

Clinical benefit of a diagnostic score in acute appendicitis

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Received:
7th December, 2017

Accepted:
15th July, 2018

Abstract:

Background: Clinical utility of a diagnostic score for decision making in acute appendicitis.

Objectives: To evaluate the efficacy of Modified Alvarado Scoring System (MASS) in acute appendicitis with correlation to histopathological diagnosis.

Study: Prospective and observational.

Setting: Department of Surgery and Pathology of Peoples University of Medical and Health Sciences Nawabshah and Ghulam Mohammad Mahar Medical College Sukkur.

Subjects: A total of 80 consecutive patients with suspected acute appendicitis enrolled during the study period.

Material & Methods: Structured and standardized history and clinical examination was collected in all patients with correlation to Modified Alvarado Scoring System. Once the decision of surgery was made then finally Modified Alvarado Scoring System was correlated with operative and histopathological findings.

Results: Out of total 80 patients, 56(70%) were male and 24(30%) female with male to female ratio of 2.3:1. Age ranged from 11 to 50 years, majority (52.5%) and (22%) were in second and third decades of life respectively. In group I, discharge home group there were 8(6.4%) patients so discharged on conservative treatment with follow up advise. In group II, observation group there were 22(17.6%) patients, amongst them 14 patients (11.2%) underwent immediate surgery because of increasing their score during close observation. In group III, immediate surgery group 50 patients (40%) underwent immediate appendicectomy.

Conclusion: Alvarado score is a simple method of increasing diagnostic accuracy in acute Appendicitis. The tested and existing score can be recommended as a standard tool for decision making in acute appendicitis. There is no room in diagnostic complacency in acute appendicitis even in modern day medicine. Still effort is needed to perfect our diagnostic armamentarium so that appendicectomy can be appropriately offered to our patients. Until we have a highly accurate diagnostic tool on which based next best strategy for minimizing errors and misjudgments perhaps is the institution of surgical audit and clinical practice.

Keywords: Acute appendicitis, Modified Alvarado Scoring System, histopathological findings of appendicitis

Introduction:

Acute appendicitis is the most common surgical illness. Patients presenting with suspected appendicitis pose a diagnostic challenge.¹ Since appendicitis remains a difficult diagnosis and physicians have long relied on clinical vignette to solve this ever-challenging problem.² With a

life time cumulative incidence of 8.6% and 6.7% for men and women respectively.³ Appendicitis is the most frequent abdominal emergency.^{4,5} The diagnosis of acute appendicitis is purely based on history, clinical examination and some laboratory and radiological techniques. This is because acute appendicitis can present in vari-

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Table-1: Modified Alvarado Score

Variables	Clinical features	Score
Symptoms	Migratory rif pain	1
	Anorexia	1
	Nausea/ vomiting	1
Signs	Tenderness rif	2
	Rebound tenderness rif	1
	Temperature elevation	1
	Extra signs: rovsing sign, cough test, rectal tenderness	1
Laboratory test	Leucocytosis	2
Total		10

Table-2: Age distribution

Age group	Number	%
11-20	44	51.7
21-30	19	24.1
31-40	10	14.2
41-50	7	9.89
Total	80	100

Table-3: Management of patients in correlation to mass

Group	No	%	Outcome
I	8	10	Sent home
II	22	27.5	Observation
III	50	62.5	Operated
Total	80	100	

Table-4: Operative and Histopathological Findings

Final diagnosis	No	%
Acute appendicitis	57	83.8
Normal appendix	7	10.3
Mesenteric adenitis	2	2.9
Meckel'	2	2.9
Total	80	100

ous ways and classical symptoms and signs and found in about half of all subjects.⁶ Since delayed operation supposedly leads to disease progression and ultimately many fold increased in morbidity and mortality.⁷ Surgeons have restored the approach of early surgery when the diagnosis is still uncertain for a while negative appendectomy rate ranging from 5%-25%.⁸ So long as operation is done within a sufficiently short interval after admission and the surgeon is involved in a sufficiently short interval after admission. Several scoring systems have been developed for supporting the diagnosis of acute appendicitis with excellent results and may be used as an

ideal diagnostic tool.⁹⁻¹⁴ Being user friendly and comprehensible to the clinician.^{2,9,11,12} Alvarado score is the most widely used clinical prediction tool to facilitate decision making.^{15,16} It is a 10 point scoring system for the diagnosis of acute appendicitis based on clinical signs and symptoms and a differential leukocyte count (table-I), easy to apply in emergency departments to rule in acute appendicitis. This study was undertaken to demonstrate that a clinical judgment remains valid in the diagnosis of acute appendicitis. We therefore designed such a study with the use of Alvarado score on the basis of work and evaluated in our set up in context to medical literature.

