ORIGINAL ARTICLE

Study of Modified Alvarado Scoring System As A Diagnostic Tool For Acute Appendicitis

J.P. Dave¹*, P.K. Dharaviaparmar², G.N. Vaghasiya³, M.Vekariya⁴, S.O. Sankhala⁵.

¹Associate professor, ²Resident, ³Assistant professor, dept. of General surgery, P.D.U. Medical College, Civil Hospital, Rajkot.

INTRODUCTION

Acute appendicitis is one of the most common surgical emergencies. It occurs in all ages, with peak incidence in teens and early 20s. The incidence has been steadily dropping over past 25 years however, the incidence in the developing countries which in the past has been quite low has been rising in proportion due to economic gains and change in life style. The incidence of appendicitis is equal among males and females before puberty. In teenagers and young adults, Male-female ratio 1.3:1 there after the greater incidence in male declines.¹ In 1886 Reginald Heber described the classical signs and symptoms of acute appendicitis. Over the last two decades different protocols have been introduced and tested by different researchers which includes Lidverg, Fenyo, Cristian, Ohman and Alvarado scoring system, to make an early diagnosis of this sometimes very elusive disease. Alvarado scoring later modified and modified system evaluated.¹, ²-³ Initially appendix was credited with very little physiological function in body we now know, however, that appendix serves an important role in foetus and young adults. Endocrine cells appear in the appendix of human fetus at around the 11th week of development. These cells produce various amines and peptide hormones, helpful in homeostasis mechanism. Among the human, appendix is now thought to be involved in immune function. During the early years of development, appendix shows to function as a lymphoid organ, assisting with maturation of B-lymphocyte and production of antibodies.³ In the past, appendix was often removed during other abdominal surgery to prevent possibility of

ABSTRACT

AIMS AND OBJECTIVE: To determine sensitivity of modified Alvarado scoring (MAS) in preoperative diagnosis, To confirm efficacy of MAS by Histopathological examination, to reduce rate of negative appendicectomy.

MATERIALS AND METHODOLOGY: Patients presenting with suspected acute appendicitis were scored using the modified Alvarado scoring system. Patients of acute appendicitis were operated and Sensitivity of Modified Alvarado system assessed and confirmation done with Histopathological report. Thus MAS system was developed as diagnostic tool for acute appendicitis. RESULTS: A total of 100 patients were recruited in the study over a period of 24 months from September 2013 to September 2015. We have taken 6, 7 and 8 score as a cut of point. Sensitivity of these points were 89%, 72% and 41% respectively which suggest that as score increases sensitivity decreases. Specificity of these score were 60%, 83% and 100% respectively which suggests that as score increases specificity increases. Positive predictive value were 97%, 98% and 100% respectively which suggest that as score increases positive predictive value increases. Negative predictive value of these score were 23%, 16% and 8% respectively which suggest that as score increases negative predictive value decreases. CONCLUSION: The diagnosis of acute appendicitis is first and foremost a clinical diagnosis with scoring systems and Imaging being necessary in equivocal cases. By taking cut off point 7 it will detect patient of acute appendicitis with high sensitivity. Modified Alvarado score is a useful and easily available tool in the diagnosis of acute appendicitis. Modified Alvarado Score is a fast, simple, reliable, Non-invasive and safe diagnostic modality without extra expense and complication.

Key Words: modified Alvarado scoring system, appendicitis.

*Corresponding Author:
Dr. J. P. Dave.
Omkareshwar, 2-Greenpark
OPP. vasundhra residency
Airport Road, Rajkot.
PIN-360007
Mob no: 9879105086
later attack of appendicitis. Appendix is now spared in case it is needed later for reconstructive surgery if the urinary bladder is removed. In such surgery, section of intestine is formed into a replacement bladder, and the appendix is used to re-create a sphincter muscle so that the patient remains continent. In addition, appendix is used replacement of diseased ureter. Acute Inflammation of appendix is called as acute appendicitis. Various diagnostic methods used to diagnose acute appendicitis.

MATERIALS AND METHODS
A total of 100 patients were recruited in the study over a period of 24 months from September 2013 to September 2015. Study is conducted in P.D.U. Medical College and civil hospital, Rajkot. We have admitted the patient having pain in RIF, fever, vomiting, anorexia, tenderness, rebound tenderness in ward. Then history taken and clinical examination done and grading according to Alvarado scoring system. Score of 7 or >7 considered as a significant. Patients of acute appendicitis were operated and sensitivity of modified Alvarado system assessed and confirmation done with Histopathological report. Thus MAS system was developed as diagnostic tool for acute appendicitis.

