]

Because of the poor sensitivity and specificity of both the Alvarado and the modified Alvarado scoring systems, the RIPASA score was developed, which was more applicable to our Asian population, given the nature of diet and high prevalence of parasitic infestation.[14]

This prospective evaluation of RIPASA score in our study had a PPV of 93.75% (score >7.50) and an NPV of 75.00% (score <7.50). The results clearly outperformed both the Alvarado and the modified Alvarado scores.[14]

The sensitivity and specificity of the RIPASA score in our study were 93.75% and 75.00%, respectively, whereas in a retrospective study done by other investigators, the sensitivity and specificity of Alvarado and modified Alvarado score was less and similar to the sensitivity and specificity of that of a CT scan[15,16.] By application of the RIPASA score, the number of costly CT scans that are to be performed to exclude acute appendicitis could be reduced.

IV. CONCLUSION

The RIPASA score is a simple tool to predict acute appendicitis in patients with RIF pain. It has an acceptable sensitivity and specificity and the 18 parameters used can easily be obtained in any center.

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