International Surgery Jthisnal
Bhatnagar SP et al. Int Surg J. 2018 Jan;5(1):193-196
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20175893

Original Research Article

Evaluation of RIPASA score in the diagnosis of acute appendicitis

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Received: 04 November 2017
Accepted: 28 November 2017

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ABSTRACT

Background: Acute appendicitis is one of the most common surgical emergencies. Despite being a common problem, it remains a difficult diagnosis to establish, particularly among the young, the elderly and females of reproductive age The study aimed to compare the efficacy of RIPASA score in the diagnosis of acute appendicitis.
Methods: In this cross sectional comparative study, 100 cases of pain in the right iliac fossa were admitted and evaluated clinically. RIPASA score was calculated for all. Ultrasound (USG) of abdomen and pelvis was done. A positive RIPASA score or USG finding was the criteria for open appendicectomy. The postoperative histopathological reports were compared with the RIPASA scores.
Results: RIPASA score was positive in 90% cases. Histopathologically, appendicitis was present in 99% cases. One case of normal appendix histopathologically had a lower RIPASA score. This indicated that RIPASA score could correctly diagnose acute appendicitis in 90% cases.
Conclusions: RIPASA score is an efficient score in the diagnosis of acute appendicitis. As compared with ultrasonography of abdomen and pelvis, the RIPASA score is more diagnostic in cases of acute appendicitis. Negative findings of acute appendicitis on ultrasonography of abdomen and pelvis are not the diagnostic test to rule out appendicitis.

Keywords: Acute appendicitis, RIPASA score

INTRODUCTION

Acute appendicitis is one of the most common surgical emergencies encountered in the world particularly among the young adults and children.[1] In the United States, the rate of negative appendicectomy is approximately 15% out of the total appendicectomies done each year. Surgeon's good clinical assessment is considered to be the most important requisite in the diagnosis of appendicitis. Several other conditions can mimic this clinical condition.[2] Only contrast enhanced computerized tomography(CECT) of abdomen can diagnose the condition with very high sensitivity and specificity but it is not feasible to have this investigation done for each patient suspected to have appendicitis, particularly in countries with limited resthisces.[3,4]

No single sign, symptom, or diagnostic test accurately confirms the diagnosis of appendiceal inflammation in all cases, and the classic history of anorexia and periumbilical pain followed by nausea, right lower quadrant (RLQ) pain, and vomiting occurs in only 50% of cases.

Appendicitis may occur for several reasons, such as an infection of the appendix, but the most important factor is the obstruction of the appendiceal lumen. Left untreated, appendicitis has the potential for severe complications, including perforation or sepsis, and may even cause death. However, the differential diagnosis of appendicitis is often a clinical challenge because appendicitis can mimic several abdominal conditions.[5]

There has been a need of a scoring system that can overcome these problems with acceptable sensitivity, specificity and negative appendicectomy rate. The RIPASA score has been developed, which has claimed to have better outcomes in Asian settings.[6]

Aim and objective of the study was to compare the efficacy of RIPASA score in the diagnosis of acute appendicitis.

METHODS

This was a cross sectional study conducted in Dr. D. Y. Patil Medical College, Hospital and Research Center, Pune, Maharashtra. Sample size was 100 cases.

Inclusion criteria

Patients with the following criteria were included in the study:

- Pain in right iliac fossa
- Age >12 years

Exclusion criteria

Patients with the following criteria were excluded from the study:

- Patient presenting with a diagnosed appendicular lump.
- Patient presenting with a right iliac fossa mass.
- Age below 12 years

A score of 7.5 was taken as high probability of acute appendicitis for RIPASA scoring system. The decision on appendicectomy was solely based on the surgeon's clinical judgment after taking into consideration all the findings of clinical, laboratory and radiological investigations.

Ultrasound (USG) of abdomen and pelvis was done within 6 hthiss in all clinically suspected cases.

All patients clinically diagnosed as appendicitis and who were having a significant RIPASA score or a positive diagnosis of acute appendicitis on ultrasound of abdomen and pelvis were operated for appendicectomy (either by the open method or by the laparoscopic technique) and the specimens of appendix were sent for histo-pathological examination (HPE).

Post-operative histopathology report was compared with the scores. A score of 7.5 was the optimal cut off threshold for RIPASA scoring system.

The results of the RIPASA score were tabulated by using an appropriate statistical analysis.

RESULTS

Table 1: Distribution of cases according to RIPASA Score criteria.

