Appendicitis, Alvarado, Histopathological, Ultrasonography, Clinical scoring systems.
Inclusion Criteria:
Patients who present with symptoms & signs of acute appendicitis who were:
1. Patients aged above 5 of either sex.
2. Patients willing for investigation and surgery.

Exclusion Criteria:
1. Known case of hypersensitive Other inoperable cases
2. Malnutrition and uncontrolled diabetes
3. Other clinically significant medical conditions that would impair wound healing including renal, hepatic, hematological, neurological and immunological diseases.
4. Patients receiving corticosteroids, immunosuppressive agents, radiation, or chemotherapy within one month prior to entry into study were also excluded.
5. Patients age - 14 years and below.
6. Pregnant females.
7. Appendicular mass.
8. Patient with recent history of any abdominal surgeries.

After initial assessment of patients presenting to the Out Patient department or emergency department of Sri Venkateshwaraa Medical College Hospital and Research Centre, Ariyur, with symptoms and signs suggestive of acute appendicitis between November 2016 to November 2017 (12 months), who met the inclusion criteria admitted and are initially subjected for detailed history taking, clinical examination and investigations like Hematological investigations, urine routine, X-ray abdomen/ chest, USG abdomen and CT scan as required. Following which they were evaluated using the Alvarado scoring.

A specially designed proforma was filled in for each patient. These proforma had general information about the patient plus eight variables based on Alvarado scoring system. Then the total score is calculated for each patient and based on the results patients are divided into three groups.

Group 1 - Those patients with scores of ≥ 7 -10 underwent Appendicectomy.

Group 2 - Those patients with scores of 5-7 who were thought on clinical grounds to require Appendicectomy, it was performed.

Group 3- Those patients with a score of <5 were observed and managed conservatively and reassessed.

Diagnosis of acute appendicitis is confirmed by operative findings and histopathological assessment of the Appendicectomy specimen. Finally the reliability of Alvarado scoring system is assessed by calculating sensitivity, specificity. Negative Appendicectomy rate (the proportion of operated patients having normal appendix removed) and Positive predictive value (the proportion of patients with a positive test result who actually have the disease).

Study criteria
Clinical symptoms such as vomiting, abdominal pain (periumbilical, diffuse, or right lower quadrant), abdominal distension, diarrhea, irritability, lethargy, grunting, anorexia, nausea and dysuria, was collected. Temperature upon admission, right lower quadrant tenderness at Mc Burney point, rebound tenderness; pain on percussion, rigidity, guarding, positive rectal sign, bowel sounds and gas was noted. Laboratory results and observations were discussed and compared with various other studies. In this study, the males accounted for 66% and the females 34%. The number of patients were highest in the age group 15 to 25 years (56%) followed by 26 to 35 years (40%). The least was in the age group of below 15 years (4%). Out of 50 patients, 33 (66%) were males and 17 (34%) were females. Most of the patients were younger age group. This result shows that there is predominance in the younger age group and the incidence peaks around 15 to 35 years and decreases as age progressed. Pain was the commonest presenting symptom and migratory RIF Pain has been observed in 88% all the cases in the present series. Other symptoms observed were nausea/vomiting in 96% of cases and anorexia in 86% of cases. Elevated temperature was present in 74% of the patients. Tenderness was present in 96% of cases and guarding was present in 92% of cases.

In our series when the score was more than 7 indicating strong possibility of intra-abdominal infection localized to the Right iliac fossa, emergency surgery was performed within 6 hours. These patients were found to have badly inflamed appendix with impending perforation once again indicating the sensitivity and specificity of the scoring system. In patients in whom score was ≥7 were observed for a period of 12-24 hours and re-assessed, where there was persistence of abdominal tenderness with increased WBC count appendicectomy was carried out. These patients were also found to have congested and inflamed appendix.

In this study the sensitivity, specificity and positive predictive value were 90%, 30% and 83.7% respectively. The positive predictive value shown by this study is comparable with the studies done by M Kalan, K A Malik and Ohmann who reported 87.5%, 85.3% and 87.4% respectively [78-80].

This study also revealed that Alvarado scoring system is more helpful in lowering negative appendicectomy rates. In the study by Ohmann et al the negative appendicectomy rate was 14.3% respectively [80]. In this study the negative appendicectomy rate is 42.9%.

Like other studies of Kalan et al, Denizbasi A, Al-Hashemy et al, Shrivastava UK et al sensitivity were 81.63%, 95.40%, 53.90% and 92.40% were compared to present study was 90%[78,81-83].

Increased proportion of negative appendicectomy is noticed for the Alvarado Score ≥7 and significantly decreased proportion negative appendicectomy is noticed for the Alvarado Score ≤7.

The only case who had a normal appendix at score ≥7 in the study by Ahmed et al. was a female [84]. Literature supports the observation that in females additional investigations are needed to support diagnosis, as Lamparelli et al. combined the Alvarado score with selective laparoscopy in adult females to increase the diagnostic accuracy and to avoid negative appendicectomy[85]. In his study it
In our present study, usefulness of both histopathological and USG scan as a diagnostic tool.

CONCLUSION
Acute appendicitis is the most familiar acute abdominal condition requiring surgery. In adults, it has a high prevalence than young age. Acute appendicitis diagnosis is till now in challenge. Findings by clinician from the sample and the surgeon's experience are of significance in diagnosing acute appendicitis. Although histopathological and USG is used frequently for diagnosis of acute appendicitis, along with Alvarado score is a helpful tool in clinical decision making. In peripheral hospitals, Alvarado score is simple, easily applicable because backup facilities are sparse in abdominal emergencies; it can be easily diagnosed. As there is an advantage of histopathological data with USG and Alvarado score for diagnosis of acute appendicitis when one has a high degree of clinical suspicion. The diagnosis in patients with equivocal features can be difficult, and in our sub-population, Alvarado scoring cut-off should be at >7 and <7, which readily increases the accuracy of Alvarado score in diagnosing acute appendicitis. However, the further information provided by histopathological and USG does improve diagnostic clarity in case of negative or positive Alvarado score. Thus, we bring to a conclusion that in beginning the diagnosis in patients suspected of having acute appendicitis, histopathological methods is better compared to USG and Alvarado scoring system. So, all the three methods were used for diagnosis of acute appendicitis diagnostic accuracy.