IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 8 Ver. II (Aug. 2017), PP 01-04
www.iosrjournals.org

Evaluation Of Modified Alvarado Scoring System In Diagnosis Of Acute Appendicitis.

*Dr Sade Raj Kumar
Assistant Professor, Department of General Surgery, Kamineni Institute of Medical Sciences, Narketpalli, Telangana, India.
*Corresponding author: *Dr Sade Raj Kumar*

Abstract: *Difficulties in diagnosing acute appendicitis in a very young, elderly and female patients of reproductive age is due to their atypical presentation.Often these imaging studies involve learning curve and also infrastructure. there is always a need for a clinical acumen in diagnosing such a acute condition to avoid morbidity. Many scoring systems for the diagnosis of acute appendicitis have been tried, but most of these are complex and not feasible in emergency setting. The modified Alvarado scoring system has been shown by recent studies to be easy, simple and cheap diagnostic tool for supporting the diagnosis of acute appendicitis.The aim of this study is to assess the diagnostic value of modified Alvarado scoring system in patients with acute appendicitis at our centre. All the patients who were posted for appendicectomy were evaluated with modified Alvarado scoring system after initial clinico - radiological diagnosis. All the patients were operated based on our hospital protocol and not on modified Alvarado scoring system. Post operatively histopathological analysis of specimen was correlated with the modified Alavarado scoring and analysis was done. The present study has shown that MASS provides high degree of sensitivity, specificity, PPV, NPV and accuracy in the diagnosis of acute appendicitis and has found to be more helpful in male patients by showing lower negative appendicectomy rate and high positive predictive value for male patients as compared to females.*

Date of Submission: 28-07-2017 Date of acceptance: 05-08-2017

I. Introduction

Acute appendicitis, though one of the commonest conditions in surgical practice, can at times pose a challenge to the best of surgeons. Failure to diagnose the condition early during the course of the disease can lead to complications such as perforation, which is associated with higher morbidity and mortality. Hence, surgeons are therefore inclined to operate when the diagnosis is probable rather than wait until it is certain.[1]

A clinical decision to operate early leads to the removal of normal appendix in 15%-30% of cases.[1] This proportion can be reduced by observing equivocal cases for a period of time, a practice that seems to be safe for most patients.[1] Few cases of acute appendicitis may resolve spontaneously.[2,3] None the less, if a period of observation culminates in the diagnosis of a ruptured appendix, the patient may have a poor outcome that is avoidable. Reductions in the number of "unnecessary" or non-therapeutic operations should not be achieved at the expense of an increase in number of perforations.[4]

Difficulties in diagnosing acute appendicitis in a very young, elderly and female patients of reproductive age is due to their atypical presentation [5]. In such cases, clinical examination should be complemented with laparoscopy or diagnostic imaging such as Ultrasound scan or CT scan to exclude diseases other than appendicitis. Often these imaging studies involve learning curve and also infrastructure. there is always a need for a clinical acumen in diagnosing such a acute condition to avoid morbidity. Many scoring systems for the diagnosis of acute appendicitis have been tried, but most of these are complex and not feasible in emergency setting [5]. The modified Alvarado scoring system has been shown by recent studies to be easy, simple and cheap diagnostic tool for supporting the diagnosis of acute appendicitis especially for junior surgeons [6,7].The aim of this study is to assess the diagnostic value of modified Alvarado scoring system in patients with acute appendicitis at our centre.

II. Methodology

All the patients who were posted for appendicectomy were evaluated with modified Alvarado scoring system after initial clinico - radiological diagnosis. All the patients were operated based on our hospital protocol and not on modified Alvarado scoring system. Post operatively histopathological analysis of specimen was correlated with the modified Alavarado scoring and analysis was done (FIG 1). A total score of 7 or more is likely to have acute appendicitis and a score of less than 7 is unlikely to have acute appendicitis. Patients were followed up to 3 months for any recurrence of symptoms and for outcome analysis.

