



CLINICO-PATHOLOGICAL MODIFIED ALVARADO STUDY OF ACUTE APPENDICITIS WITH SPECIAL REFERENCE TO SCORING AND POST-OPERATIVE HISTOPATHOLOGY

General Surgery

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ABSTRACT

BACKGROUND: Acute appendicitis is the most common surgical cause of emergency laparotomy. Acute appendicitis can progress to perforation, which is associated with a much higher morbidity and mortality,

AIM AND OBJECTIVES To use clinical score in patients with pain in right iliac fossa in diagnosis and management of acute appendicitis. To find out sensitivity and specificity of scoring system. To correlate anatomical position of appendix pre operatively with various signs and tests. To study the incidence of normal appendix found during appendicectomy diagnosed as acute appendicitis.

MATERIAL AND METHOD: This study was carried out in the department of general surgery, VMMC, Safdarjung New Delhi, All patients with acute Right Iliac Fossa pain attending surgery department were subjected to clinical assessment by applying Modified Alvarado scoring system and various clinical tests in consultation with senior surgeon for diagnosis of acute appendicitis and admitted to surgery ward.

CONCLUSION: Acute appendicitis is most common emergency surgical abdomen in age group 21-30 yrs with higher male incidence i.e. in male adolescent. Anorexia and Tenderness in right iliac fossa, are most common variables of modified Alvarado score associated with acute appendicitis in the above age & sex group.

KEYWORDS

Acute appendicitis, emergency laparotomy,

INTRODUCTION

Acute appendicitis is the most common surgical cause of emergency laparotomy. Acute appendicitis can progress to perforation, which is associated with a much higher morbidity and mortality, and surgeons have therefore been inclined to operate when the diagnosis is probable rather than wait until it is certain.

The surgical principle about acute appendicitis *When in doubt, take it out*," is not correct in view of the number of major and minor complications following appendicectomy. Despite more than 100 years of experience, accurate diagnosis still evades the surgeon. Owing to its myriad presentations, acute appendicitis is a common but difficult diagnostic problem.

The accuracy of the clinical examination has been reported to range from 71% to 97% and varies greatly depending on the experience of the examiner. However, because missed ruptured appendix have dire consequences, surgeons have traditionally accepted a 20% rate of negative findings at appendectomy and the removal of a normal appendix. The rate of negative appendectomy (Removal of a normal appendix in patients with other causes of abdominal pain) is reported to be between 20% and 30%.

Appendicitis is most frequently found in their second through fourth decades of life with a mean age of 31.3 years and a median age of 22 years. There is a slight male to female predominance (M:F 1.2 TO 1.3:1)

One of every 15 persons in general population is said to develop acute appendicitis during their lifetime. The incidence of appendicitis in the elderly appears to be increasing, due to the longer life expectancy and increasing population of the elderly people. Acute appendicitis is commonly caused due to a variety of reasons namely difference in dietary habits, food adulterations, indulging in mixed diet habits, seasonal changes particularly colder periods. Acute appendicitis is prevalent among males and females irrespective of age factor but is noted in slightly large numbers among males and rarely found in infancy and old age. The etiology of acute appendicitis is plenty among which obstruction to lumen and infection play an important role. Of all the infections *E. coli* is found to be the most common organism which is responsible for acute appendicitis. The classical signs and symptoms of acute appendicitis were first reported by Fitz in 1886. Apart from classical presentation, appendicitis either presents with unusual features or associated with unusual condition presenting as

appendicitis. Acute appendicitis in pregnancy; Appendicitis is the most common surgical emergency occurring during pregnancy. Diagnosis is often difficult. Physical findings may be obscured or altered by the cephalad displacement of the appendix as pregnancy progresses. Delay in treatment may result in death of the foetus or both foetus and mother. Appendicitis in the elderly.

MATERIAL AND METHODS

This study was carried out in the department of general surgery, VMMC, Safdarjung New Delhi, All patients with acute Right Iliac Fossa pain attending surgery department were subjected to clinical assessment by applying Modified Alvarado scoring system and various clinical tests in consultation with senior surgeon for diagnosis of acute appendicitis and admitted to surgery ward. After admission to ward detailed history was taken regarding presenting complaints, their duration severity, sequence of onset of symptoms, mode of onset, progression, change in the pattern at the time of presentation and any atypical symptoms. Enquiry was made into family history suggestive of appendicitis, menstrual and obstetric history and past history of appendicitis.

