



COMPARATIVE STUDY OF RIPASA AND ALVARADO SCORING SYSTEM IN DIAGNOSIS OF ACUTE APPENDICITIS IN TERTIARY CARE HOSPITAL.

General Surgery

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ABSTRACT

Introduction : Acute appendicitis is one of the most common surgical condition presents in casualty. Many clinical scoring systems developed in order to reduce negative appendectomy rates . Alvarado score is most commonly used world wide but surprisingly its accuracy in diagnosing in Asian population is low. So we compared RIPASA and Alvarado scoring system in diagnosis of acute appendicitis. **Materials and methods:** This study included 74 patients who presented to casualty with right iliac fossa pain and clinically diagnosed as acute appendicitis enrolled under the study after fulfilling inclusion and exclusion criteria. These patients were scored as per RIPASA and Alvarado scores and underwent appendectomy. Later histopathology reports of patients compared with these scores. Sensitivity , specificity, positive predictive value, negative predictive value and diagnostic accuracy were calculated. **Results :** Sensitivity and specificity of RIPASA score were 97% and 75%. Sensitivity and specificity of Alvarado score were 79% and 75%. Positive and negative predictive values of RIPASA were 98.5% and 60%, where as that of Alvarado score were 98% and 16% respectively. Diagnostic accuracy of RIPASA and Alvarado score were 96 % and 78% respectively. **Conclusion :** RIPASA score is better diagnostic scoring system than Alvarado score in diagnosing acute appendicitis in Indian population with high sensitivity and diagnostic accuracy.

KEYWORDS

Acute appendicitis, appendectomy .RIPASA, Alvarado

INTRODUCTION :

Acute appendicitis is one of the most common surgical emergencies, with lifetime prevalence rate of approximately one in seven¹. Different scoring systems have been developed for early diagnosis and management of acute appendicitis and to decrease negative appendectomy rates. These scoring systems includes history , clinical examination findings, laboratory findings. Alvarado scoring system is commonly used worldwide but its sensitivity and specificity significantly is low in Asian population^{2,3}. Raja Isteri Pengiran Anak Saleha Appendicitis (RIPASA) score includes more parameters than Alvarado and contain age ,gender and duration of symptoms prior to presentation. These parameters shown to affect specificity and sensitivity of Alvarado score⁴. We prospectively compared RIPASA and Alvarado scoring systems by applying to the patients who presented to casualty with right iliac fossa pain and diagnosed as acute appendicitis.

MATERIALS AND METHODS:

74 patients who presented to casualty, Victoria hospital from May 1 2022 to September 2022 included in this study. Inclusion criteria were patients of 18-60 years age group with right iliac fossa pain and suspected of acute appendicitis. Patients who under 18 years of age group, with features of peritonitis , right iliac fossa mass and those with pelvic inflammatory disease, urinary tract infection were excluded from study. All these patients were scored as per RIPASA and Alvarado scores. Alvarado score contains 8 parameters and RIPASA score contain 18 parameters. Scores were given by operating surgeon at the time of presentation based on history, clinical examination and laboratory findings. A cut off score of 7.5 is taken as high probability of acute appendicitis as per RIPASA and score of 7 as per Alvarado score. After surgery , all appendix specimens sent for histopathological examination. Later biopsy reports collected and correlated with both scoring systems. Data entered into MS office excel and analysed using SPSS version 20.0. Chi- square test used to compare qualitative data. Among 74 patients, 5 patients developed surgical site infection which required regular wound dressing.

Table no 1 : RIPASAScore

Sl. No	Parameter	Score
1	Female	0.5
2	Male	1.0
3	Age< 39.9 years	1.0
4	Age> 40 years	0.5
5	RIF pain	0.5
6	Pain migration to RIF	0.5
7	Anorexia	1.0
8	Nausea & vomiting	1.0
9	Duration of symptoms <48 hours	1.0
10	Duration of symptoms >48 hours	0.5

11	RIF tenderness	1.0
12	Guarding	2.0
13	Rebound tenderness	1.0
14	Rovsing sign	2.0
15	Fever < 37 C or >39 C	1.0
16	Raised WBC	1.0
17	Negative Urine analysis	1.0
18	Foreign NRIC	1.0
	Total	17.5