Inclusion Criteria: Patients of all ages and both Sexes having RIF Pain.
Excision Criteria: - pregnancy
- appendicular lump formation.
- patient with burning micturition
- patient with diarrhoea

RESULTS AND DISCUSSION
A total of 100 patients were recruited in the study over a period of 24 months from September 2013 to September 2015. Out of which 62 were male and 38 were female. The ratio of male to female patients was 1.3:1. It occurs in all ages, with peak incidence between 21 to 30 yr. (Similiar results were found in Patrick M et al1) Migratory pain and tenderness is present in 100% patient, c/o fever, vomiting and anorexia are present in approximate 70 to 80% patient. so, the presence of these factors favours appendicitis. Rebound tenderness and leucocytosis present in approximately 50% cases. We have taken 6, 7, and 8 score as a cut off points. Result mentioned in below table.

Table 1: Summary Of Results.

<table>
<thead>
<tr>
<th>Cut Of Point</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tbody>
<tr>
<td>Sensitivity</td>
<td>89%</td>
<td>72%</td>
<td>41%</td>
</tr>
<tr>
<td>Specificity</td>
<td>60%</td>
<td>83%</td>
<td>100%</td>
</tr>
<tr>
<td>Positive Predictive Value</td>
<td>97%</td>
<td>98%</td>
<td>100%</td>
</tr>
<tr>
<td>Negative Predictive Value</td>
<td>23%</td>
<td>16%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Sensitivity of these scores were 89%, 72% and 41% respectively. Sensitivity of score is ability to detect true positive it means that score and HPE both positive for appendicitis. When score 6 taken as a cut of sensitivity is more (89%) as compare to when score 8 taken as a cut of (41%) Which suggest that as score increases sensitivity decreases, and to include more cases of acute appendicitis we have to keep cut off low as possible. Specificity of these scores were 60%, 83% and 100% respectively. Specificity of score is ability to detect true negative it means that score and HPE both negative for appendicitis. When score 6 taken as a cut off specificity is low (60%) as compared to when score 8 taken as a cut off it is almost 100%. Which suggest that as score increases specificity increases and if we take score 8 as a cut off there are 0% chance of missing case of acute appendicitis. Positive predictive value of these score were 97%, 98% and 100% respectively. Positive predictive value means ability to detect true positive out of total positive. When we take score 6 as a cut off PPV is low (97%) as compared to when score 8 taken as a cut off which is almost 100%. Which suggest that as score increases positive predictive value increases it means that chance of positive for appendicitis increases and if we take score 8 as a cut off almost all cases are positive. Negative predictive value of these score were 23%, 16% and 8% respectively, negative predictive value means ability to detect true negative out of total negative. When we take score 6 as a cut off there are more chance of negative for appendicitis (23%) as compared to when cut of is 8 (8%) which suggest that as score increases negative predictive value decreases which means that chance of being negative for appendicitis is decreases. Sensitivity means to diagnose
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pre operatively patient having acute appendicitis which we have operated for acute appendicitis and HPE suggestive of acute appendicitis. Specificity means to diagnose pre operatively patient not having acute appendicitis and which were reported as recurrent appendicitis in HPE. So, By considering this when we take cut off as 6 then sensitivity is high but specificity is low, when we take score 7 as cut off sensitivity and specificity both high and when we take score 8 as cut off specificity high but sensitivity is low. So, by taking cut off point 7Sensitivity and specificity both are high. So, it means patient having acute appendicitis diagnosed pre operatively and patient not having acute appendicitis diagnosed correctly.

CONCLUSION

The diagnosis of acute appendicitis is first and foremost a clinical diagnosis with scoring systems and imaging being necessary adjuncts in the equivocal cases.1 By, taking cut off point of modified Alvarado scoring as 7 it will detect patient of acute appendicitis with high sensitivity. The use of a protocol based on modified Alvarado score is a useful and easily available tool in the diagnosis of acute appendicitis. Modified AlvaradoScore is a fast, simple, reliable, Non-invasive and safe diagnostic modality without extra expense and complications. It can be very useful for junior doctors provided it is applied purposefully and objectively in patients.

REFERENCES