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COMPARING THE RIPASA SCORE WITH THE ALVARADO SCORE IN DIAGNOSING ACUTE APPENDICITIS IN PATIENTS ATTENDING AL-SHAHID AL-SADR GENERAL HOSPITAL

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ABSTRACT

Appendicitis is one of the most frequently experienced abdominal surgery. The acute appendicitis diagnosis is primarily in the form of symptoms and signs. Symptoms of acute appendicitis at an early stage of presentation overlap with other conditions that make the diagnosis a challenging task. The Alvarado score and RIPASA score allow for risk stratification of abdominal pain patients, which links the likelihood of appendicitis to recommendations for discharge, observation and surgery. This study aimed to compare between the Alvarado score and RIPASA score in the diagnosis of acute appendicitis in patients attending the Al-Shahid Al-Sadr general hospital in Baghdad/Iraq. The descriptive prospective study was carried on (50) patients of both sexes with an apparent clinical picture of acute appendicitis aged (19-59) years. Pregnant women were excluded from the study. Results showed that the sample mean age was 23±14 years. The Alvarado scoring system's sensitivity and specificity were 83% and 67% respectively, while the sensitivity and specificity of RIPASA scoring system was 95% and 67% respectively. It can be concluded from our study that the RIPASA score is currently a better diagnostic scoring system than the Alvarado score with higher sensitivity, specificity, positive prediction, negative prediction and diagnostic correctness.

KEYWORDS: Alvarado score, Ripasa score, Acute appendicitis.

INTRODUCTION

Appendicitis is one of the most common diagnoses of hospitalization in an emergency departments.[1]

Delayed appendectomy in order to improve its precision in the treatment of patients increases the risks of complications such as appendiceal perforation, fracture and sepsis. At around 20%–40%, the opposite is also true if the negative or needless appendicectomy rate is increased with reduced diagnostic accuracy.[2]

Higher negative appendicectomy rates are considered acceptable in order to decrease perforation incidence. Diagnostic accuracy can nevertheless be increased by using ultrasound and computed tomography imaging. While these routine practices can significantly increase the cost of health care.[3] The use of CT imaging with the help of unnecessary appendicectomies can spontaneously resolve appendicitis by antibiotic therapy.[4]

Clinical and laboratory-based scoring systems supported the diagnostics of acute appendicitis. The most commonly used score of Alvarado was once introduced in 1986 for pregnant women, but it was validated significantly in non-pregnant lady patients. At present, the modified Alvarado score is used, with six medical objects and two tests in labs, and 10 points in total.[6] Other scoring systems are shown in table (1).

Table (1): Clinical scoring systems used in the diagnosis of appendicitis in children.[5]

Alvarado Score (MANTREL5)
Pediatric Appeindidtis Score
Low Risk for Apperididtis Score (Kharbanda)
Lintula Score
Eskelhnen Score
Fenyo - Lindberg Score
Ohmarm Score
Otristian Score
RIPASA Score

Alvarado scoring system is the most popular one. This score has very good sensitivity and specificity when applied to the western population. Subsequently, when this scoring was applied to oriental populations, it showed relatively less specificity and sensitivity to diagnose cases with acute appendicitis. So, a new scoring system called the RIPASA scoring system which was a simple scoring system consisting of 14 fixed parameters,[7] is applied.

RIPASA Scoring system is the latest member of acute appendicitis scores, originating in India. The data from 312 were used solely to derive the score of four hundred adults and children with appendectomy who were retrospectively identified. Individual criteria (0.5,1,2) were fully weighted, based on probabilities and a group of surgeons. A threshold of 7.5 with a sensitivity of 88% and 67% of PPV and NPV, respectively, was 93% and 53%.[8] So, we did this research to find the more specific and sensitive score in the diagnosis of acute appendicitis.

PATIENTS AND METHODS

The current descriptive prospective study was conducted in the surgery Department at Al-Shahid Al-Sadr General Hospital on patients with acute appendicitis symptoms including abdominal pain, rebounding sensitivity, nausea, vomiting and fever. The age group ranged between (19-59) years, excluding pregnant females.

Patients' personal data and clinical tests were done, including the patient's initial evaluation using ABCDE, vital signs and conscious level, then the patientss local abdominal examination was performed.