Parameter score		Score Value	Cases	%
Sex	Male	1.0	71	71.00
	Female	0.5	29	29.00
Age	<39.9 years	1.0	96	96.00
	>40.0 years	0.5	4	4.00
Symptoms	RIF (Right iliac fossa) pain	0.5	100	100.00
	Migration of RLQ (Right lower quadrant) pain	0.5	89	89.00
	Anorexia	1.0	84	84.00
	Nausea and vomiting	1.0	89	89.00
Duration of symptoms	<48 hthiss	1.0	82	82.00
	>48 hthiss	0.5	18	18.00
Signs	RIF tenderness	1.0	100	100.00
	RIF guarding	2.0	11	11.00
	Rebound tenderness	1.0	87	87.00
	Rovsing's sign	2.0	31	31.00
	Fever	1.0	49	49.00
Laboratory	Raised WBC	1.0	76	76.00
	Negative urine analysis	1.0	93	93
	Foreign NRIC	1.0	0	0%
Total		17.5	100	100.00

Males were 71 and females were 29. Cases less than 40 years of age were 96 and more than 40 years were 4.RIF pain was observed in 100 cases, migration of RLQ pain was observed in 89 cases; Anorexia was observed in 84 cases, nausea and vomiting was observed in 89 cases. Duration of symptoms less than 48 hthiss was observed in 82 cases and more than 48 hthiss was observed in 18 cases. RIF tenderness was observed in 100 cases, RIF guarding was observed in 11 cases, Rebound tenderness was observed in 87 cases and Rovsing's sign was observed in 31 cases. Fever was observed in 49 cases. Raised WBC was observed in 76 cases; Negative urine analysis was found in 93 cases; and Foreign NRIC was observed in nil cases.

Table 1 shows distribution of the cases according to the RIPASA Score. RIPASA score of 7.5 or more is suggestive of surgical intervention for appendicitis. Out of 100 cases, RIPASA score was less than 7.5 in 10% cases and it was indicative of surgical intervention in 90% cases.

Table 2: Comparison of mean RIPASA score with histopathological findings of appendix.

Histopathological finding	Cases	RIPASA Score (Mean±SD)
Normal appendix	1	7*
Acute appendicitis	77	11.52±1.99
Suppurative appendicitis	12	9.03±1.32
Perforated appendicitis	7	8.44±1.44
Gangrenous appendicitis	3	8.02±1.82

* SD cannot be calculated for single sample

Table 2 shows distribution of cases of appendicitis according to histopathological findings. Out of 100 cases, in 77% cases it was acute appendicitis, in 12% cases it was suppurative appendicitis, in 7% cases it was perforated appendicitis and in 3 cases it was gangrenous appendicitis. In 1% case the appendix was normal. The mean RIPASA score was 11.52 in acute appendicitis, 9.03 in suppurative appendicitis, 8.44 in perforated appendicitis and 8.02 in gangrenous appendicitis. It was 7 in normal appendix. Thus the RIPASA scores were higher in appendicitis cases compared to normal appendix.

Table 3: Comparison of RIPASA score with histopathological findings of appendix.

Score	Histopathological diagnosis		Total
	Appendicitis (n=99)	No appendicitis (n=1)	
RIPASA score			
Score ≥7.5	90 (90.9%)	0 (0%)	90
score <7.5	9 (9.1%)	1 (100%)	10

Table 3 shows comparison of RIPASA score with histopathological findings. Histopathological findings were group in to two categories – Appendicitis and no appendicitis. Case having normal appendix was 1, grouped in to 'No Appendicitis' group while remaining 99 cases with various types of appendicitis were grouped under 'Appendicitis'. Among the 99 appendicitis cases, the RIPASA score was suggestive of operative procedure in 90.9% cases. Among the 1 non appendicitis case, the RIPASA score was also not suggestive of operative procedure.

Figure 1 shows distribution of the cases according to histopathological findings and USG findings. Out of 100 cases, in 66 cases USG findings were suggestive of appendicitis while 34 cases were normal. Among the 99 histopathologically confirmed cases of appendicitis, USG was showing appendicitis in 65 (65.7%) cases while among the 1 histopathologically non appendicitis case, USG was positive in that case.

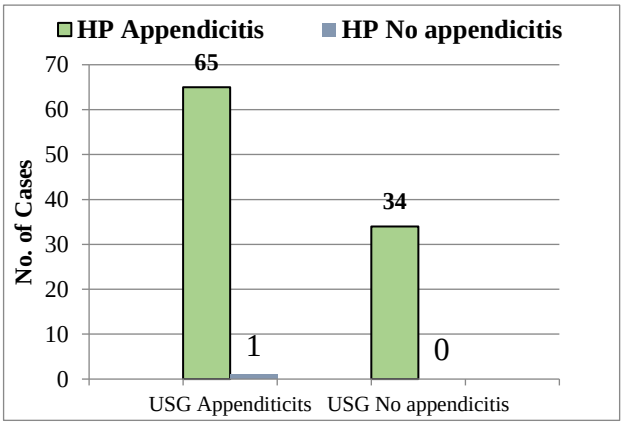

Figure 1: Comparison of USG findings with Histopathological findings of appendix.

