Original Research Article

The early diagnosis of Acute appendicitis: evaluation of the reliability of MAS

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Abstract

Aim: To compare and evaluate diagnostic accuracy of Modified Alvarado score in co-relation to histopathology report for diagnosis of acute appendicitis.**Materials and methods:** This Cross Sectional Study evaluated 100 patients with complaint of Lower Abdominal pain. Subjects in the age range of 15 - 50 years hospitalized with abdominal pain suggestive of acute appendicitis were include towards the success of the study. **Results :** Histopathological diagnosis was accepted as the final confirmation of the diagnosis.Though large number of consultants were involved in clinical diagnosis of acute appendicitis, no significance was attached to the inter observer variation.**Conclusion:** The study concludes that establishing diagnosis in cases of suspected acute appendicitis might require a combination of different diagnostic tools such as modified Alvarado score, investigative modalities such as ultrasonography and the indispensible clinical judgment.

Keywords: Acute abdomen, appendicitis, alvarodo scoring, acute surgical abdomen.

Introduction

The acute surgical abdomen an important problem facing surgeons. The wide range of cause and varied patient presentation pose a formidable diagnostic and therapeutic challenge. As with all new developments however, enthusiasm for the new and modern techniques has sometimes over whelmed good clinical judgment Acute appendicitis is the most common cause of acute surgical abdomen with a life long risk of 7% [1]. Classic clinical and laboratory findings usually allow for prompt diagnosis and treatment However some patients have atypical and frequently confusing presentation leading to misdiagnosis.Diagnosis of Acute Appendicitis remains challenging despite improvement in history taking, clinical examination, new computer aided decision support system, clinical diagnostic sourcing and new imaging technique.

Diagnostic scores are useful and easy methods which help in surgical decision to reach. These scores make use of clinical, analytical and radiological findings to produce a rationalized model of clinical decision-making. Presently several such diagnostic scoring system have been proposed to aid diagnosis of acute appendicitis. The description of modified Alvarado scoring system was introduced in 1994 has greatly improved ability to diagnosis [4].

Plain abdominal films and barium studies considered to be of limited value. New technology could lower the rate of delayed diagnosis. Graded compression ultrasonography in diagnosis of acute appendicitis has greatly improved the ability to diagnose acute appendicitis with ultrasound [5]. Ultrasonography is critically operator dependant, and care to be taken to avoid over interpreting a technically in adequate examination. Graded compression sonography plays an important role in reducing the number of negative surgical exploration for acute appendicitis. The accuracy offered by sonography should keep negative laprotomy ratio at approximately 10% which is improvement over the rate achieved by instinct alone [6]. CT scan is complimentary to sonography. However CT scan is associated with greater cost, exposure ionizing radiation and exposure to contrast agents. In our hospital acute appendicitis remains one of the most common acute Abdominal emergencies warranting surgery in patients presenting with atypical clinical finding. So diagnosis has become difficult. Modified Alvarado scoring system plays a definite role in diagnosis of acute appendicitis. Hence this study is undertaken to compare and evaluate diagnostic accuracy of Modified Alvarado score (MAS) in co-relation to histopathology report for diagnosis of acute appendicitis

Materials and Method

The present observational study was conducted at Department of General Surgery, at Vardhman Institute of Medical Sciences, Pawapuri. The study was approved by institutional research and ethical research committee. Informed consent was taken from all the participants after explaining the study protocol. The study was conducted over a period from July 2021 to September 2021.The study sample consisted of 100 patients with complaint of Lower Abdominal pain visiting our hospital. Patients whoever satisfy the study criteria will be included in the study.

Inclusion criteria

1. Patients hospitalized with abdominal pain suggestive of acute appendicitis.
2. Age range of 15 - 50 years

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3. Both males and females
4. Ability to understand and give consent

Exclusion criteria

1. Patients less than 15 years of age and older than 50 years.
2. Patients who have underwent Appendicectomy previously.
3. Chronic/Subacute/Recurrent Appendicitis

Data including age, sex, symptoms, physical sings and laboratory findings such as white blood cell total and differential count were recorded in modified Alvarado form Urine for routine examination (R/E) was done for all cases.

Plain X-ray Kidney-Urinary bladder (KUB) region was done in selected cases. Ultra-sonogram (USG) of abdomen was performed when diagnosis was doubtful, especially in female patients to exclude gynecological disease.