Other data included complete blood count with differential WBCs count, ultrasonography, CT abdomen with contrast, Alvarado score and RIPASA score by putting patient data on both score systems, Alvarado score and RIPASA score, including when comparing the scores, to comply with all parameters.

The patient's outcome i.e whether patient discharge and follow up for one month or diagnosed as acute appendicitis is treated with appendicectomy.

The surgeon took decision without research opinion then follow up a patient who is discharged for one month for recurrent or increase the intensity of symptoms.

All cases did operation sent appendix for histopathology and diagnosis of appendicitis according to pathology.

All cases which are discharged and relive pain completely diagnosed as negative for appendicitis.

RIPASA scoring system

- < 5: Probability of acute appendicitis unlikely, observing the patient and repeated scoring after 1-2 hours, if reducing the score, the patient would be discharged, if increased scoring the patient would be treated according to the next level.
- 5-7: Low probability of acute appendicitis, observation, repeated scoring every 1-2 hours, patients need admission to be observed, and ultrasound should be done and must discuss surgeon.
- 7.5-11: Probability of acute appendicitis is high and referral to an on-call surgeon for admission, preparation for appendicectomy, if female patient ultrasound must be done to exclude other gynaecological causes of RIF's pain.
- 12: Acute appendicitis, then referral to a surgeon for admission and appendectomy must be done. So, RIPASA score > 7.5 is operated. RIPASA score < 0.7 can either be observed in the day ward or discharged with an early clinic review appointment or strict follow up for the patient.[8]

Alvarado scoring system

- Alvarado score 1-4: discharge of patient.
- Alvarado scores 5-6: Admission and observation of the patient.
- Alvarado scores 7-10: surgery.[9]

Table (2): RIPASA score.

	Score
1. Patients:	
Female	0.5
Male	1.0
Age < 39.9 years	1.0
Age > 40 years	0.5
2. Symptoms	
RIF Pain	0.5
Pain Migration to RIF	1.0
Anorexia	1.0
Nausea & Vomiting	1.0
Duration of Symptoms > 48 hrs.	0.5
3. Signs	
RIF Tenderness	1.0
Guarding	2.1
Rebound Tenderness	1.0
Rovsing Sign	2.1
Fever > 37 C < 39 C	1.0
4. Investigation	
Raised WBC	1.0
Negative Urine Analysis	1.0
5. Additional Score	
Foreign NRIC	1.0
Total score	17.5

Table (3): Alvarado scoring system.

Alvarado score	
Symptoms	
Abdominal pain that migrates to the right iliac fossa	1
Anorexia (loss of appetite) or ketones in the urine	1
Nausea or vomiting	1
Tenderness in the right iliac fossa	2
Signs	
Rebound tenderness (Blumberg	1
Fever of 37.3 C or more	1
Laboratory	
Leukocytosis > 10,000	2
Neutrophilia > 70%	1
TOTAL	10

Statistical analysis

Data analysis was done using the software version SPSS 20. Chi-square, t and oneway ANOVA, with the least essential difference tests were used. In the comparison of categorical variables, Chi-square and non-parametric tests were used. For meaningful results, the value of P was set to < 0.05.

RESULTS

We conducted this study on 50 patients, 31 males and 19 females presented to emergency department with RT iliac fossa pain. When we put patients on Alvarado score which reveal 14 cases discharged in the first grades of score, and 10 cases returned after symptoms have been increased with further home assessment in 3 days and delayed appendectomy followed by 21 cases subjected to observation and admission followed by operation in the second grade of the score and 15 cases had undergone appendectomy.

Table (4): Total score for the patients studied in Alvarado (50 cases).

Total score	No	%
1-4: discharge	14	28%
5-6: observation, admission:-	31	62%
-Surgery after observation	21	42%
-Discharge then delayed appendectomy (within three days of presentation)	10	20%
-Discharge, recovery after admission	0	0 %
7-10: surgery	15	30%

Table (5): RIPASA total score among the studied population (50 cases).

Total score	No	%
< 5: low probability of acute appendicitis	5	10%
5-7: low probability of acute appendicitis! observation, US, admission:-	10	20%
-Surgery after observation	8	16%
-Discharge after observation	4	
-The discharge then returns for delayed appendicectomy (within three days from presentation)	2	4%
7.5-11: high probability of acute appendicitis, referral to a surgeon for admission, repeated scoring every 1-2 hours, US is done and if still increasing: surgery	21	42%
12: definite acute appendicitis	14	28%

Table (6): Final pathological diagnosis of cases (50 cases, 46 cases and 4 cases are discharged).

