ORIGINAL ARTICLE

Alvarado Scoring System for Diagnosis of Appendicitis - How Much Reliable?

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ABSTRACT

Objective: To study the reliability of Alvarado scoring system for the diagnosis of acute appendicitis and to find out what are the most suggestive symptoms and signs of acute appendicitis.

Study design and methods: Descriptive cross sectional study done in Surgical Unit II, Sir Ganga Ram Hospital, Lahore. A total of 100 patients were admitted through emergency department with the complaint of pain right iliac fossa, irrespective of age and sex. Each patient was awarded a score on the basis of Alvarado scoring system. Appendicectomy was carried out in patients having a score 7 or greater than seven and appendix was subjected for histopathological analysis for the confirmation of diagnosis with a reasonable accuracy.

Results: showed that patients having score more than 7 have acutely inflammed appendix.

Key words: Alvarado scoring system, appendicitis.

INTRODUCTION

Pain right iliac fossa is a common presenting complaint in a surgical emergency department and acute appendicitis is the most commonly made diagnosis for this complaint. It is stated in the literature that the diagnosis of both the appendicitis and no appendicitis could be expected to be wrong in half of the time. So unnecessary appendisectomies are carried out which impose a considerable functional as well as financial burden on the hospitals. On the other hand, missing a diagnosis results in morbidity and mortality of patients in the form of perforation and mass formation, localized abscess or generalized peritonitis[1]. Periumblical pain, then shift to right lower quadrant pain/tenderness, anorexia, nausea, vomiting and low grade fever and leucocytosis are all signs and symptoms of acute appendicitis[2].

The diagnosis of acute appendicitis is made largely on clinical grounds and there are some investigations, which are of some value[2]. These include:

1. White cell count
2. Urinalysis
3. Ultrasound
4. Plain abdominal X-ray
5. CT scan
6. Laparoscopy- has greatly reduced the rate of negative appendicectomy but it involves lot of economic strain. It is especially useful in women, in whom negative appendicectomy rate is as high as 40% reported in some studies.

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Ultrasound examination is particularly useful in female patients when a differential diagnosis of twisted ovarian cyst, ectopic pregnancy or some other gynecological pathology is being entertained. Appendicular mass is evident in 2-6% of pts in whom an acute appendix is walled off to form an inflammatory mass. It varies pathologically between a "phlegmon" and a true abscess. Such a mass can be differentiated on Ultrasound or CT. There are some reports about high level of sensitivity and specificity of ultrasound regarding diagnosis of acute appendicitis, but for this high level of expertise is required. Such expertise is not routinely available for emergency situations, similarly CT scan has no place in routine diagnosis of acute appendicitis. So due to these reasons we need to have a clinically based criteria to diagnose or exclude acute appendicitis, so that unnecessary negative appendicectomy rate could be kept to a minimum.

Hence we need to search for more reliable symptoms and signs to diagnose acute appendicitis clinically with high accuracy. Alvarado scoring system is often used for this purpose (Fig.1).

Fig. 1: Alvarado Scoring System

Scoring feature	Points
Shifting of pain	1
Anorexia	1
Nausea and vomiting	1
Tenderness	2
Rebound tenderness	1
Temperature (>37.3 C)	1
WBC > 10,000	1
Shift to left of neutrophils	1

< 4 = Exclusion 5-6 = Monitoring >7 = Surgery

MATERIAL AND METHODS

The study was carried out on both male and female patients admitted through emergency department in surgical unit II, Sir Ganga Ram Hospital, Lahore from April 2004 to March 2006. Patients of all age groups were included in the study.

All patients had the complaint of pain right iliac fossa. Alvarado's scoring system was implemented to categorize (segregate) the patients into three groups. The group with the score of <4 acute appendicitis excluded, with the score of 5 – 6 were kept under observation and the patients group with score > 7 were diagnosed to be having acute appendicitis and were operated. Per operative findings were subjected to histological studies and the clinical diagnosis was reviewed retrospectively with histological results.

RESULTS AND OBSERVATIONS

Table 1: Age distribution

Age (years)	No. of patients	%age
Up to 20	30	30
20-30	40	40
30-40	30	30

Table 2: Sex distribution

Sex	No. of patients	%age
Male	43	43
Female	57	57

Distribution of Patients in Alvarado Scoring System

Table 3: History

Symptoms	No. of patients	%age
Shifting of pain	36	48
Anorexia	22	29
Nausea and vomiting	17	23

Table 4: Examination

Signs	No. of patients	%age
Tenderness	92	92
Rebound Tenderness	40	40
Temperature > 37.3 C	18	18
WBC >10,000	40	40

Table 5: Alvarado scoring system for patients

Score	No. of patients	%age
<4	09	09
5-6	13	13
>7	78	78

Table 6: Histology report / Clinical Diagnosis accuracy

Histology	No. of patients	%age
Acute suppurative	62	62
Fecolith	29	29
Negative	09	09
TOTAL	100	-

Table 7: Diagnostic Accuracy of Alvarado Scoring System

Score	No. of patients	Histopathology	Sensitivity
> 7	78	72%	92%
5 – 6	13	08%	65%

Hence Diagnostic accuracy came to be 92% with score > 7.

DISCUSSION

Appendecectomy for acute appendicitis is the most commonly done operation worldwide. Mostly it affects young adults but no age is immune. It has got very variable clinical presentation in both sexes and in different age groups. No investigation is diagnostic but on adjunct to clinical diagnosis as in other surgical conditions and the clinician has to rely on the symptomatology, positive clinical findings with minimal investigative support[2]. The diagnosis of appendicitis remains a difficult task despite all medical advances and investigations available; even for an experienced surgeon[3]. The rate of negative appendicectomies up to 30% is accepted by most surgeons[4]. Unnecessary surgery carries a complication rate of 20%, while unnecessary delay carries high morbidity[5]. It is an emergency and the surgeon has to decide early whether to operate or not. Negative appendicectomies are no more justified in modern clinical practice[5].

Alavarado scoring system can be used as good adjunct to surgical decision making in repeated cases of acute appendicitis[7]. The obstructive form of the disease which is carried by the presence of fecolith in more than 70% of patients can lead to gangrene and perforation[9].

Traditionally decision of an experienced surgeon has been of utmost importance in the diagnosis of acute appendicitis[3]. For the last few years the Alvarado scoring system has been employed in the diagnosis of the disease[5]. Exact diagnosis of disease is utmost important, since it involves surgical intervention after diagnosis and negative procedure not only imparts morbidity but also is an unnecessary load on health budget. Assessment of the patients can be improved by using the Alvarado scoring system as it relies purely on clinical history, signs and symptoms, physical examination, lab investigations and is easy enough to apply[8].

Clinical diagnosis by expert surgeon shall have better average.

RESULTS

In all the patients having the Alvarado score of greater than seven, the appendix was found to be acutely inflamed during surgery and it was confirmed on histology. In patients having a score of 4 or less, symptoms subsided with conservative treatment and no surgical intervention was required. 13% of the

patients with the score of 5-6 were explored after a period of monitoring and the appendix was found inflamed. 7% of the patients did not need any surgical intervention.

CONCLUSION

It is concluded that Alvarado scoring system is highly efficacious (sensitive) to diagnose or exclude appendicitis and to select those patients who need a period of monitoring to decide about the further management.

It is suggested that Alvarado scoring system should be implemented routinely to diagnose appendicitis with a reasonable accuracy.

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