International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 1, January 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.1.2025.128

ORIGINAL RESEARCH

A study on clinical profile of patients with acute appendicitis

[1]Dr Manjunath Meti B,[2]Dr Shishira Vaidya K, [3]Dr Aravinda Sathya Seelan AP, [4]Dr. Rashmi Mani

[1,4]Assistant Professor, Department of Surgery, SDM Medical College, Dharwad, Karnataka, India
[2]Senior Resident, Department of Surgery, SDM Medical College, Dharwad, Karnataka, India
[3]Assistant Professor, Department of Surgery, Sri Madhusudan sai institute of medical sciences and research, Chikkaballapura, Karnataka, India

Corresponding Author
Dr. Rashmi Mani
Assistant Professor, Department of Surgery, SDM Medical College, Dharwad, Karnataka, India

Received: 29Nov, 2024 Accepted: 30Dec, 2024

ABSTRACT
Despite the common nature of the disease and the countless studies conducted, the etiological factors contributing to the condition of appendicitis remain unknown and obscure. Universally, it had been rare prior to the adoption of the western way of living.It has been observed that over the years, appendicitis has risen from being an insignificant disease to the most common severe intra-abdominal inflammatory pathology in western civilized areas, and this has been a matter of much speculation. 180 patients who presented to the Surgery OPD and Emergency Department with RIF pain were included in the study. Relevant history, examination and laboratory investigations done. Patients were scored according to both Modified Alvarado Scoring System (MASS) and RIPASA Scoring, and both were documented in the proforma. Among the 180 study patients, a total 110 patients were diagnosed as appendicitis using USG. Among these 84.54% underwent appendicectomy, 0.9% laparoscopic appendicectomy and 14.5% had conservative treatment.

Key words: Appendicitis,appendicectomy,laparoscopic appendicectomy

INTRODUCTION

Appendicitis is one of the most common acute conditions manifested in the emergency room as pain in the abdomen. The life-time rate for appendicectomy is 12 percent for men and 25 percent for women, with about 7 percent of all people undergoing appendicectomy in their lifetime[1].

The most frequently impacted age group is the second to fourth decades of life, with an average age of 31.3 years and a median age of 22 years.

Both sexes are affected, with a small male to female predominance of approximately 1.2-1.3:1).

Appendicitis is most often found in the United States, Canada, the United Kingdom, Australia, New Zealand, and the white population of South Africa. It is relatively uncommon in Asia and Central Africa. Studies have shown that the probability of a disease being determined by environmental factors is further supported by the fact that when people in the latter regions move to the western world or change to a western diet, appendicitis is more prevalent in them. Appendicitis is undoubtedly less prevalent in races that typically have a bulk cellulose diet[2].

Despite the common nature of the disease and the countless studies conducted, the etiological factors contributing to the condition of appendicitis remain unknown and obscure. Universally, it had been rare prior to the adoption of the western way of living.It has been observed that over the years, appendicitis has risen from being an insignificant disease to the most common severe intra-abdominal inflammatory pathology in western civilized areas, and this has been a matter of much speculation. Appendicitis is also found to be relatively uncommon in rural areas and economically less developed countries and to increase the incidence of economic growth, migration to urban areas and western countries. Although the exact etiological cause is not known, it is clear that several contributing factors are responsible for the development of appendicitis[3, 4].

Appendicitis is usually associated with a diet that is non-rough and high in meat. Racial distribution is largely due to the economic and dietary status of the individual race. More civilized countries have been reported as having a higher prevalence of disease. Appendicitis has a very interesting geographic

DOI: 10.69605/ijlbpr_14.1.2025.128

distribution. It is popular in highly developed countries such as the United Kingdom, the United States, France and Germany. It is low in Denmark and Sweden, but lower in Spain, Greece, Italy and the rural areas of Romania. For example, in a study conducted by Lucas Championnierin Romania, the incidence of appendicitis in rural areas was 1 in 22,000, while in cities it was 1 in 22 patients[5, 6].