Symptoms	Score
Migratory right iliac fossa pain	1
Nausea/Vomiting	1
Anorexia	1
Signs	
Tenderness in right iliac fossa	2
Rebound tenderness in right iliac fossa	1
Elevated temperature	1
Laboratory findings	
Leucocytosis	2
Total	**9**

MASS SCORE	INTERPRETATION
1-4	Unlikely diagnosis of appendicitis
5-6	possible diagnosis
7-8	acute appendicitis present
9-10	definitive of acute appendicitis requiring surgery

Fig 1: Modified Alvarado Scoring system and interpretation.

III. Results

A total of 178 patients were enrolled in the study. Their ages ranged from 11 to 64 years (mean 29.78). There were 57 (32%) males and 121 (68%) females. The duration of illness of the study population ranged from 1 day to 22 days with a mean of 4.68 days. There was a significant association between the duration of illness and perforation rate [p-value = 0.003]. The modified Alavarado scoring system of the study population ranged from 3 to 9. (Mean 6.78). All patients in this study underwent appendectomy. Of these, inflamed appendix was the most common operative findings affecting 112 patients (62.9%). 17 patients (9.4%) had perforated appendices, 8 patients (4.7%) had gangrenous appendices and 5 patients (3.1%) had appendicular abscess [Table 1]. None of these appendicular complications was missed by the current scoring criteria (MASS).In this study, 117 patients (66.1%) had a MASS of seven and above and the remaining 61 patients (33.9%) had MASS below seven.

Table 1: Operative findings in the study group.

OPERATIVE FINDING	No of patients	Percentage
Inflammation	112	62.9%

HISTOLOGICAL FINDING	No of patients	Percentage
Acute Appendicitis	99	55.6%
Normal Appendix	16	8.7%
Suppurative appendicitis	21	11.8%
chronic nonspecific appendicitis	36	20.5%
Other Findings (Chronic pathology)	6	3.1%
TOTAL	178	100%

Perfortation	17	9.4%
Gangrene	8	4.7%
Appendicular Abscess	5	3.1%
Normal Appendix	16	8.7%
Other Findings	20	11%
TOTAL	178	100%

Table 2: Histopathological correlation of the study population.

Histological examination confirmed appendicitis in 85 patients (66.9%). The remaining 42 patients were found to have normal appendix giving a negative appendicectomy rate of 33.1% being 26.8% and 38.3% for males and females respectively. (Table 2]

The sensitivity and specificity of MASS in this study was 94.1% (males 95.8% and females (88.3%) and 90.4% (males 92.9% and females 89.7%) respectively. The PPV was 95.2% (males 95.5% and females 90.6%) and NPV was 88.4% (males 89.3% and females 80.1%. The accuracy of MASS was 92.9% (males 91.5% and females 87.6%).

IV. Discussion

Alvarado scoring system is a simple noninvasive diagnostic procedure. It is reliable, safe, repeatable and economical, and can be used, in an emergency setting. It can be easily applied by emergency medicine resident or general surgery resident, and there is no statistical difference in diagnosis of acute appendicitis in terms of application of the scoring system.[8-11] The Alvarado score is an easy and comprehensive system of scoring, since it takes into consideration symptoms, signs and laboratory reports. The gamut of symptoms and signs included in the scoring system are ones that constitute the traditional Murphy's triad. It also includes laboratory investigations. Neutophilic leucocytosis is the major criteria accompanied by evaluation of shift of the cellular count to the left.

Despite all attempts to make an accurate preoperative diagnosis a negative appendicectomy rate continues to prevail. The negative appendicectomy rates in most studies are in the range of 22-33%. [12,13] In the present study the negative appendicectomy rate was 8.7%, mainly in the female group. The sample size was inadequate for optimum statistical evaluation, yet an inference can still be drawn from the study with respect to the female population.