Material and Methods:

Ethical committee approval was obtained for this study. A prospective and randomized clinical trial based on 80 consecutive patients with the clinical diagnosis of acute appendicitis registered during the period of 15 months from June 2009 to June 2011. All the enrolled patients were collected by a surgical trainee who explained about study protocol and obtained a written informed consent. Every patient underwent a structured and standardized clinical assessment and leukocyte count in calculation to MASS and divided the scoring system in three groups G-I, G-II, G-III.

Results:

Out of total 80 patients, 56(70%)were male and 24(30%) female with male to female ration of 2.3:1. Age ranged from 11 to 50 years, majority (52.5%) and (22%) were in second and third decades of life respectively as shown in Table II. In group-I, discharge home group there were 8(6.4%) patients so discharged on conservative treatment with follow up advise. In group-II, observation group there were 22(17.6%) patients, amongst them 14 patients (11.2%) underwent immediate surgery because of increasing their score during close observation. In group-III, immediate surgery group 50 patients (40%) underwent immediate appendicectomy as shown in table III.

Discussion:

The early and accurate diagnosis of acute appendicitis still poses a challenging problem. Since delayed operation leads to disease progression and ultimately appendiceal rupture, which carries with it a many fold increase in morbidity and mortality. In 10.93% rate of exploration represents a good clinical performance because a rate of >15% is still considered acceptable.^{2,3,9} Surgeons should not be too eager to perform surgery to avoid negative appendectomy on histopathology. He should give adequate time for patient's history and clinical examination and possibly modified Alvarado scoring to avoid negative appendectomy. The limited availability of medical imaging technologies and confinement to a rural region make a clinical evaluation a primary diagnostic tool. The surgeon's pre-operative diagnosis is still a challenge and a routine histological examination of the excised specimen is advised in all resected specimen there is potential for over diagnosing acute appendicitis.

Periodic assessment of patients placed in a structured observation programme on the other hand is of proven value in the patient management.^{8,10} Therefore several diagnostic scoring systems like Ramirez, Teacher and Ohmann^{6,11,12} have been developed, characterized as non-invasive, understandable, user friendly and cost effective.^{2,4,8,10,12} Alvarado scoring system is very easy to apply and quick tool in emergency room to improve decision. Total 64 patients underwent appendectomy, out of which negative appendectomy rate was 10.93% which is consistent with other studies. The sensitivity was 85.3% that is parallel to other studies. The specificity was 75% that is similar to other studies. The positive predictive value was 94.1% that is comparable with other studies.

The results of this study suggest that clinical judgment can be prioritized and can lead to good clinical performance in the management of patients with suspected acute appendicitis with no significant increase in rates of complicated appendicitis and negative findings on appendectomy. Clinical scoring systems like Alvarado score and the one like MASS based on

clinical observation and critical re-evaluation of the clinical picture is the mainstay of diagnosis and in common usage to decrease negative appendectomy rate and to avoid the perforation and other complication of appendicitis.¹⁷

Conclusion:

Alvarado score is a simple method of increasing diagnostic accuracy in acute Appendicitis. This protocol based approach to suspect appendicitis is feasible. The tested and existing score can be recommended as a standard tool for decision making in acute appendicitis. There is no room in diagnostic complacency in acute appendicitis even in modern day medicine. Still effort is needed to perfect our diagnostic armamentarium so that appendectomy can be appropriately offered to our patients. Until we have a highly accurate diagnostic tool on which based next best strategy for minimizing errors and misjudgments perhaps is the institution of surgical audit and clinical practice.

Conflict of interest: None

Funding source: None

Role and contribution of authors:

Dr Ali Gohar Bozdar, collected the data, references and did the initial write up.

Dr Dharmoon Arija, collected the data and helped in introduction writing

Dr Noor Ahmed Shaikh, review the article and advised useful changes in the article

Dr Imamuddin Baloch, critically review the article and made further changes

Dr Jan Muhammad Memon critically review the article and made the final changes.

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