METHODOLOGY

After consultation with the statistician, the sample size was calculated with the following formula and set as 180.

$n = t^2 \times p(1-p)m^2$

INCLUSIONCRITERIA

All patients presenting with Right Iliac Fossa (RIF) pain.

EXCLUSION CRITERIA

Patients presenting with non-RIGHT ILIAC FOSSA pain and those who have beenadmitted by other specialties for other complains but who subsequently developed RIGHT ILIAC FOSSA pain.

180 patients who presented to the Surgery OPD and Emergency Department with RIF pain were included in the study. Relevant history, examination and laboratory investigations done. Patients were scored according to both Modified Alvarado Scoring System (MASS) and RIPASA Scoring, and both were documented in the proforma. In both groups after final scoring, patients were categorized into 4 groups.

Category	RIPASA	Mass
D (Definite)	>12	>8
HP (High Probability)	7.5-12	7-8
LP (Low Probability)	5-7	5-6
U (Unlikely)	<5	<5

After this, the management of the patient was carried out according to the RIPASA Scoring system.

- Patients who fell under HP/D category, were taken up for surgery immediately.
- Patients who fell under LP category were subjected to further investigation for diagnosis.
- Patients who fell under U category were worked up for other causes of pain abdomen, other than appendicitis, by means of imaging and other appropriate laboratory studies.

Conservatively managed patients were discharged and followed up in the OPD, while for the patients who were operated upon directly, diagnosis was confirmed by intraoperative findings and HPE report. With the final diagnosis confirmation got from either CT scan or Intra-operative finding, or Post-operative HPE report, an analysis was done comparing both RIPASA and MASS.

RESULTS

The patient's age in the present study ranges from 6 years to 65 years. The mean age was 29.27 ±13.39 years. Most of the patients belonged to the age group of first and second decade. 32.2% and 30% of patients belonged to the age group of 15-25 and 25-35 years respectively. Only 8% belonged to the age group of more than 55. The percentage of male patients (61.1%) was more than female (38.9%).

DOI: 10.69605/ijlbpr_14.1.2025.128

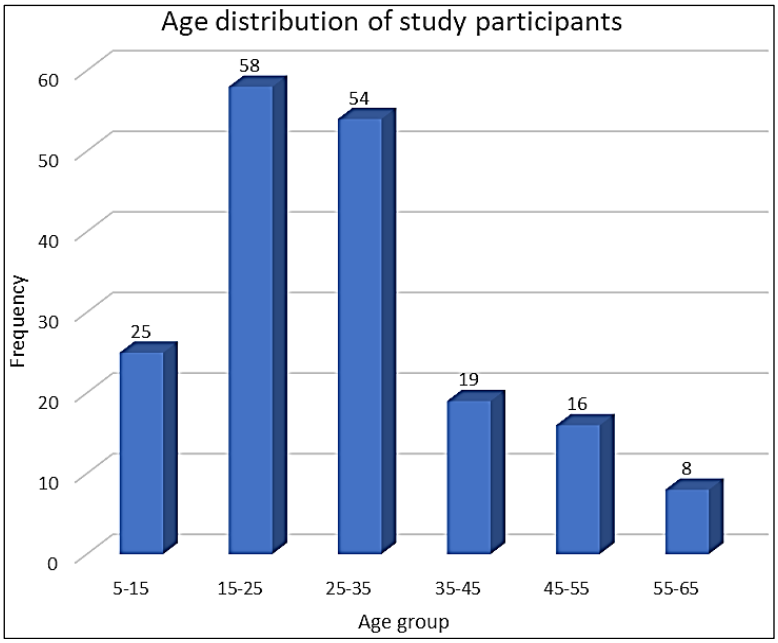

Figure 1: Age distribution of study participants (n=180)