Table no 2 : Alvarado score

Sl. No	Parameter	Score
1	Pain migration to RIF	1
2	Anorexia	1
3	Nausea and Vomiting	1
4	RIF tenderness	2
5	Rebound tenderness	1
6	Fever	1
7	Raised WBC	2
8	Shift of WBC to left	1
	Total score	10

Table no 3 : Demographic variables of patients

Demography	No of patients
Total	74
Male	45
Female	29
Age <40	56
Age > 40	18
Confirmed histology for acute appendicitis	70
Negative histology for acute appendicitis	04
Surgical site infection	05

Table no 4 : Distribution of patients according to RIPASA score

RIPASA score	No of patients	Percentage
< 7.5	05	6.8
> 7.5	69	93.2

Table no 5 : Distribution of patients according to Alvarado score

RIPASA score	No of patients	Percentage
< 7	16	21.7
> 7	58	78.3

Table no 6 : Qualitative analysis of both scoring systems

Alvarado	RIPASA		Total
	> 7.5	< 7.5	
>7	56	00	56
<7	13	05	18
Total	69	05	74

RESULTS

Total 74 patients included in the study, among them 45 were male and 29 were female. Sensitivity and specificity of RIPASA score at cut off of > 7.5 was 97% and 75% respectively. Sensitivity and specificity of Alvarado score at cut off of > 7 was 79% and 75%. Positive predictive value and negative of RIPASA score is 98.5% and 60%, where as that of Alvarado score is 98% and 16% respectively. Negative predictive value of RIPASA is significantly higher than Alvarado score. Diagnostic accuracy of RIPASA score is 96% where as that of Alvarado is 78%. Negative appendectomy rate for RIPASA score is 6.7% and for Alvarado score is 24.3% which is statistically significant.

Overall negative appendectomy rate is 5.4%. Only 5 patients developed surgical site infection. So our study showed that RIPASA score has higher sensitivity and diagnostic accuracy which is statistically significant (p value < 0.001) than Alvarado score in diagnosis of acute appendicitis in Indian population.

DISCUSSION

Acute appendicitis is one of the most common surgical emergency condition encountered by junior residents in casualty. Despite being common problem, its diagnosis in young females is difficult because certain conditions such as urinary tract infections and pelvic inflammatory disease present with similar signs and symptoms⁵. Early diagnosis and its prompt management necessary to prevent complications such as perforation, peritonitis. Radiological investigations such as computed tomography in making definite diagnosis of acute appendicitis has higher sensitivity 94% and specificity 95%⁶. But in majority of hospitals, CT machine won't be available also CT imaging will increase the cost of health infrastructure. Recent study suggested indiscriminate use of CT imaging may lead to detection of early low grade appendicitis and unnecessary appendectomies in a condition that would otherwise has resolved spontaneously with antibiotic therapy⁷.

Many scoring systems developed to diagnose acute appendicitis. Among them Alvarado score is commonly used world wide, which has good sensitivity and specificity when applied to western population^{8,9}. But in Asian population its sensitivity and specificity is significantly low^{2,3}. So a new scoring system called RIPASA scoring system devised which includes 18 parameters.

Our study has compared RIPASA and Alvarado scores in terms of sensitivity and specificity. In our study, RIPASA score correctly placed 97% of the patients who had acute appendicitis in high probability group where Alvarado score placed 79% of the patients in high probability group. Difference in diagnostic accuracy between two scoring systems is 18% which is statistically significant.

RIPASA score is useful, rapid diagnostic tool for acute appendicitis, particularly in casualty, since it requires only patients demographics, clinical findings and two laboratory investigations. So operating surgeon can quickly make decision by looking these parameter. Our study results are compared to study done by Chong¹⁰.

CONCLUSION

RIPASA score is better diagnostic scoring system than Alvarado score for diagnosing acute appendicitis, with high sensitivity and specificity. It is simpler scoring system which uses patient's clinical history, examination findings and minimal investigations which avoids unnecessary appendectomies and expensive imaging studies.

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