DISCUSSION

The present study was conducted among 100 cases of patients with pain in right iliac fossa that reported to this hospital.

In this study 96 cases were between 12- 40 years of age. Only 4% cases were above 40 years of age. Mean age of the cases was 29.4 years with standard deviation of 10.3 years.A study by Regar MK et al, included clinically suspected 100 cases, with 91% patients in <40 years age group and 9% patients in ≥40 years.[7] Mean age of the patients was 24.86 years. In a study by Nanjundaiah N et al[8] 87% cases were below 40 year of age and 13% cases were above 40 years of age.

In this study 71 cases were males. Male to female ratio was 2.45:1. In a study, there were 61 males and 39 females in the study.[7] In a study, 61.6% were males and 38.4 were females.[8]

In this study, 100% had pain in the right iliac fossa. 84% and 89% cases had complained of anorexia and nausea, vomiting respectively. History of migratory RIF pain was given by 89% cases. Fever (elevated temperature >37.5°C), distension of abdomen and urinary complaints were present in 49%, 2% and 11% cases respectively.

In a study by, symptoms such as migration of pain to the RIF was present in 67% cases of acute appendicitis, anorexia in 93% cases, nausea and vomiting in 88%, and fever in 41% cases.[7] RIF pain was present in all the cases of acute appendicitis.

In this study of appendicitis, 82% cases had reported within 48 hthiss of appearance of symptoms. In 18% cases treatment was delayed for more than 2 days. In this study, RIF tenderness was present in all cases. In 87%

cases rebound tenderness was present. RIF guarding and Rovsing's sign were present in 11% and 31% cases respectively. In this study, leucocyte count was less than 10,000 in 24% cases. Neutrophil count was <75% in 14% cases. Urine analysis was abnormal in 7% cases.

In a study by Regar MK et al, signs such as RIF tenderness was present in all the 100 cases of acute appendicitis, rebound tenderness in 94% cases, guarding in 5% cases, Rovsing sign in 29% cases.[7]

RIPASA score of 7.5 or more is suggestive of surgical intervention for appendicitis. In this study, RIPASA score was less than 7.5 in 10% cases and it was indicative of surgical intervention in 90% cases.

In a study, out of 192 cases 116 (60.42%) had RIPASA score ≥7.5 and in remaining 76 cases the score was <7.5.[9]

Histopathology is the gold standard for confirmation of the diagnosis. Histopathological findings were grouped in to two categories - appendicitis and no appendicitis. Case having normal appendix was 1, grouped in to 'no appendicitis' group while remaining 99 cases with various types of appendicitis were grouped under 'appendicitis'.

In a study, histopathologically 95 patients were in appendicitis group and 5 patients were in no appendicitis group.[7] This study was comparable with this study.

In this study among the 99 appendicitis cases, the RIPASA score was suggestive of operative procedure in 90.9% cases. Among the one non appendicitis case, the RIPASA score was suggestive of operative procedure in none.

In this study the negative appendicectomy rate was nil for RIPASA score.

In this study of 100 cases, in 66 cases USG findings were suggestive of appendicitis while 34 cases were normal. Among the 99 histopathologically confirmed cases of appendicitis, USG was showing appendicitis in 65 (65.7%) cases while among the 1 histopathologically non appendicitis case, USG was positive in that case.

This study reveals that ultrasound provides reliable findings for the diagnosis of acute appendicitis in some cases. But the results were poor specifically for negative cases where as RIPSA scores show better results in positive as well as negative cases. These results emphasize again that a positive ultrasonography for appendicitis is in favthis of a diagnosis of acute appendicitis. However, a negative ultrasound is not sufficient to rule out the diagnosis of acute appendicitis.

CONCLUSION

The RIPASA score is efficient in the diagnosis of acute appendicitis. As compared with ultrasonography of abdomen and pelvis, the RIPASA score is more diagnostic in cases of acute appendicitis. Negative findings of acute appendicitis on ultrasonography of abdomen and pelvis are not the diagnostic test to rule out acute appendicitis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Bhatnagar SP, Chavan S. Evaluation of RIPASA score in the diagnosis of acute appendicitis. Int Surg J 2018;5:193-6.