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Original Research Paper

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TO STUDY THE SENSITIVITY, SPECIFICITY AND RELIABILITY OF RIPASA SCORE IN ACUTE APPENDICITIS

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ABSTRACT Acute Appendicitis is a common but elusive surgical condition. It has many clinical mimickers and diagnosis is made on clinical basis. Ultrasound is used as an adjunct to diagnosis Some diagnostic system based on scoring of various clinical and laboratory findings has been made to increase diagnostic accuracy of acute appendicitis. one of these diagnostic system is Raja Isteri Pengiran Anak Saleha appendicitis (RIPASA) score which is rapid and useful diagnostic tool used. In this study we prospectively checked the sensitivity, specificity of RIPASA score in 60 patients who presented to casuality with suspicious diagnosis of acute appendicitis and found high specificity at higher cut off value indicating that RIPASA score is reliable in making Diagnosis of Acute Appendicitis.

KEYWORDS : Acute Appendicitis, RIPASA score, Sensitivity And Specificity.

INTRODUCTION

Appendicitis is the most common abdominal emergency with prevalence rate of 1 in 7 approximately.[1] Appendicitis is most common between the age of 10-20 years but can occur at any age with male to female ratio 1.4:1. Lifetime risk in the United States is 8.6% in males and 6.7% in females. Abdominal pain is the primary presenting complaint with diagnostic sequence of colicky abdominal pain around umbilicus followed by vomiting with migration to right iliac fossa. Loss of appetite is also a predominant feature and nausea and constipation are usually present.[2] Acute appendicitis mostly requires surgery but the rate of negative or unnecessary appendicectomy due to reduced diagnostic accuracy has gone up to approximately 30%.[4] A negative appendicectomy is an operation performed for suspected appendicitis in which the appendix is found to be normal on histopathological specimen.[5] Some diagnostic system based on scoring of various clinical and laboratory findings has been made to increase diagnostic accuracy of acute appendicitis. one of these diagnostic system is Raja Isteri Pengiran Anak Saleha appendicitis (RIPASA) score which is rapid and useful diagnostic tool used worldwide. RIPASA (Raja Isteri Pengiran Anak Saleha Appendicitis) score is relatively new score developed at RIPAS Hospital of Brunei in 2010.[6] RIPASA Score includes more parameters than Alvarado score as later did not contain parameters like age, gender, duration of symptoms and these parameter are shown to affect the sensitivity and specificity.[3] The RIPASA score has 18 variable which are divided into 4 groups (data, signs, symptoms and laboratory studies) and has been given value of 0.5 to 2 with maximum score of 16 and according to score probability of diagnosis is less than 5 score (appendicitis unlikely), 5-7 points (low probability), 7.5 to 11.5 (High probability) and greater than 12 (diagnosis of appendicitis).[6]
In this study we predict the sensitivity, specificity and Reliability of RIPASA score In Diagnosis of Acute Appendicitis.

RIPASA Score

Patient characteristics	Score
Gender	
Female	0.5
Male	1.0
Age	
<40 years	1.0
>40 years	0.5
Symptoms	
RIF pain	0.5
Pain migration to RIF	0.5
Anorexia	1.0
Nausea and vomiting	1.0
Duration of symptoms	
<48 h	1.0
>48 h	0.5
Signs	
RIF tenderness	1.0
Guarding	2.0
Rebound tenderness	1.0
Rovsing's Sign	2.0
Fever >37 C, <39 C	1.0
Investigations	
Raised WCC	1.0
Negative urinalysis	1.0
Foreign national	1.0
Total	16.5

WCC: White cell count, RIPASA: Raja Isteri Pengiran Anak Saleha Appendicitis, RIF: Right iliac fossa

MATERIAL AND METHODS

This study was carried out prospectively in 60 patients who present to casuality with suspicion of acute appendicitis. In each case detailed history was taken and all relevant investigation was done.RIPASA score was calculated individually and patient underwent emergency open appendicectomy. Final diagnosis was made on the basis of histopathological report. Sensitivity, Specificity, Positive predictive value and Negative Predictive value were calculated.

RESULT

The mean age of presentation of the patients involved in the study was 30.98 years. The minimum age was 12 years and maximum age was 68 years. The percentage of population above age of 40 was 18.3% and below 40 years was 81.7%. Of the total 60 patients involved in the study, 44 were male which is 73.3% and 16 were female which is 26.7%.

Table 1: Gender wise distribution of study participants (N = 60)

Gender	Frequency	Percentage
Male	44	73.3
Female	16	26.7
Total	60	100

Table 2 : Various variable of RIPASA score

Features	Frequency	Percentage
RIF Pain	58	96.7
Pain migration	1	1.7
Anorexia	40	66.7
Nausea/Vomiting	42	70
Symptom duration <48 hrs	46	76.7
Symptom duration >48 hrs	14	23.3
RIF tenderness	58	96.7
Guarding	49	81.7
Rebound tenderness	55	91.7
Rovsing's sign	40	66.7
Fever	44	73.3
Raised TLC	36	60
Negative urinalysis	54	90
Foreign national	0	0

Among the 60 patients involved in the present study, most common of the RIPASA variable were right illiac fossa pain (96.7%) and right illiac fossa tenderness (96.7%).

All the patient included in the study had undergone operative intervention. Total number of patients which were proved to be having appendicitis as per histopathological report were 58 (96.6%) and only 2 patients were reported to have normal appendix (3.4%).