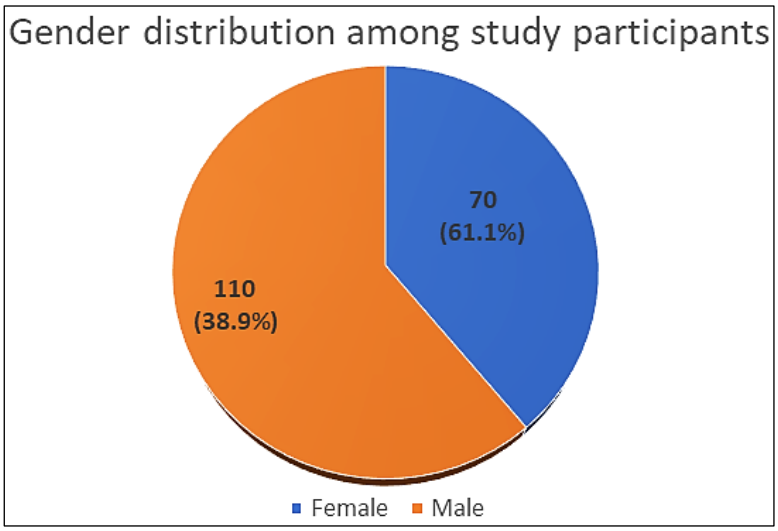

Figure 2: Sex distribution of study participants (n=180)

77.8% belonged to the age group below 40 years, and 22.2% above. Gender differentiation was 61.1% male and 38.9% female. 41.1% presented within 48 hours of onset of symptoms and 58.9% after. 100% of the patients had RIF pain, since it was the inclusion criteria of the study participants. 83.4% of them had RIF tenderness, 65.6% had a negative urinalysis, 27.8% had fever and 36.7% had a raised TC. 100% of the patients had nausea or vomiting.

DOI: 10.69605/ijlbpr_14.1.2025.128

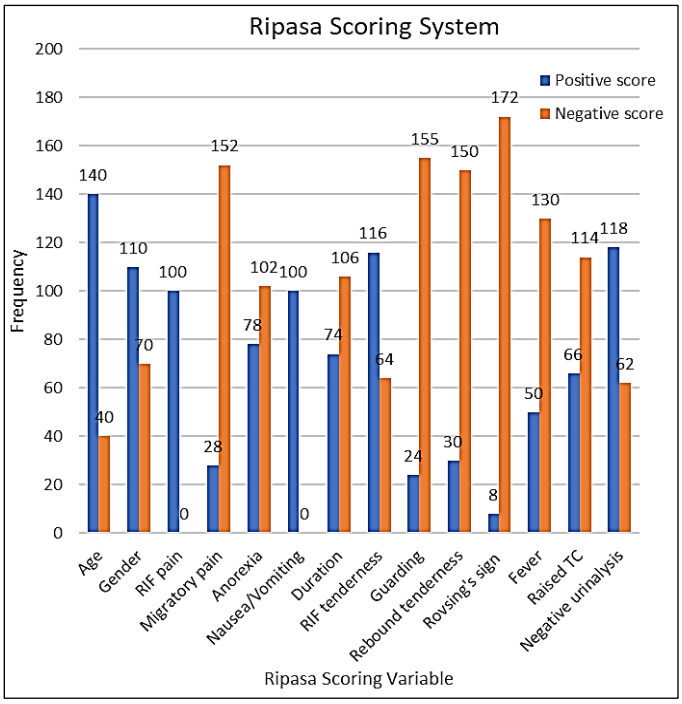

Figure 3: Parameters of RIPASA score in the sample of present study (n=180)

Finally, out of the total score, the patients were categorized under 4 categories. 4.4% of the patients had a score of >12 and were categorized as Definite, 23.9% with a score of 7.5-12 fell under the category High Probability, 34.4% had a score of 5-7.5 and were categorized as Low Probability and 37.2% with a score <5 were termed Unlikely.