Final diagnosis by pathology		No	%
Positive cases		**41**	**82%**
1-Acute appendicitis	Acute catarrharal appendicitis	16	32%
	Acute suppurative appendicitis	13	26%
2-Complicated appendicitis	Gangrenous appendicitis	3	6%
	Gangrenous appendix with perforation	3	6%
	Gangrenous appendix with abscess formation	2	4%
	Acute on top of chronic appendicitis	4	8%
Negative appendicitis (normal)		**5**	**10%**
Total number of cases		46	92%

Table (7): Distribution of patients according to Alvarado and RIPASA scores (50 cases).

	Alvarado score	RIPASA score
True +ve	34	39
False +ve	3	3
True –ve	6	6
False –ve	7	2
Total	50	50

Table (8): Comparison between Alvarado and RIPASA scoring systems.

	Alvarado	RIPASA	P
Sensitivity	83	95	0.04
Specificity	67	67	0.68
Positive predictive value	92	93	0.69
Negative predictive value	46	75	0.03
Diagnostic accuracy	80	90	0.50

DISCUSSION

The inflamed appendix is one of the leading surgical crises, with a life-long prevalence of approximately one in seven. A negative appendicectomy was taken as a procedure performed in a typically histopathological sample for a preoperatory examination of appendicitis.

Different techniques were used to reduce the negative appendicectomy rate in dubious cases.[9]

This research included 50 patients with their age between 19 to 59 years old with a mean of 23±14 years, 31 males and 19 patients are females with the exclusion of pregnant females which is agreed with Barrett ML Among patients between 5 and 40 years of age, discussed acute appendicitis. It showed that the median age was 28, targeting males among rural income not excluding kids.[1]

Our study compared sensitivity and specificity between the Alvarado scoring system with that of RIPASA. The sensitivity and specificity of the Alvarado scoring system were 83% and 67% respectively. The sensitivity and specificity of the RIPASA scoring system were 95% and 67% respectively. The positive predictive value and negative predictive value of the Alvarado score is 92% and 46% respectively. The positive predictive value and negative predictive value of RIPASA score is 93% and 75% respectively. The diagnostic accuracy of RIPASA score is 90% which is higher than that for the Alvarado score, which is 80%. The difference is statistically highly significant between Alvarado and RIPASA scoring systems.

Chong CF applied RIPASA on 400 patients' adults and children who had appendectomy done already resulting in RIPASA sensitivity was 88%, specificity was 67%, PPV was 93%, NPV was 53% and diagnostic accuracy was 81%.[10]

By comparing RIPASA and Alvarado scoring systems in terms of diagnostic accuracy for patients with acute appendicitis. Both RIPASA and Alvarado score systems were equally able to decrease the negative appendicectomy rate significantly. However, RIPASA score was sensitive and accurate in diagnosing acute appendicitis and more able to identify a significant proportion of patients who would be missed by Alvarado score if applied to them.[11]

The same study was done among Indian population could have acute appendicitis, comparing RIPASA score and Alvarado score in diagnosing those patients revealing that RIPASA score has better diagnostic accuracy and sensitivity than Alvarado score.[12]

Determining the usefulness of RIPASA score for the diagnosis of acute appendicitis using histopathology as a gold standard, RIPASA score at a total cut-off score of 7.5 is a useful tool to diagnose appendicitis. It is non-invasive and gives rapid results. It helps to make a prompt decision in suspicious cases of right iliac fossa pain.[13]

By comparing the performance statistics of the Alvarado score with CT scan in the evaluation of suspected appendicitis, it is concluded that An Alvarado score of 7 and above in males and nine and above in females had positive ratios not significantly different from those of CT scan. These patients (males with Alvarado score seven and above, females with Alvarado score nine and above) are of least benefit from CT evaluation. Evaluation by CT is of value mainly in patients with an Alvarado score of 6 or less in males and eight or less in females.[14] So, the RIPASA score is a useful tool for diagnosis of acute appendicitis, as it contains simple parameters that include clinical history, examination and two simple blood investigations. Unnecessary and expensive radiological investigations can be avoided by using RIPASA score and thus reducing health care expenditure.

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