Table 3 Distribution of patients on basis of biopsy.

	No. of patients	Percentage
Biopsy proven appendicitis	58	96.6%
Biopsy negative appendicitis	02	3.4%
Total	60	100

The sensitivity and specificity of RIPASA score was calculated to be 91.37% and 50% respectively at cut off value of 7.5. positive predictive value was 98.14% and negative predictive value 16.6%. (table 4)

Table 4

	Biopsy proven appendicitis	**Biopsy negative appendicitis**
RIPASA score >7.5 or more	53 (True positive)	1 (False positive)
RIPASA score < 7.5	5 (False negative)	1 (True negative)
Total	58	2

Sensitivity 91.37%
Specificity 50%
Positive predictive value 98.14% Negative predictive value 16.6%

The sensitivity and specificity of RIPASA score was calculated to be 51.72% and 100% respectively at cut off value of 12 or more. positive predictive value was 100% and negative predictive value 6.6%. (table 5)

Table 5

	Biopsy proven appendicitis	**Biopsy negative appendicitis**
RIPASA score >12 or more	30 (True positive)	0 (False positive)
RIPASA score <12	28 (False negative)	2 (True negative)
Total	58	2

Sensitivity 51.72%
Specificity 100%
Positive predictive value 100%
Negative predictive value 6.6%

Comparison of RIPASA score at 7.5 and 12 cut off.

Table 6

	Cut-off value 0f 7.5	Cut off value of 12	P value
Sensitivity	91.37%	51.72%	<0.001
Specificity	50%	100%	<0.001
Positive predictive value	98.14%	100%	0.209
Negative predictive value	16.6%	6.6%	0.085

When compared the sensitivity and specificity of RIPASA score at cut off of 7.5 and 12 the difference was found to be statistically significant with p value (<0.001). . In the present study we obtained a higher specificity at a cut-off value of 12 which shows that higher RIPASA score confirms higher specificity but at the cost of sensitivity. This indicates that higher RIPASA score is reliable in making diagnosis of acute appendicitis but chance of missing the case is higher at high cut off value.

DISCUSSION

Although acute appendicitis is one of the most common surgical emergencies encountered worldwide in the emergency rooms and it makes up for approximately 10% of all emergency surgeries, it is still one of the most misdiagnosed of all abdominal pathologies. It is generally accepted that the removal of the normal appendix is safer in questionable cases than delaying surgery which may lead to increase rate of complication. There have been many attempts to improve the accuracy of diagnosis of appendicitis. The evaluation mainly based on history and clinical finding, which is an important parameter in reaching a diagnosis of acute appendicitis. Despite this, making a quick, accurate diagnosis and early appendicectomy to avoid complications like perforation can be difficult. Various scoring system are in use to hasten the diagnosis of acute appendicitis. Scoring system reflects an inexpensive, non invasive and easy to use diagnostic aid. Alvarado score is the most commonly used scoring system worldwide but it has a low sensitivity in comparison to wertern population when applied to the oriental population. To overcome this limitation, RIPASA scoring system has been developed in 2010, consisting of easily obtainable clinical, laboratory parameters. Hence a score can be obtained quickly, and a rapid diagnosis can be made without having to wait for full investigations. In a retrospective study, the RIPASA scoring system has been shown to achieve better sensitivity (88%) and specificity (67%) than Alvarado scoring system in asian population.

The present study had involved a total 44 (73.3%) male and 16 (26.7%) females which were similar to study by Tinaikar et al where 68.23% were male and 31.77% were females and Sanjive et al where 70.7% were males and 29.3% were females confirming that males are mostly affected.[1,7] The sensitivity of RIPASA score in the present study at a cut-off valvue of 7.5 was 91.37% which is comparable with study of Tinaikar et al which shows sensitivity of 91.78% and Sanjive et al which shows sensitivity of 94.1% at cut-off value of 7.5. The specificity of RIPASA score in the present study at a cut-off value of 7.5 was 50% which is less in comparison to study of Tinaikar et al which shows specificity of 66.66% and Sanjive et al which shows specificity of 60% at a cut-off value of 7.5. When compared the sensitivity and specificity of RIPASA score at cut off of 7.5 and 12 the difference was found to be statistically significant with p value (<0.001). . In the present study we obtained a higher specificity at a cut-off value of 12 which shows that higher RIPASA score confirms higher specificity but at the cost of sensitivity. This indicates that higher RIPASA score is reliable in making diagnosis of acute appendicitis but chance of missing the case is higher at high cut off value. In present study 58 out of 60 that is 96.6% patients have proven histological appendicitis while only Two patients was in negative group. This study showed sensitivity of 91.37% and

specificity of 50% at cut off of 7.5 while sensitivity of 51.72% and specitivity of 100% at cut off of 12 (p value <0.001). In the present study we obtained a higher specificity at a cut-off value of 12 which shows that higher RIPASA score confirms higher specificity but at the cost of sensitivity. Positive predictive value in present study is 100% at cut off of 12 while 50 % at cut off of 7.5. This indicates that higher RIPASA score is reliable in making diagnosis of acute appendicitis but chance of missing the case is higher at high cut off value.

CONCLUSION

In the present study we obtained a higher specificity at a cut-off value of 12 which shows that higher RIPASA score confirms higher specificity but at the cost of sensitivity. This indicates that higher RIPASA score is reliable in making diagnosis of acute appendicitis but chance of missing the case is higher at high cut off value.

Conflict of interest none

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