The diagnosis of acute appendicitis was made clinically and the decision for appendicectomy was taken by the qualified surgeon. Subsequently, the score of each patient was correlated with the clinical, operative and histopathological findings.

Table 1: Shows Clinical Features and Scores

Clinical Features		Scores
Symptoms	Migratory right Iliac Fossa pain	1
	Anorezia	1
	Nausea/Vomiting	1
Signs	Tenderness in Right Iliac Fossa	2
	Rebound Tenderness	1
	Evelated Temperature	1
	Extra sign (s), e.g. cough test and/or Rovsing's sign and/or rectal tenderness	1
Laboratory	Leucocytosis	2
Total Score		10

Modified Alvarado score more than or equal to 7 are considered acute appendicitis i.e. positive and scores less than or equal to 6 are considered negative. The appendix specimen is sent for histopathology report and the report is noted. Histopathological diagnosis is considered as final. The modified Alvarado score and ultrasonography findings are compared to histopathology report.

When a positive modified Alvarado score case has histopathological positive report, the cases are considered as true positive and the modified Alvarado score negative cases are considered as true negative.

Histologically negative cases among modified Alvarado score positive cases are false positive and histologically positive cases among modified Alvarado score negative are false negative cases.

Results

Before analysis of data certain assumption were made. Histopathological diagnosis was accepted as the final confirmation of the diagnosis. Though large number of consultants were involved in clinical diagnosis of acute appendicitis, no significance was attached to the inter observer variation.

Table 2: Sex Distribution

Sex	No. of Patients
Male	74
Female	26

Table 3: Age Distribution

Age	No. of patients
15-20	28
21-30	55
31-40	13
41-50	4

Table 4: Histopathological Findings

HPE Positive	HPE Negative
74	26

Table 5: Modified Alvarado score

Modified Alvarado Score	No. of Patients
>/= 7	62
</= 6	38

Table 6: Statistics A

Alverado Score	Histopathological Findings	
	Positive	Negative
Positive	A (True Positive)	C (False Negative)
Negative	C (False Negative)	D (True Positive)

Table 7: Statistics B

Alverado Score	Histopathological Findings	
	Positive	Negative
Positive	64	25
Negative	10	3

Discussion

The diagnosis of acute appendicitis continues to be difficult due to variable presentation of the disease and lack of reliable diagnostic test. History and clinical examination provide useful information regarding diagnosis but even than different possibilities are there. These days the diagnosis of appendicitis is mainly clinical.

The surgeon is the best person who decides the best management in cost effective manner, of course the more experienced the surgeon is more will be the diagnostic accuracy. But the junior surgeon has to make the initial assessment and decision to operate or no. Thus there is need of a complementary aid in difficult decision. Different diagnostic aids have appeared recently and among these laparoscopy and ultrasonography have shown good results, but they also have limitation and drawback [2]. Clinical scoring systems have proved useful in management of number of surgical condition. In past few years various scores have been developed to aid the diagnosis of acute appendicitis.The Alvarado score is simple scoring system that can be instituted easily the Alvarado score was modified by Kalen and proposed modified Alvarado score.The present study has shown better sensitivity, as it is a cross sectional study and short comings of retrospective study are ruled out like good documentation is needed, lack of recording of modified Alvarado score may indicate in complete recording in case notes of some patients rather than true absence of modified Alvarado score finding. Modified Alvarado scoring system is a dynamic one allowing observation and critical evaluation of the clinical picture. Its application improved diagnostic accuracy and reduces negative exploration and complication rates. Thus modified Alvarado score is a useful tool in clinical decision making especially when ultrasonography is unavailable. As imaging technique are considered to be expensive in India, Scoring system should be used in selection of patients for further work-up.

Conclusion

Acute appendicitis is the most common acute abdominal condition necessitating surgery. There is high prevalence among young age in adults. Diagnosis of acute appendicitis remains challenge. Although ultrasonography is method used frequently for diagnosis of acute appendicitis, using modified Alvarado score is a useful tool in clinical decision making. As modified Alvarado score is simple, easily applicable in peripheral hospitals where back up facilities are sparse. It can be useful for junior doctors in patients of abdominal emergencies. Thus we conclude that establishing diagnosis in cases of suspected acute appendicitis might require a combination of different diagnostic tools such as modified Alvarado score, investigative modalities such as ultrasonography and the indispensible clinical judgment.

Conflict of Interest: Nil
Source of support:Nil

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