



EVALUATION OF MODIFIED ALVARADO SCORING SYSTEM IN ACUTE APPENDICITIS

Surgery

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ABSTRACT

BACKGROUND: Acute Appendicitis is the most frequent surgical emergency encountered worldwide. This study was conducted for evaluation of modified alvarado scoring system in diagnosing Acute Appendicitis.

OBJECTIVES: The aim of the study is to evaluate the efficacy of modified alvarado scoring system as a diagnostic tool to aid early and accurate diagnosis of Acute Appendicitis.

METHODS: This was a prospective study conducted in Government Dharmapuri Medical college Hospital from 2015 to 2016. It included 120 cases of suspected Acute Appendicitis admitted in our hospital during that time.

RESULTS:

Modified Alvarado scoring system , sensitivity is 84.26%, specificity 10.83%, positive predictive value 84.26%. Negative appendectomy rate was 2.87%. Missed Appendicitis rate 2.5%.

CONCLUSION:

Modified Alvarado scoring system had a diagnostic accuracy of 97%, seems to be ideal for supporting the diagnosis of Acute appendicitis, because it is non-invasive, doesn't require specific equipments.

KEYWORDS:

Acute appendicitis, Modified Alvarado scoring system.

INTRODUCTION

Acute appendicitis remains one of the most common surgical diseases encountered. When appendicitis manifests in its classical form it is easily diagnosed & treated. Unfortunately these classic symptoms occur in one half of patients with acute appendicitis. Accurate & timely diagnosis of atypical appendicitis remains clinically challenging and one of the most commonly missed problems in the emergency department. Furthermore the consequence of missing appendicitis thus leading to perforation significantly increases morbidity & prolongs hospitalization.

AIM OF STUDY

To evaluate the value of MODIFIED ALVARADO SCORING SYSTEM (MASS) as a diagnostic tool to aid early and accurate diagnosis of acute appendicitis.

MATERIALS AND METHODS

A prospective study was conducted from 2015 to 2016 in patients admitted with suspected acute appendicitis in the surgical wards of Govt. Dharmapuri Medical college medical college hospital.

Patients with suspected acute appendicitis were assessed by Modified Alvarado scoring system.

Age group comprised of 10 years to 70 Years. Both sexes were included. Patients included in the study were Haemodynamically stable without any concurrent illness. Thorough clinical examination was done along with total leucocyte count.

SCORING SYSTEM

THE MODIFIED ALVARADO SCORE

SYMPTOMS:

- 1. Migrating right iliac fossa pain : 1
- 2. Anorexia : 1
- 3. Nausea / Vomiting : 1

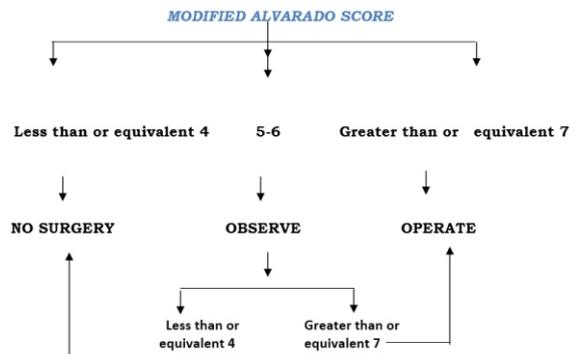
SIGNS:

- 1. Tenderness –right iliac fossa : 2
- 2. Rebound tenderness : 1
- 3. Elevated Temperature : 1

LABORATORY TEST:

- Leukocytosis : 2

TOTAL SCORE : 9



Discussion:

- Total No of patients with suspected appendicitis : 120
- Patients with score > 7 : 98
- Patients with Score 5-6 : 10

Patients with < 4 : 12
 No. of Patients whose score increased to > 7 During Period of: 6 observation
 No. of patients whose score decreased to < 4 during Period of: 6 observation
 No. of patients whose score decreased to < 4 during Period : 4 of observation
 No. of Patients who underwent Appendicectomy : 104
 No. of Patients who did not undergo Appendicectomy : 16
 Histopathologically positive Appendicitis : 101
 No. of patients who had normal Appendix : 3
 Patients with Score < 4 but developed Appendicitis : 3

	Appendicitis (HPE +ve)	Normal appendix	Total
+ve	101	3	104
-ve	3	13	16
Total	104	16	120

Sensitivity of the Test = $101 / 120 \times 100$
 = 84.26%
 Specificity of the Test = $13 / 120 \times 100$
 = 10.83%
 Positive Predictive Value = 84.26%
 Negative Appendicectomy Rate = $3 / 104 \times 100$
 = 2.8%
 Missed appendicitis Rate = $3 / 120 \times 100$
 = 2.5%

RESULTS FOR MALE PATIENTS

	Appendicitis (HPE +ve)	Normal appendix	Total
+ve	52	1	53
-ve	1	6	7
Total	53	7	60

Sensitivity of the Test = $52 / 60 \times 100$
 = 86.66%
 Specificity of the Test = $6 / 60 \times 100$
 = 10.0%
 Positive Predictive Value = 86.66%
 Negative Appendicectomy Rate = $1 / 53 \times 100$
 = 1.8%
 Missed appendicitis rate = $1 / 60 \times 100$
 = 1.6%