The present study has shown that MASS provides high degree of sensitivity, specificity, PPV, NPV and accuracy in the diagnosis of acute appendicitis, which is in agreement with findings reported by others [14,15],

Combining Alvarado scoring with radiological methods like USG or preferably CT scanning can lead to accurate preoperative diagnosis of the condition. However, the cost factor with imaging needs to be given a serious thought, especially in the developing world where financial constraints significantly guide the investigative approach to a patient. Hence, in such a scenario Alvarado scoring is of great diagnostic significance.

V. Conclusion

The present study has shown that MASS provides high degree of sensitivity, specificity, PPV, NPV and accuracy in the diagnosis of acute appendicitis and has found to be more helpful in male patients by showing lower negative appendicectomy rate and high positive predictive value for male patients as compared to females. Alvarado score require revision and modification to include only high sensitive and specific clinical symptoms and signs and also it includes left shift of Neutrophil maturation, which is not routinely done in many laboratories.

References

[1]. Hoffmann J, Rasmussen OO. Aids in the diagnosis of acute appendicitis. Br J Surg. 1989; 76:774-779.
[2]. Ooms HW, Koumans RK, Ho-Kang-You PJ, Puylaert JB. Ultrasonography in the diagnosis of acute appendicitis. Br J Surg. 1991; 78: 315-318.
[3]. Heller MB, Skolnick ML. Ultrasound documentation of spontaneously resolving appendicitis. Am J Emerg Med. 1993; 11: 51- 53
[4]. Velanovich V, Savata R. Balancing the normal appendectomy rate with the perforated appendicitis rate: implications for quality assurance. Am Surg. 1992; 58: 264-269.
[5]. Gilmore OJA, Jones D, Ynag Q. Appendicitis and mimicking conditions. Lancet. 1975;11:421–4.
[6]. Fenyo G, Lindberg G, Blind P, Enochsson L, Oberg A. Diagnostic decision support in suspected acute appendicitis: validation of a simplified scoring system. Eur J Surg Med. 1997;11:831–8.

[7]. Alvarado A. A practical score for the early diagnosis of acute appendicitis. Ann Emerg. 1986;11:557–65.
[8]. Talwar S, Talwar R, Prasad P. Continuing diagnostic challenge of acute appendicitis: evaluation through modifed Alvarado score: comment. Aust NZ J Surg. 1999; 69:821-822.
[9]. Eskelinen M, Ikonen J, Lipponen P. Sex-specifc diagnostic scores for acute appendicitis. Scand J Gastroenterol. 1994; 29:59-66.
[10]. Khan I, Rehman A. Application of Alvarado scoring system in diagnosis of acute appendicitis. J Ayub Med Coll Abottabad. 2005;17:41-44.
[11]. Jan H, Khan J. Evaluation of modifed Alvarado score in the diagnosis of acute appendicitis. Pak J Surg. 2007;23:248-250
[12]. Kalan M, Rich AJ, Talbot D, Cunliff WJ: Evaluation of the modified Alvarado score in the diagnosis of acute appendicitis: a prospective study. Ann R Coll Surg Eng; 1994; 76: 418-419.
[13]. Own TD, Williams H, Stiff G, Jenkinson LR, Rees BI: Evaluation of the Alvarado score in acute appendicitis. J R Soc Med; 1992; 85: 87-89
[14]. Kalan M, Talbot D, Cunliffe WJ, Rich AJ. Evaluation of the modified Alvarado score in the diagnosis of acute appendicitis: a prospective study. Ann R Coll Surg. 1994;11:418–9.
[15]. Jeerapata. The Modified Alvarado score versus Alvarado score for the diagnosis of acute appendicitis. The THAI journal of Surgery. 2005;11:69–72.

*Dr Sade Raj Kumar. " Evaluation Of Modified Alvarado Scoring System In Diagnosis Of Acute Appendicitis." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 16.8 (2017): 01-04