ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
Index Copernicus Value: 49. 23
PubMed - National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 3, Issue –4, August - 2018, Page No. : 93 - 96

Evaluation of Modified Alvarado Score in Diagnosis of Acute Appendicitis at Tertiary Care Hospital in Western Rajasthan

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background- Acute abdominal pain is a common complaint among emergency department patients.

Methods- A 100 consecutive patients suspected of acute appendicitis who were admitted in department of surgery, Sardar patel medical college & AGH, Bikaner, Rajasthan. They were prospectively evaluated using the modified Alvarado scoring (MAS) to determine whether or not they had acute appendicitis.

Result - In present study, out of total 100 patients 78(78%) were have MAS score 7-9, 20% were have 5-6 and 2% have MAS score 1-4.

Conclusion- The study shows that use of MASS in patients suspected to have acute appendicitis provides a high degree of diagnostic accuracy.

Keywords- Modified Alvarado Score (MAS), acute appendicitis, Patients.

Introduction

Acute abdominal pain is a common complaint among emergency department patients. Diagnostics of one of the most common pathologies behind acute abdominal pain, acute appendicitis, has radically changed over the last decades. Traditionally, the diagnosis of appendicitis was made solely based on clinical symptoms and signs, and later diagnosis included results of inflammatory laboratory variables such as leukocytes, neutrophils, and CRP. This practice in diagnostics led to a false positive diagnosis (negative appendectomy) rates in the range of 15-30% [1-3]. The diagnosis of acute appendicitis is essentially clinical; however a decision to operate based on clinical suspicion alone can lead to removal of a normal appendix in 15-30% cases. The premise that it is better to remove a normal appendix than to delay diagnosis doesn't stand up to close scrutiny, particularly in the elderly. A number of clinical and laboratory based scoring systems have been devised to assist diagnosis. The most commonly used is the Alvarado score and equally its modifications[4].

Material and Methods

Study design: Hospital based prospective study.

Study duration: 18 months.

Study place: Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Study population: patients presenting with pain in the right lower quadrant of Abdomen, lasting fewer than 7

days who after clinical examination will be provisionally diagnosed to have acute appendicitis.

Sample size: 100 patients reporting to the Surgery dept. within study duration and eligible as per inclusion criteria will be included in the study.

Sampling Method: Convenience sampling

Inclusion Criteria

Patients with provisional clinical diagnosis of acute appendicitis

Exclusion Criteria:

1. Patients of age less than or equal to 12 years
2. Patients with generalized peritonitis due to appendicular perforation
3. Patients with Appendicular mass or abscess

Data Collection

Suspect acute appendicitis that were admitted, investigated and treated was taken for the study. After detailed examination and investigations a modified Alvarado score was applied to each case.

Modified Alvarado Score

This consists of three symptoms, three sign and a laboratory finding as described by Alvarado and later modified by Kalan et al[5].

All patients were subject to USG. Ultrasonographic criteria will be:

- Non compressible appendix with diameter > 6 mm or wall thickness > 3mm
- Complex mass (echo poor, asymmetric)
- Loss of contour
- Free fluid
- Local adynamic ileus
- Graded tenderness over McBurney's point

Other biochemical tests like Hb, BT, CT, TLC, DLC, Urine C/E, FBS, Blood urea, Serum creatinine, ECG etc. will be done, if required. Surgical exploration if needed was done. Surgical findings were recorded and compared with Alvarado score findings and USG findings. All appendices remove will be sent for histopathology. If pathologist reports no evidence of acute inflammation in the organ, the case will be designate as false positive Appendisectomy. Sensitivity and specificity of modified Alvarado score and USG was calculate separately and after combining both modalities together and will be compare with available literature.

Data Analysis

To collect required information from eligible patients a pre-structured pre-tested Proforma will be used. For data analysis Microsoft excel and statistical software SPSS will be used and data will be analyzed with the help of frequencies, figures, proportions, measures of central tendency, appropriate statistical test.

Observations

The present study was undertaken to evaluation of modified alvarado score and ultrasonography for the diagnosis of acute appendicitis at tertiary care Hospital in Western Rajasthan in Dept. of general Surgery, S.P. Medical College, Bikaner. This study was conducted on total 100 number of patients.