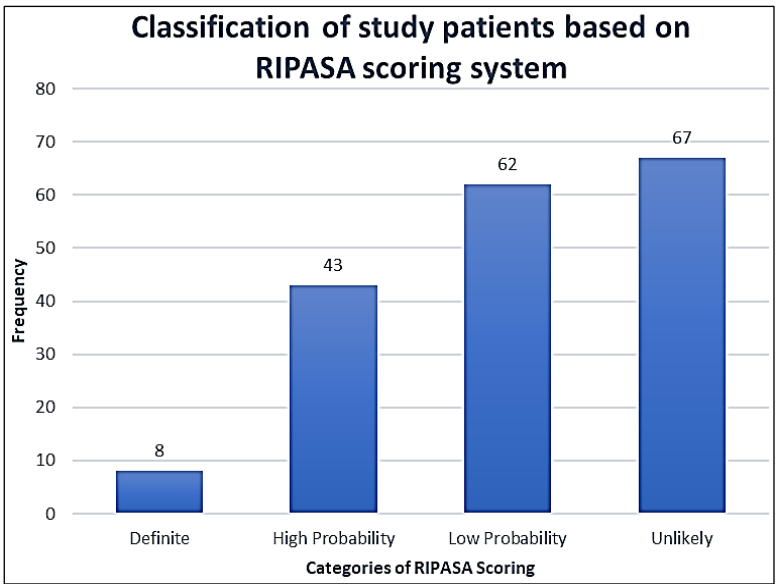

Figure 4: Classification of patients based on RIPASA Score (n=180)

In our study 64.4%, 30%, 33.3% and 46.7% had RIF tenderness, fever, raised TC and nausea/vomiting respectively. 15.6% patients had migratory pain, 42.8% had anorexia and about 17.2% had rebound tenderness.

DOI: 10.69605/ijlbpr_14.1.2025.128

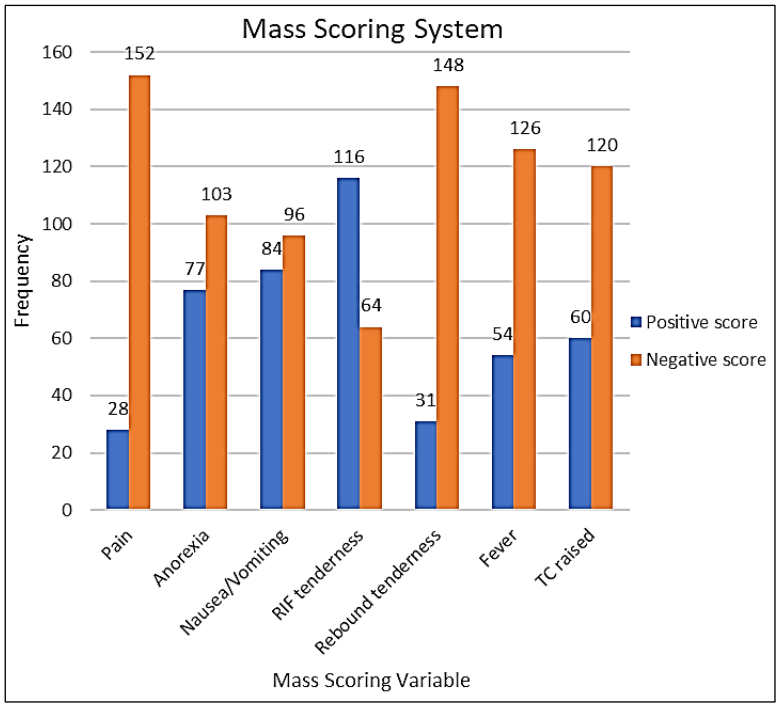

Figure 5: Parameters of MASS score in the sample of present study (n=180)

With the final score, patients were classified into 4 categories. 10% with score >8 fell under Definite, 9.4% with 6-7 were under High Probability, 22.2% with score 5-6 were under Low Probability, and 58.3% with score <5 were under Unlikely.

