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Sensitivity of Alvarado Score among the Suspected Appendicitis Patients at a Tertiary Level Teaching Hospital

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Abstract

Introduction: *The aim of this study was to screening the Sensitivity of Alvarado score among the hospitalized suspected appendicitis patients at Dhaka National Medical College Hospital for determine the diagnostic accuracy.* ***Materials and Methods:*** *It was an observational type of descriptive study, conducted in the Dhaka National Medical College Hospital, Dhaka, during the study period of July 2015 to December 2015. The study was approved by the institutional ethical committee.* ***Results:*** *Most of the appendicitis patients belonged to the between 21-30 years which was 64 (32%). Male appendicitis patients (52%) are more than the female patients (48%). Majority of the patients (69%) complains pain occurs in the Right iliac fossa. The sensitivity of Alvarado scores was 81.60%, specificity 74.58%, accuracy 79.35%, positive and negative predictive values were 87.18% and 65.67% respectively.* ***Conclusion:*** *Alvarado score has more specificity.*

Keywords: *Alvarado score, Appendicitis patients.*

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Introduction:

Acute appendicitis is the most common cause of 'Acute Abdomen' in young adults. Appendicectomy is the treatment of choice and it is the most frequently performed urgent abdominal surgery and is often the first major procedure performed by a surgeon in training[1]. Multiple scoring system have been developed for the diagnosis of acute appendicitis among which Alvarado is the most commonly used scoring system[2]. However this scoring system was created in west and when applied in different environments, such as middle east and asia the sensitivity and specificity levels achieved very low[3,4]. According to the Alvarado score, if score 1-4: acute appendicitis very unlikely, Score 5-7: acute appendicitis probable, Score 8-10: acute appendicitis definite. The aim of this study was to screening the sensitivity of Alvarado score among the patient presented with right iliac fossa pain and who are suspected of acute appendicitis in Dhaka National Medical College Hospital for determine the diagnostic accuracy. The Alvarado score system are given below.

Table A: Alvarado appendicitis score system.

Date of assessment	
Time of assessment	
Symptoms	**Score**
Pain migration to RIF	1.0
Anorexia	1.0
Nausea and vomiting	1.0
Signs	
RIF tenderness	2.0
Rebound tenderness	1.0
Fever	1.0
Investigations	
Raised WBC count	2.0
Shift of WBC to left	1.0
Total	10

Total score is achieved by adding all the score for each category

1 = Score 8-10: acute appendicitis definite.

2 = Score 5-7: acute appendicitis probable.

3 = Score 1-4: acute appendicitis very unlikely.

Materials and Methods:

It was an observational type of descriptive study, conducted in the Dhaka National Medical College Hospital, Dhaka, during the study

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period of July 2015 to December 2015. The study was approved by the institutional ethical committee. To evaluate the sensitivity of Alvarado score among the suspected appendicitis patients, a data collection sheet was prepared. Total 200 case records were studied during the study period. The data was obtained from the hospitalized patients. All filled questionnaires were entered into the computer for subsequent analysis using SPSS method version 20.1.

Results:

Table I shows mean age of the patients were 35.83(±12.30) years, minimum age was 18 years and maximum age was 57 years. Maximum age group was between 21-30 years which was 64 (32%).

Table-I: Age group distribution of the study population (n=200).

Age in years	Frequency	Percentage (%)
<20 years	16	8%
21-30 years	64	32%
31-40 years	48	24%
41-50 years	30	15%
>50 years	42	21%
Total	200	100%
Mean±SD	35.83 (±12.30)	Range 18-57 years

According to figure 1, More than half (52%) were male patients and 48% were female patients. Male and female ratio was 1.08:1.

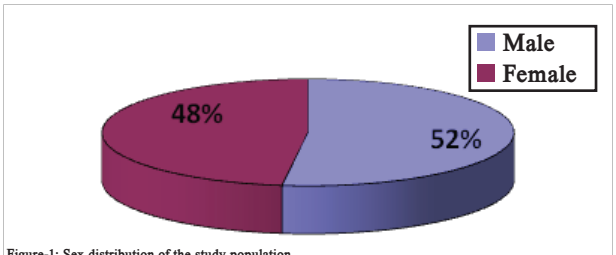

Figure-1: Sex distribution of the study population.