Table-1: Distribution of cases according to Age (N=100 cases)

Age group (years)	No.	Percentage
13-20 years	16	16%
21-30 years	34	34%
31-40 years	28	28%
41-50 years	12	12%
51-60 years	8	8%
>60 years	2	2%
Total	100	100%
Means age (years)	30.20	
SD	11.57	

In present study, maximum 34% patients belonged to age group was 21-30 years followed by 28(28%) in 31-40 age group, 2 (2%)cases in >60yrs age group.

Table-2: Distribution of cases according to Symptoms (N=100 cases)

Symptoms	No.	Percentage
Migration of pain to Right iliac fossa	94	94%
Anorexia	96	96%
Nausea and vomiting	88	88%

In present study, out of total 100 patients 96(96%) were presenting with anorexia, 94% presenting with Migration of pain to right iliac fossa and 88 % presenting with nausea and vomiting.

Table-3: Distribution of cases according to Sign (N=100 cases)

Sign	No.	Percentage
Tenderness in right iliac fossa	96	96%
Rebound tenderness	86	86%
Elevated temperature >37deg C	76	76%

In present study, out of total 100 patients 96(96%) were presenting with Tenderness in right iliac fossa, 86% presenting with Rebound tenderness and 86 % presenting with Elevated temperature >37deg C.

Table-4: Distribution of cases according to lab. Investigation (N=100 cases)

Lab . Investigation	No.	Percentage
Leukocytosis present	84	84%
Leukocytosis absent	16	16%

In present study, out of total 100 patients 84(84%) were present with leukocytosis.

Table-5: Distribution of cases according to Modified Alvarado Scoring (N=100 cases)

Modified Alvarado Scoring(MAS)	No.	Percentage
1-4	2	2%
5-6	20	20%
7-9	78	78%

In present study, out of total 100 patients 78(78%) were have MAS score 7-9, 20% were have 5-6 and 2% have MAS score 1-4.

Discussion

In present study, maximum 34% patients belonged to age group was 21-30 years followed by 28(28%) in 31-40 age group, 2 (2%)cases in >60yrs age group.

Similar study has been done by Harsha et al.[6] In their study maximum incidence of acute appendicitis was found in the age group of 21 to 30 years , while Talukder et al[7] showed high incidence in third decade .

In present study, out of total 100 patients 54(54%) were from rural area and 46 (46%) were from urban area. The study conducted by Harsha et al[6] was found that 62% were from rural area and 38 were from urban area.

In present study, out of total 100 patients 96(96%) were presenting with anorexia, 94% presenting with Migration of pain to right iliac fossa and 88 % presenting with nausea and vomiting.

Vandakudri AB et al [8] was observed that the predominant symptom was anorexia (71.7%), the next common symptom being nausea/ vomiting (63.3%) and migration of pain to right iliac fossa (53.3%).

Appendicitis needs to be considered in the differential diagnosis of almost every patient with acute abdominal pain[9]. Early diagnosis remains the most important goal in these patients and is made in most cases based only on history and clinical examination. The typical presentation begins with periumbilical pain due to irritation of visceral nerves. Followed by anorexia and nausea. The pain then localizes to right lower quadrant as inflammatory process

involves parietal peritoneum overlying appendix. Fever ensues, followed by development of leukocytosis.

In present study, out of total 100 patients 96(96%) were presenting with Tenderness in right iliac fossa, 86% presenting with Rebound tenderness and 86 % presenting with Elevated temperature >37deg C.

Vandakudri AB et al [8] was observed that The predominant sign was tenderness over RIF (75.8%). The next common sign was elevated temperature >37.3°C (68.3%) and rebound tenderness over RIF (46.7%).

In present study, out of total 100 patients 84(84%) were present with leukocytosis. Similar study was done by Thabit et al [10]. In his study87% were present with leukocytosis.

In present study, out of total 100 patients 78(78%) were have MAS score 7-9, 20% were have 5-6 and 2% have MAS score 1-4. Similar result were observed by Vandakudri AB et al[8].

Modified Alvarado described a scoring system in 1986 which was later modified by kalan et al[10] to modified Alvarado score. The scoring system involves following components with a total score of 9. A score of 7 or more is considered high probability for appendicitis.

Conclusion

The study shows that use of MASS in patients suspected to have acute appendicitis provides a high degree of diagnostic accuracy.

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