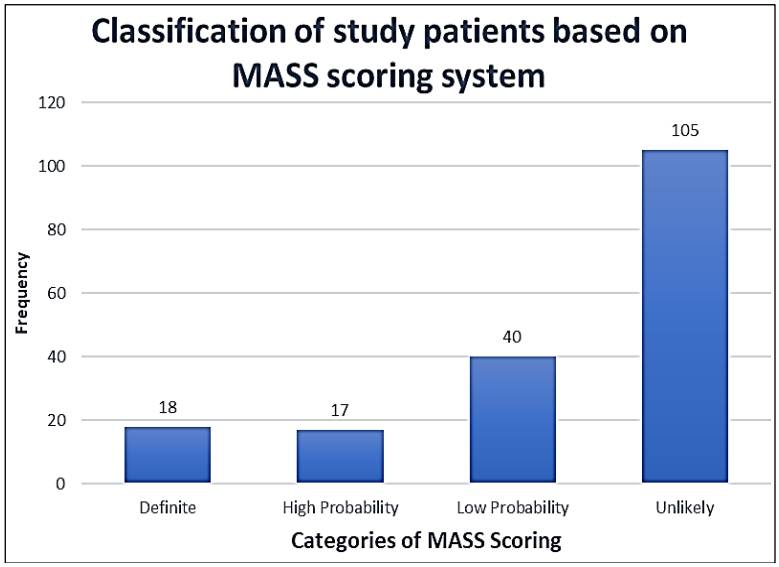

Figure 6: Classification of patients based on MASS Score (n=180)

Of the total 180 study patients 61.1% were found to have acute appendicitis. 20%, 8.3%, 4.4% and 2.8% were diagnoses as right ureteric calculus, PID, cystitis and right ovarian cyst or torsion respectively. Around 5% appendicular abscess and ileocecal tuberculosis.

DOI: 10.69605/ijlbpr_14.1.2025.128

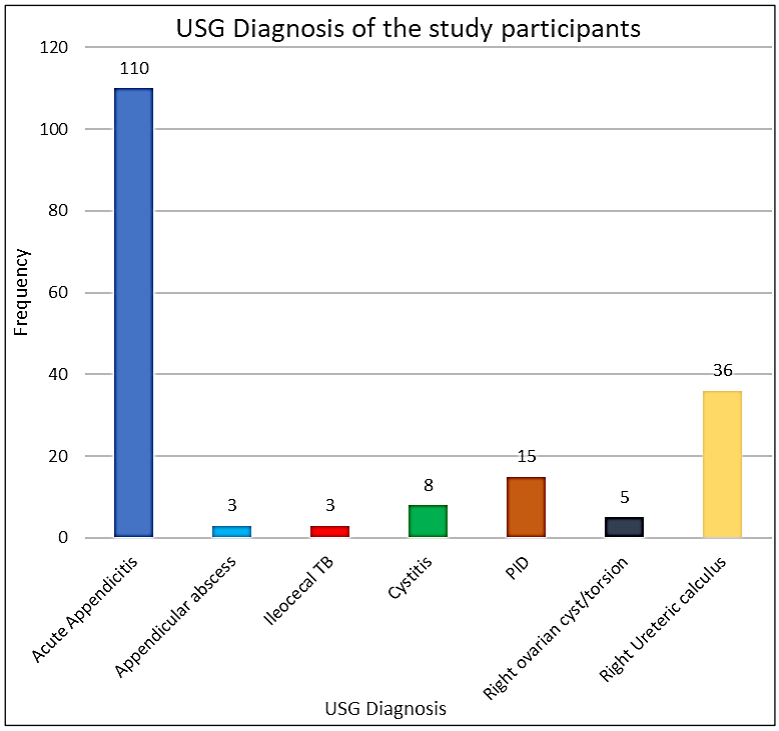

Figure 7: USG findings of study patients (n=180)

Among the 180 study patients, a total 110 patients were diagnosed as appendicitis using USG. Among these 84.54% underwent appendicectomy, 0.9%laparoscopic appendicectomy and 14.5%had conservative treatment.