INCLUSION CRITERIA:-

Patients of any age group and both sexes presenting to emergency department with symptoms suspected of acute appendicitis (1st attack of pain) and whose appendices were physically removed and subjected to histopathological examination.

EXCLUSION CRITERIA:-

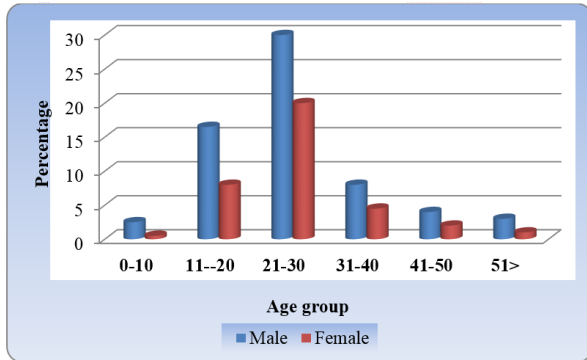
Recurrent appendicitis.
Appendicular mass.
Appendicular abscess
Peri-appendicitis because of Urological / Gynecological pathology.

Table I. showing Age and Sex Distribution of patients suspected with Acute Appendicitis under Modified Alvarado score

Age group (yrs)	Malen (%)	Femalen (%)	Totaln (%)
0-10	05(2.5)	01(0.5)	06(3)
11-20	33(16.5)	16(8)	49(24.5)
21-30	60(30)	40(20)	100(50)
31-40	16(8)	09(4.5)	25(12.5)
41-50	08(4)	04(2)	12(6)
51>	06(3)	02(1)	08(4)
Totaln (%)	128(64)	72(36)	200(100)

- **Figure in parenthesis indicates percentage. n- number of patients**

Graph I : Age and sex distribution of patients suspected with Acute appendicitis under Modified Alvarado score



- **Table I.** Shows the age and sex distribution of patients with acute appendicitis. Out of 200 patients 128 (64%) were males and 72 (36%) were females, with a male : female ratio of 1.7: 1. The maximum number of patients, 50% were in the age group of 21-30 years, followed by 24.5% patients in the age group of 11-20 years. The mean age of the study population was 26.75 years.

Table II. Showing Age wise Distribution of patients according to variables under Modified Alvarado score

Age group (yrs)	T P n(%)	Modified Alvarado score							
		M n (%)	A n (%)	N n (%)	T n (%)	R n (%)	E n (%)	L n (%)	
0-10	06 (3)	01 (0.5)	05 (2.5)	05 (2.5)	06 (3)	03 (1.5)	02 (1)	04 (2)	
11-20	49 (24.5)	32 (16)	46 (23)	41 (20.5)	47 (23.5)	15 (7.5)	32 (16)	38 (19)	
21-30	100 (50)	54 (27)	94 (47)	69 (34.5)	94 (47)	63 (31.5)*	69 (34.5)	67 (33.5)	
31-40	25 (12.5)	13 (6.5)	24 (12)	17 (8.5)	23 (11.5)	15 (7.5)	20 (10)	14 (7)	
41-50	12 (6)	8 (4)	12 (6)	9 (4.5)	12 (6)	05 (2.5)	08 (4)	07 (3.5)	
51 >	08 (4)	06 (3)	08 (4)	07 (3.5)	08 (4)	04 (2)	05 (2.5)	03 (1.5)	
Total	200 (100)	114 (57)	189 (94.5)	148 (74)	190 (95)	105 (52.5)	136 (68)	133 (66.5)	
P value	--	0.20	0.73	0.39	0.83	0.01	0.38	0.19	

Figure in parenthesis indicates percentage. *P ≤ 0.05 Significant TP - total number of patients, n- number of patients, M- migratory right iliac fossa pain, A- anorexia, N- nausea/vomiting, T- tenderness in right iliac fossa, R- rebound tenderness, E- elevated temperature, L- leucocytosis.

¥p<0.00 highly significant

- **Table II.** Shows that maximum number of patients 190 (95%) had tenderness in right iliac fossa. Next common symptoms observed were anorexia in 189 (94.5%) patients, and nausea /vomiting were in 148 (74%) patients. Tenderness in right iliac fossa was observed more in age groups 0-10 years (100%) and more than 41 years (100%). Anorexia is more common in the age groups > 41 years (100%). Comparison of age group 11- 20 with 21 - 30 there was highly significant value in rebound tenderness.