According to table II, in 29(14.5%) patients pain occurred at peri -umbilical region, 138(69%) patients pain occurred at Right iliac fossa and 33(16.5%) patients pain occurred at other place.

Table-II: Site of pain of the study population (n=200).

Site of pain	Frequency	Percentage (%)
Peri-umbilical region	29	14.5%
Right iliac fossa	138	69%
Other place	33	16.5%
Total	200	100%

According to table III, pathological findings 136(68%) were positive for acute appendicitis and 64(32%) were negative for acute appendicitis.

Table-III: Histo-pathological findings of the study population (n=200).

Histopathological findings	Frequency	Percentage (%)
Positive for acute appendicitis	136	68%
Negative for acute appendicitis	64	32%
Total	200	100%

According to table IV, Majority of the patients (63.5%) alvarado score ≥7.

Table-IV: Alvarado score of the study population (n=200).

Alvarado score	Frequency	Percentage (%)
<7	73	36.5%
≥7	127	63.5%
Total	200	100%

According to table V, sensitivity of Alvarado scores was 81.60%, specificity 74.58%, accuracy 79.35%, positive and negative predictive values were 87.18% and 65.67% respectively.

Table-V: Performance of the diagnostic test (n=200).

Parameter	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Accuracy
Alvarado scores	81.60%	74.58%	87.18%	65.67%	79.35%

Discussion:

Acute appendicitis is one of the common causes of emergency surgery. Most of the patient presented with the right lower abdominal pain. But the diagnosis of acute appendicitis and decision to make surgery is often difficult. Because the history and presentation of these patients are variable and accurate diagnosis is not easy, but the delay in the diagnosis may cause fatal complications which in turn increase morbidity and mortality. In this present study showed mean age was 35.83 (±12.30) years, minimum age was 18 years and maximum age was 57 years. Maximum age group was between 21-30 years which was 64 (32%). Majority 52% were male and 48% were female, male: female ratio was 1.08:1. In study of Chong et al.[5] showed the mean age of the patients (92 male, 100 female) was 25.1 ± 12.7 years. In Ismail Alnjadat I, Baha Abdallah study [6] male to female ratio was 1.5:1 and mean age was 26.52 years. These results are consistent with other studies[7, 8]. In our study most of the pain occurs in right illac fossa (69%). Our study results are similar to the Nshuti et al. [9] study but the percentage is not same. In their study they stated that most of the pain occurs in right iliac fossa (95%). In this study showed sensitivity of Alvarado scores was 81.60%, specificity 74.58%, accuracy 79.35%, positive and negative predictive values were 87.18% and 65.67% respectively. Khan et al.[10] applied the Alvarado scoring system in an Asian population and only achieved a sensitivity and specificity of 59% and 23%, respectively, with a negative appendicectomy rate of 15.6%. The sensitivity of the Alvarado score achieved when applied in an oriental population, at the suggested cut-off threshold of 7.0, was similarly low at 50.6%, but achieved a high specificity of 94.5%[11]. However, this improved when the cut-off threshold was lowered to 6.0, with a sensitivity and specificity of 88.3% and 94.5%, respectively, suggesting a definite ethnic difference with regard to the Alvarado score[11]. Both the Alvarado and modified Alvarado scores lack parameters that have been shown to be important determinants in the diagnosis of acute appendicitis, such as age, gender and the duration of symptoms. Wani et al.[12] have shown that the sensitivity and specificity of the Alvarado scoring system vary with age, gender and duration of the symptoms.

Conclusion:

Alvarado score has more specificity. The Alvarado scoring systems vary with age, gender and duration of the symptoms. So it is not 100 percent accurate for all the patients.

Conflict of Interest: None.

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