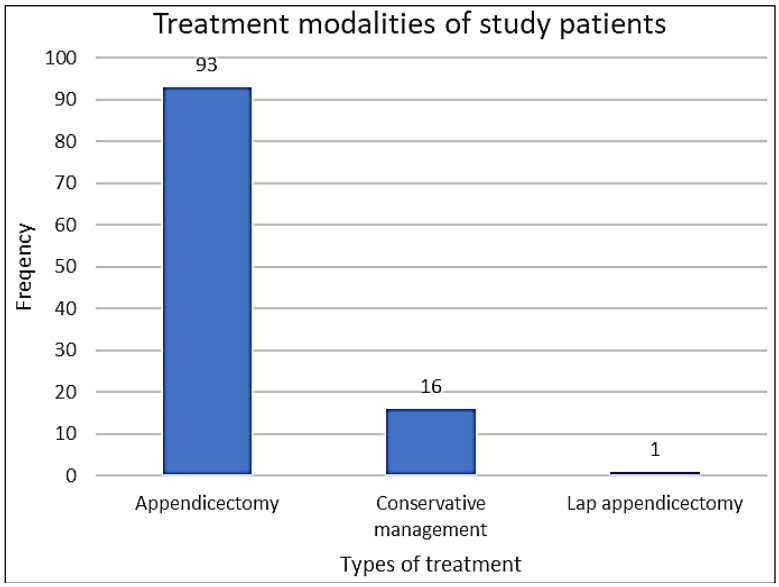

Figure 8: Types of treatment given to the study participants among those diagnosed as appendicitis (n=110)

DOI: 10.69605/ijlbpr_14.1.2025.128

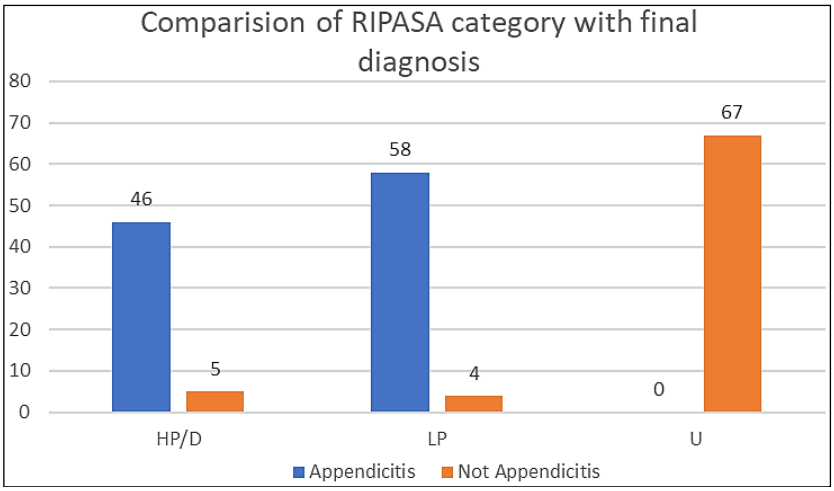

Figure 9: Comparison of final diagnosis with the RIPASA scoring (n=180)