OBSERVATION AND RESULTS

The present study entitled CLINICO-PATHOLOGICAL STUDY OF ACUTE-APPENDICITIS WITH SPECIAL REFERENCE TO MODIFIED ALVARADO SCORING AND POST-OPERATIVE HISTOPATHOLOGY” was carried out in the department of general surgery, VMMC, Safdarjung New Delhi & NSMCH Bihta Patna, Two hundred patients with acute right iliac fossa pain were included in this study. The clinical details and investigations of patients were entered in proforma. All patients with right iliac fossa pain underwent clinical examination and Modified Alvarado scoring system was applied in all patients who presented with acute symptoms and clinically suspected to have acute appendicitis and was scored accordingly. Most cases

presented as acute appendicitis were operated on emergency basis, depending on severity of inflammation.

DISCUSSION

Acute appendicitis remains a common abdominal emergency throughout the world. Though there are lots of advances in the diagnostic field, with the invention of sophisticated investigations diagnosis of acute appendicitis remains an enigma for the attendant surgeon because none of them are either 100% sensitive or 100% specific. Even today a thorough clinical examination with basic investigation like WBC count remains cornerstone in the diagnosis of acute appendicitis. This inadequacy on the part of a surgeon is liable for making incomplete diagnosis, hence chance of negative appendectomy. With this background many eminent Surgeons & Physicians have been adopting different scoring systems in order to decrease negative appendectomy (Fenyo.G. 1987; Arnbjornsson E. 1985; Teicher et al, 1983)⁴⁷. We find the value of Alvarado score (Alvarado A. 1986) which was modified by Kalan et al 1994 for its routine use in clinical practice. The modified Alvarado score is simple to use and easy to apply, since it relies only on history, clinical examination and a basic laboratory investigation.

Alvarado scoring system. Majority of the patients in this study presented within 24 hrs after the onset of pain, with most of them between 12-24 hrs.

The present study was under taken to evaluate the usefulness of modified Alvarado scoring system in reducing the number of negative appendectomy and to evaluate the sensitivity of Modified Alvarado Scoring system in the diagnosis of acute appendicitis. The usefulness of the scoring system was demonstrated beyond doubt by reducing number of negative laparotomies.

SUMMARY

Age group the maximum number of patients, 100 (50%) were in the age group of 21- 30 years. The mean age of the study population was 26.75 years.

Sex out of 200 patients 128 (64%) were males and 72 (36%) were females, with a male : female ratio of 1.7: 1. Migratory right iliac fossa pain out of 200 patients migratory right iliac fossa pain was seen in 114 (57%) in them 73 (36.5%) were males and 41 (20.5%) were females.

The common age group was 21-30 years. Out of 114 (57%) patients with migratory right iliac fossa pain the most common histopathology report in them was inflammatory cells up to the muscularis with necrotic suppurative debris in the lumen 52 (26%).

Anorexia out of 200 patients 189 (94.5%) had anorexia in them 123 (61.5%) were males and 66 (33%) were females. The common age group was 21-30 years 94 (47%). The most common histopathology report in them was inflammatory cells up to the muscularis with necrotic suppurative debris in the lumen 64 (32%).

Nausea was seen in 148 (74%) in them 91 (45.5%) were males and 57 (28.5%) were females, with a common age group of 21-30 years 69 (34.5%). The common histopathological report was inflammatory cells up to the muscularis with necrotic suppurative debris in the lumen 54 (27%).

Tenderness in right iliac fossa was seen in 190 (95%) of patients in them 119 (59.5%) were males and 71 (35%) were females. The common age group was 21- 30 years 94 (47%). The most common histopathology report was inflammatory cells up to the muscularis with necrotic suppurative debris in the lumen 67 (33.5%).

CONCLUSION

Acute appendicitis is most common emergency surgical abdomen in age group 21-30 yrs with higher male incidence i.e. in male adolescent. Anorexia and Tenderness in right iliac fossa, are most common variables of modified Alvarado score associated with acute appendicitis in the above age & sex group. Majority of male adolescent on screening presented with score 8, clear cut case of acute appendicitis, despite there being long list of differential diagnosis.

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