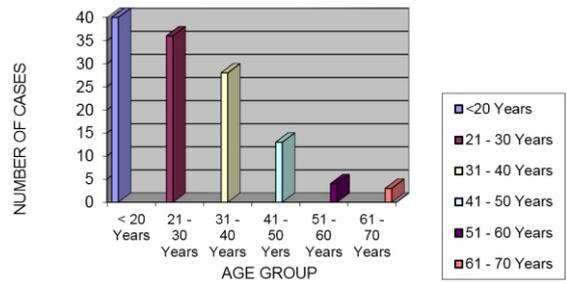
RESULTS FOR FEMALE PATIENTS

	Appendicitis (HPE +ve)	Normal appendix	Total
+ve	49	2	51
-ve	2	7	9
Total	51	9	60

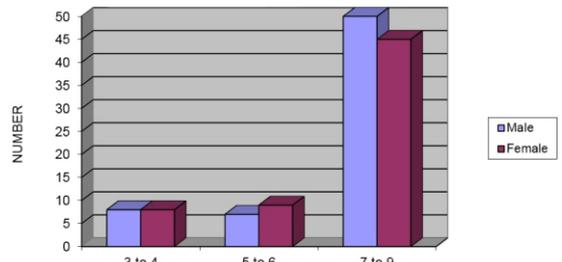
Sensitivity of the Test = $49 / 60 \times 100$
 = 81.66%
 Specificity of the Test = $7 / 60 \times 100$
 = 11.66%
 Positive Predictive Value = 81.66%
 Negative appendicectomy Rate = $2 / 51 \times 100$
 = 3.9%
 Missed appendicitis Rate = $2 / 60 \times 100$
 = 3.3%

MODIFIED ALVARADO SCORING SYSTEM CHARTS

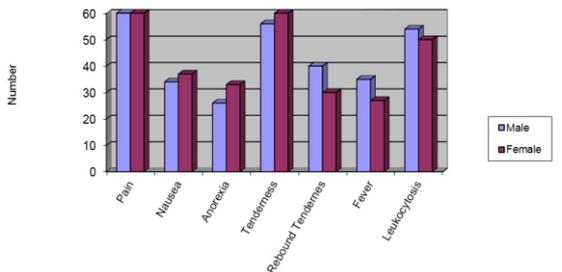
Age wise distribution



MODIFIED ALVARADO SCORING SYSTEM
Alvarado scoring Vs number of cases

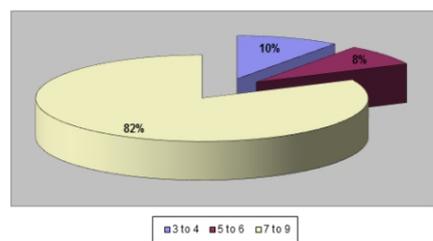


MODIFIED ALVARADO SCORING SYSTEM
Variables Vs number of cases



MODIFIED ALVARADO SCORING SYSTEM

MODIFIED ALVARADO SCORE



DISCUSSION

Clinical Scoring systems have proved useful in the management of number of surgical conditions. In the past few years various scores have been developed to aid the diagnosis of acute appendicitis. Although many diagnostic scoring have been described, those are difficult to implement in the clinical situations. The modified Alvarado score, is a simple scoring system that can be instituted easily.

Our study demonstrates that Modified Alvarado score is substantially superior in diagnosis of Acute Appendicitis in adult with a sensitivity of 84.26% and a specificity of 10.83%. For male patients sensitivity of 86.66%, specificity of 10.0%. For female patients sensitivity of 81.66%, specificity of 11.66%. The Alvarado score is both simple to remember and to use. This Scoring system seems ideal for the diagnosis of Acute Appendicitis because it is non-invasive,

requires no special equipment and can be easily used by a JUNIOR RESIDENT as clinical routine in a peripheral hospital.

Negative Appendectomy rate in this study is 2.8% where as in general the negative Appendectomy rate reported in literature is 15-30% thus it grossly reduces the negative Appendectomy rates.

In our study (98/120) 81.66% presented with a score of > 7 of the remaining 10 observed 4 had a score of > 7 within 6 hours and 2 within 12 hours. The remaining 5 persons who were observed did not have an increase in the score further. So 85% of Appendectomies can be clinically decided within first 6 hours.

Of the 12 who had a score of < 4, 3 developed acute appendicitis at a later date.

Missed Appendectomy rate is 2.5%. Better clinical experience and recent radiological investigation may reduce this value.

CONCLUSION

Modified Alvarado Scoring system with a diagnostic accuracy of 97% seems to be ideal for supporting the diagnosis of acute appendicitis because it is noninvasive, does not require special equipments, and is simple to remember, and use in a peripheral set up by a junior resident where radiological investigation are difficult to perform.

In conclusion Modified Alvarado scoring along with an abdominal and pelvic ultrasound may be the ideal tool to diagnose acute appendicitis in males.

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