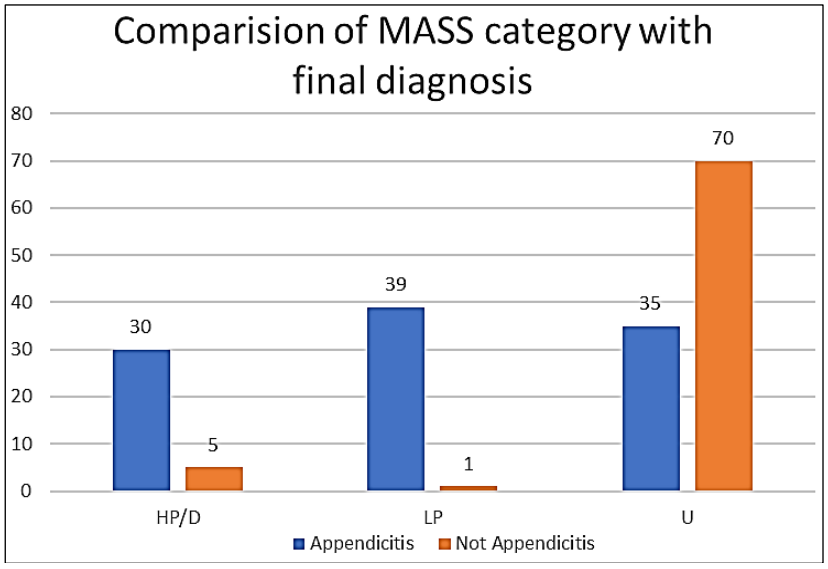

Figure 10: Comparison of final diagnosis with the MASS scoring (n=180)

Statistical analysis was done with the help of OpenEpi, Version 2 and SPSS software Version 16.

DISCUSSION

In 1986, Alvarado published what is now one of the most well-known and studied appendicitis scores[7]. A retrospective study was done on 305 patients admitted for suspected appendicitis. Clinical and laboratory findings were compared in relation to pathologically proven acute appendicitis. 277 patients were eligible for analysis. Eight criteria were chosen for inclusion in the diagnostic score. As Right Lower Quadrant (RLQ) Pain and Left Shift were found to be the most prevalent, they received 2 points each, while each of the remaining criteria were given 1 point. This initial study included an age range of 4 to 80 years (mean 25.3). An Alvarado Score of ≥7 was considered high risk for appendicitis. It was found to have a sensitivity of 81% and a specificity of 74%.

Since then, numerous studies have been done world across to check the Alvarado scoring in various populations.

Bond *et al*. prospectively studied 187 children aged 2-17 years with suspected appendicitis. They used Alvarado's cut-off score and found a sensitivity and specificity of 90% and 72% respectively, with a negative appendectomy rate of 17%. Lower cut-off scores (5 or 6) demonstrated improved sensitivity, but corresponding reductions in specificity, as expected[8].

Hsiao *et al*. conducted a retrospective study and confirmed Alvarado's data showing that RLQ tenderness and a left shift were the most prevalent signs in those with pathologically proven appendicitis. Patients with Alvarado Scores ≥7 were statistically more likely to have appendicitis than controls. Overall sensitivity and specificity for an Alvarado Score >=7 were 60% and 61% respectively[9].

Rezak *et al*., in their retrospective study, found a higher sensitivity and specificity-92% and 82% respectively. This study also suggested that a 27% reduction in CT scanning would have occurred, if patients with scores >7 had been managed directly by appendectomy without CT evaluation[10].

DOI: 10.69605/ijlbpr_14.1.2025.128

In a mixed pediatric-adult population, Owen *et al*. prospectively evaluated 215 patients and found the sensitivity and specificity were 93% and 81%[11].

Shreef *et al*. recently in 2010, performed a dual-centre prospective study, reviewing 350 patients. Interestingly, their reported statistical analysis was based on an Alvarado threshold of 6, and was based upon 2 different outcomes;

1) Performance of appendectomy.
2) Histology.

Using the standard threshold of 7 and including all comers related to histologic diagnosis, the sensitivity and specificity were 86% and 83% respectively[12].

Several attempts have been made to modify the Alvarado Score to improve its accuracy.

Macklin *et al*. sought to simplify the Alvarado Score by eliminating the criteria for left shift (Modified Score total 9), as done by Kalan in a mixed adult/paediatric study. Children aged 4-14 years were enrolled, demonstrating sensitivity and specificity of 76.3% and 78.8% respectively using a cut-off score of 7 or higher to predict histological appendicitis. Kalan's study was limited to 11 children, all of which had modified Alvarado Scores ≥7 and corresponding appendicitis. Obviously, these numbers are too small to draw any conclusions[13].

Sooriakumaran *et al*. further modified the score by decreasing the value of leukocytosis, to make a total score of 8. This score was then compared to clinical assessment by Emergency Physicians, and found wanting. However, one must be cautious, as only 3 children were included, and due to the change in total score, the threshold value was tested at 5.

