Original Research Paper

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General Surgery

STUDY OF PRE-OPERATIVE ASSESMENT & INVESTIGATIONS IN DIAGNOSIS OF ACUTE APPENDICITIS

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ABSTRACT

BACKGROUND AND OBJECTIVES : The aim of the study is to find out an preoperative protocol for reducing negative appendicectomy rates. This study also aimed at finding out sensitivity and specificity of Modified Alvarado scoring system, Ultrasound abdomen, C- reactive protein in detecting acute appendicitis.

METHODS : The study was conducted in a group of 100 cases admitted in Department of General Surgery with suspected appendicitis, who satisfied the inclusion and exclusion criteria. The study involved application of Modified Alvarado scoring system which was applied to all 100 cases. Out of 100 cases, ultrasound examination was done in 70 cases and 50 cases were done with C- reactive protein estimation. At the end of the study, sensitivity, specificity was calculated for Modified Alvarado scoring system, ultrasound examination and C- reactive protein estimation.

RESULTS: Modified Alvarado score showed sensitivity of 94% , specificity of 76% and positive predictive value of about 93.7%.This study showed ultrasound to have sensitivity of 76%, specificity of 75% and positive predictive value of about 93%.The sensitivity and specificity of C-reactive protein estimation was found to 78% and 66% respectively.

CONCLUSION: Applying Modified Alvarado scoring system preoperatively as a protocol in patients with suspected appendicitis is useful in reducing negative appendicectomy rates. Ultrasound examination was found to be useful in detecting appendicitis and differentiating other causes of pain abdomen mimicking appendicitis. C- reactive protein estimation is useful in doubtful cases of appendicitis.

KEYWORDS :

INTRODUCTION:

Approximately 6% of the population will suffer from acute appendicitis during their lifetime; therefore much effort has been directed towards early diagnosis and intervention. The diagnosis of appendicitis can be difficult, occasionally taxing the diagnostic skills of even the most experienced surgeon. Attempts to increase the diagnostic accuracy in acute appendicitis included computed tomography, ultrasonography and even radioactive isotope imaging. Various scoring systems have been devised to aid diagnosis. Negative appendicectomy rates at 25 –35% are not uncommon, and morbidity rates of negative appendicectomy, often parallel those of surgery for acute appendicitis. On the other hand a delay in diagnosis is associated with increased risk of perforation.

METHODOLOGY:

Patients admitted in the department of general surgery in NRI GENERAL HOSPITAL, CHINNAKAKANI from September 2018 to November 2019. All the studied cases were subjected to clinical assessment using signs, symptoms and laboratory criteria, which were recorded in the proforma. Of these 100 cases, 70 cases were submitted to ultrasound examination by a qualified radiologist and followed up. 50 cases from the study group were done with C-reactive protein estimation.

INCLUSION CRITERIA:

all cases admitted with signs and symptoms of acute appendicitis during the study period.

EXCLUSION CRITERIA:

Patients who were diagnosed to have other pelvic pathology related to uterus, adnexa and ureters after investigations.

Patients with complications of appendicitis such as appendicular mass and appendicular abscess.

Patients who were not operated upon either due to associated medical problems or refusal to get operated.

MODE OF SELECTION OF CASES, SAMPLING DESIGN AND METHOD OF ANALYSIS:

This prospective study was conducted in a group of 100 patients who got admitted in Department of General Surgery during the study period with symptoms. Detailed history taken regarding presenting complaints, duration, severity, onset of symptoms, mode of onset, progression of symptoms, change in pattern at the time of presentation. Enquiries were made about the personal habits regarding diet, bowel and bladder habits. In Females obstetric history was taken. Detailed examination regarding build, nourishment, hydration, general appearance and presence of systemic illness. Vital signs were recorded in each case. Thorough examination of the abdomen carried out in each case along with a per rectal examination. Modified Alvarado scoring system applied to each patient and the score calculated to each one of them. The findings are noted down. In selected cases ultrasonagraphic examination was performed by radiologists using hand held probe, in which whole abdomen was scanned to exclude possible differential diagnosis of acute appendicitis. In ultrasound examination findings such as presence of non compressible, tubular, non peristaltic, blind ending structure in the right iliac fossa with a diameter of more than 6mm was taken significant. In selected cases, C- reactive protein estimation was done by sending blood sample of the patient to microbiology laboratory. Estimation done using serial dilution technique using C- reactive protein kits.

After ruling out other differential diagnoses and concluding preoperatively as appendicitis, treatment was planned. Pre operative preparation consisting of bed rest, fluids parenterally, nil by mouth, preoperative dose of antibiotics taken care. On the basis of clinical impression after examination, decision to operate was taken by the surgeon.

Acute appendicitis cases were treated with emergency surgery. Anaesthesia was either general or spinal anaesthesia. In Open appendicectomies, abdomen was opened either by Mcburney's incision or Lanz incision or occasionally by right paramedian incision. In Laparascopic appendicectomies, ports were inserted after creating pneumoperitoneum. Appendicectomy was done. In some cases of open appendicectomies stump was ligated and invaginated by purse string sutures. In some others, stump was ligated alone. The per operative findings were noted with particular importance to features of inflammation of appendix. The final diagnosis of acute appendicitis was confirmed by histopathology report.

Post operatively, patients were managed as follows :

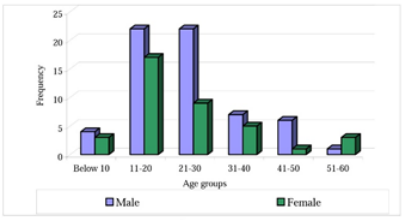
1. Parenteral antibiotics as and when necessary.
2. Intravenous fluids given as maintenance.
3. Parenteral nutrition until bowel activity returned.
4. Analgesics.
5. Monitoring of temperature, pulse, blood pressure and respiration carried out at regular intervals.