Significant changes to the Alvarado Score were suggested by Impellizzeri *et al*. who studied 156 patients, replacing anorexia with an elevated fibrinogen level (>400mg/dL), changing migration of pain to length of pain (although not defined), combining RLQ pain and rebound into one criteria, and decreasing the temperature cut-off to 37 C. Of note, the diagnosis of appendicitis was made on surgical report, not pathologic diagnosis. The authors suggest the above modifications would have decreased admission rates by 15%[14].

CONCLUSION

Among the 180 study patients, a total 110 patients were diagnosed as appendicitis using USG. Among these 84.54% underwent appendicectomy, 0.9%laparoscopic appendicectomy and 14.5%had conservative treatment.

References:

1. Tzanakis NE, Efstathiou SP, Danulidis K, *et al*. A new approach to accurate diagnosis of acute appendicitis. World J Surg. 2005;29(9):1151-6, discussion1157.
2. Kharbanda, A. B., Taylor, G. A., Fishman, S. J., &Bachur, R. G. (2005). A clinical decision rule to identify children at low risk for appendicitis.Pediatrics, 116(3), 709–716. doi:10.1542/peds. 2005-0094
3. Lintula H, Pesonen E, Kokki H, Vanamo K, Eskelinen M. A diagnostic score for children with suspected appendicitis. Langenbecks Arch Surg.2005;390:164–70.
4. Sitter H, Hoffmann S, Hassan I, Zielke A. Diagnostic score in appendicitis. Validation of a diagnostic score (Eskelinen score) in patients in whom acute appendicitis is suspected. Langenbecks Arch Surg.2004;389(3):213-8.
5. Fenyö, G., Lindberg, G., Blind, P., Enochsson, L., & Oberg, A. Diagnostic decision support in suspected acute appendicitis: validation of a simplified scoring system The European journal of surgery = Actachirurgica, 1997;163(11):831-838.
6. Ohmann C, Yang Q, Franke C. Diagnostic scores for acute appendicitis. Eur. J Surg.1995;161:273-81.
7. Alvarado, A. A practical score for the early diagnosis of acute appendicitis Annals of Emergency Medicine,1986; 15(5),557–564.
8. Bond, G. R., Tully, S. B., Chan, L. S., & Bradley, R. L. Use of the MANTRELS score in childhood appendicitis: a prospective study of 187 children with abdominal pain Annals of Emergency Medicine, 1990; 19(9):1014–1018.
9. Hsiao, K.-H., Lin, L.-H., &Chen, D.-F. Application of the MANTRELS scoring system in the diagnosis of acute appendicitis in children Actapaediatrica Taiwanica, 2005; 46(3):128–131.
10. Rezak, A., Abbas, H. M. A., Ajemian, M. S., Dudrick, S. J., &Kwasnik, E. M. Decreased use of computed tomography with a modified clinical scoring system in diagnosis of pediatric acute appendicitis Archives of surgery (Chicago, Ill: 1960), 2011; 146(1): 64-67.doi:10.1001/archsurg.2010.297
11. Owen TD, Williams H, Stiff G, Jenkinson LR, Rees BI. Evaluation of the Alvarado score in acute appendicitis. J R SocMed.1992;85(2):87-8.
12. Shreef, K., Waly, A., Abd-Elrahman, S., &AbdElhafez, M. Alvarado score as an admission criterion in children with pain in right iliac fossa. African Journal of Paediatric Surgery, 2010, 7(3): 163. doi:10.4103/0189-6725.70417
13. Macklin, C. P., Radcliffe, G. S., Merei, J. M., & Stringer, M. D. A prospective evaluation of the modified Alvarado score for acute appendicitis in children Annals of the Royal College of Surgeons of England, 1997; 79(3):203–205.
14. Impellizzeri, P., Centonze, A., Antonuccio, P., Turiaco, N., Cifalà, S., Basile, M., Argento, S., *et al*. Utility of a scoring system in the diagnosis of acute appendicitis in pediatric age. A retrospective study Minerva chirurgica, 2002; 57(3):341-346.