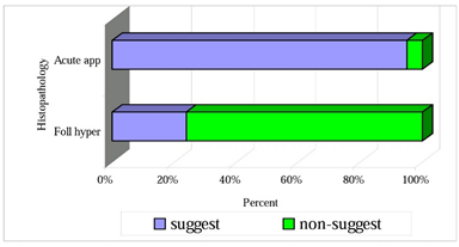
Stitches were removed on the 7th post operative day. On discharge patients were advised to come for regular follow up.

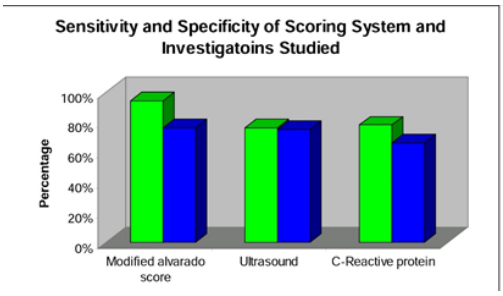
The features of clinical assessment assessed in each case such as right iliac fossa tenderness, rebound tenderness, guarding and rigidity noted down. Modified Alavarado score was calculated and the result compared with per operative and more importantly with histopathology of the appendix. The sensitivity, specificity and positive predictive value for the Modified Alvarado score was calculated. Ultrasound findings as well as C - Reactive protein estimation preoperatively, in the same above mentioned manner, correlated with histopathology of the appendix.

RESULTS:

Graph – 1: Number of cases according to age and sex.







DISCUSSION:

This study involved 100 patients with acute appendicitis that presented to NRI GENERAL HOSPITAL within a period of 14 months. The age group in which maximum patients presented was 11-30 years. Male patients outnumbered female patients.

Modified Alvarado scoring system which was applied to each patient preoperatively to detect appendicitis, was found to have a sensitivity of 94% and specificity of 76%. This finding agreed with respect to sensitivity when compared with Fenyo who reported in one study, sensitivity of 90.2%. specificity was found to be less when compared to the result of 91.4%.

In this study, ultrasound was found to have sensitivity of 76% and specificity of 75%, positive predictive value of 93%. This finding is comparatively low when compared with the findings observed by other studies. To mention some of them, Charles. D. Doughlas et al, in their study using graded compression ultrasonography performed in 139 patients, the sensitivity and specificity of ultrasonography for diagnosing appendicitis was found to be 95% and 89% respectively.

C-Reactive protein estimation in this study was found to be useful in finding acute appendicitis in patients suspected to have appendicitis.it is found to have sensitivity of 78% and specificity of 66%, positive predictive value of 80%. This finding of sensitivity in this study is comparatively low when compared to other studies. The reading of CRP were ranging between 0 and 11.7 mg/L (Mean 5.6 mg/L) in patients with normal appendix and between 6-93.4 mg/l in patients with acute appendicitis.The measurement of CRP does not require any specialized laboratory equipment

CONCLUSION

- In this study there was a preponderance of patientsaged less than 30 years, affected by appendicitis, constituting about 77%. The rest 23% constituted by patients aged more than 30 years.
- In this study, there as a preponderance of the male patients when compared to female patients. Male patients contributed to around 62% whereas female patients contributed to only 38%.
- The mean age of male patients presenting with acute appendicitis is around 24 years and female patients presenting with acute appendicitis is also the same. The maximum age of presentation in males was 51 years and females was around 60 years.
- In this study, out of 100 patients suspected of acute appendicitis, significantly around 82 patients had migrating type of pain , migrating from umbilicus to the right iliac fossa. Only 1% had a vague pain abdomen. Anorexia was found associated with 74% of the patients.
- The presence of nausea or vomiting was found in about 77% of patients. Most of the patients who had vomiting had around 1-2 episodes per day. More than 5 episodes per day was noted only in 5% of the patients.
- Out of the signs elicited in acute appendicitis, right iliac fossa tenderness was found in about 80% of the patients. Rebound tenderness was found in about 73% of patients. Elevated temperature is not a common feature in acute appendicitis seen only in about 13% of the patients.
- In the investigations for acute appendicitis, elevated leucocyte count more than 11,000 cells/ cu.mm was noted in about 60% of the patients. This implies only elevated leucocyte count is not specific for detecting appendicitis but should be compared with other clinical features.
- Right iliac fossa tenderness was found more common in younger age group patients. Comparatively, in older age groups, they did not show classical right iliac fossa tenderness but a vague tenderness was found out.
- Elevation of temperature was not found to be statistically significant in cases of acute appendicitis, but comparatively elevation of temperature was found more with younger patients with acute appendicitis aged around 11 to 30 years.
- Elevation of leucocyte count was found more in younger age group patients aged 11-30 years compared to only 23% of patients aged more than 30 years.
- Acute appendicitis was detected in 93.6% of patients who also had histological features of acute appendicitis. Ultrasound did not detect appendicitis in 39.1% cases of follicular hyperplasia. Thus the overall sensitivity of ultrasound was found to be 76% and specificity as 75%.
- C-Reactive protein estimation showed elevated levels in histologically proven cases of acute appendicitis in about 80.6% cases whereas, in contrary the raised was not proved in cases was not proved in cases of follicular hyperplasia in about 63.1% cases. Thus overall C-Reactive protein estimation was found to have sensitivity of 78% and specificity of 66%.

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