ACCURACY OF CLINICAL AND LABORATORY PARAMETERS IN THE DIAGNOSIS OF ACUTE APPENDICITIS

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Article Info: Received 10 January 2020; Accepted 14 February 2020

DOI: <https://doi.org/10.32553/ijmbs.v4i2.1024>

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Conflict of interest: No conflict of interest.

Abstract

Introduction: The diagnosis of acute appendicitis is generally clinical and once it is diagnosed, operative management ensues. Abdominal pain is the main presenting complaint of patients with acute appendicitis. The diagnostic sequence of colicky central abdominal pain which is followed by vomiting with migration of the pain to the right iliac fossa. The site of maximal tenderness is often said to be over McBurney's point. Specialist investigations are rarely needed to confirm a diagnosis of acute appendicitis, and the diagnosis is predominantly a clinical one. Judicious use of urine and blood tests, for inflammatory response variables, allow exclusion of other pathologies and provide additional evidence to support a clinical diagnosis of appendicitis.

Material and Methods: Every patient with acute onset of right lower quadrant abdominal pain and without previous history of appendectomy was considered as suspected of having acute appendicitis. Every patient with right iliac fossa pain and without history of appendectomy is suspected of having appendicitis until proven otherwise were included in the study. All Clinical and laboratory tests relevant to acute appendicitis were done among study participants. In Clinical parameters appetite, diarrhea, dysuria, vomiting, signs of localized peritonitis i.e. rebound tenderness and or guarding and pain migration was observed. In laboratory parameters, CRP, complete blood count (CBC) were measured and analysed. Patient's demographic characteristics were noted.

Results: A total of 100 patients were included in the study of which 50 were included in the control and 50 in case group. Mean age in control group was 29 ± 7.23 years while in acute appendicetomy group was 29 ± 8.77 years. In control group 44% were male and 56 % were female while in acute appendicitis 42% were male and 58 % were female. All clinical presentations were statistically significant in case and control group. CRP was positive in 8 (16%) in control group while in Acute appendicitis group it was 21 (42%) ($P=0.0071$).

Conclusion: CRP did not contribute to the overall diagnostic accuracy. The successful diagnosis of acute appendicitis can be done through proper clinical examination and adequate evaluation of laboratory parameters

Keywords: Acute Appendicitis, CRP, appendicetomy

Introduction

The diagnosis of acute appendicitis is generally clinical and once it is diagnosed, operative management ensuesⁱ, despite appendicitis being a common disease, its presentation is not always typical and misdiagnosis is therefore not uncommonⁱⁱ. Abdominal pain is the main presenting complaint of patients with acute appendicitis. The diagnostic sequence of colicky central abdominal pain which is followed by vomiting with migration of the pain to the right iliac fossa was first described by Murphy but this classical characteristic may only be present in 50% of patientsⁱⁱⁱ. The lifetime risk of acute appendicitis in the general population is about 7%^{iv}. The rates of false positive findings in the diagnosis of appendicitis vary from 8 to even 30%^{v,vi}. Improper diagnosis may lead to negative appendicectomies or cases of missed appendicitis resulting in complications such as appendiceal perforation or appendicular abscess

formation^{vii}. The typical clinical picture, with pain migration towards the right lower quadrant of the abdomen or signs of localized peritonitis, is generally found in much less patients than it is thought^{viii} also too much reliance on laboratory findings can misguide a surgeon's diagnosis^{ix}.

In classical cases patient is often flushed, with a dry tongue and an associated fetor oris. there is presence of pyrexia associated with tachycardia, abdominal examination shows localised tenderness and muscular rigidity after localisation of the pain to the right iliac fossa. The site of maximal tenderness is often said to be over McBurney's point, which lies two thirds of the way along a line drawn from the umbilicus to the anterior superior iliac spine on the left side^x.

There are many scoring systems and diagnostic pathways have been developed to improve diagnostic accuracy of acute appendicetomy. Specialist investigations are

rarely needed to confirm a diagnosis of acute appendicitis, and the diagnosis is predominantly a clinical one. Judicious use of urine and blood tests, for inflammatory response variables, allow exclusion of other pathologies and provide additional evidence to support a clinical diagnosis of appendicitis^{xi}. The use of ultrasonography and computed tomography scanning can also be used in accurate diagnosis of appendicitis^{xii}.

Most of the guidelines acknowledge the overlapping similarity of symptoms in acute appendicitis and urinary tract infection, particularly in women, the most recommended laboratory tests for acute appendicitis diagnosis is WBC and CRP^{xiii, xiv}.

Material and Methods:

Present case control study was conducted in the Dept. of General Surgery Assistant Professor Dept. of General Surgery K.D. Medical College Hospital and Research centre. The data were collected through patient's record and hospital information system. Every patient with acute onset of right lower quadrant abdominal pain and without previous history of appendectomy was considered as suspected of having acute appendicitis. Every patient with right iliac fossa pain and without history of appendectomy is suspected of having appendicitis until proven otherwise were included in the study.

Patients with palpable mass or tumour in right lower abdominal quadrant and patients with chronic pain, with chronic right iliac fossa pain was not considered and were excluded from the study.

All Clinical and laboratory tests relevant to acute appendicitis were done among study participants. In Clinical parameters appetite, diarrhea, dysuria, vomiting, signs of localized peritonitis i.e. rebound tenderness and or guarding and pain migration was observed. In laboratory parameters, CRP, complete blood count (CBC) were measured and analysed. Patient's demographic characteristics were noted.

Statistical analysis was done using SPSS 21.0 software. Normality of distribution was tested. All clinical variables are given in absolute number and percentages. Clinical and demographic variables were compared with the comparison of proportions test. Age is given in median and range and tested with Mann-Whitney test between groups. Measured variables that followed the normal distribution are expressed as mean value and standard deviation. A value of $P < 0.05$ was considered as the threshold of significance

Results:

A total of 100 patients were included in the study of which 50 were included in the control and 50 in case group. Mean age in control group was 29 ± 7.23 years while in acute appendicitis group was 29 ± 8.77 years

Table1: Comparison of basic demographic characteristics between patients with confirmed acute appendicitis and in the control group

	Control group	Acute appendicitis group	P value
Male	22 (44%)	21 (42%)	0.8407 (NS)
Female	28 (56%)	29 (58%)	0.8407 (NS)

NS; Not Significant.

In control group 44% were male and 56 % were female while in acute appendicitis 42% were male and 58 % were female.

Table 2: Clinical presentation on both the groups

Clinical presentation	Control group	Acute appendicitis group	P value
Loss of appetite	15 (30%)	21 (42%)	0.0075
Vomiting	11 (22%)	31 (62%)	0.0001
Diarrhoea	15 (30%)	5 (10%)	0.0157
Rebound tenderness/ guarding	5 (10%)	27 (54%)	< 0.0001
Pain migration	3 (6%)	22 (44%)	< 0.0001
Dysuria	10 (20%)	2 (4%)	0.0164

All clinical presentations were statistically significant in case and control group.

Table 3: Comparison of laboratory parameter CRP

	Control group	Acute appendicitis group	P value
CRP	8 (16%)	21 (42%)	0.0071

CRP was positive in 8 (16%) in control group while in Acute appendicitis group it was 21 (42%) ($P=0.0071$)

Discussion:

The diagnosis of acute appendicitis is predominantly a clinical one. The cause of acute appendicitis is unknown but is probably multifactorial like luminal obstruction and dietary and familial factors have all been suggested by the authors^{xv}. Appendicitis is commonly seen in the ages of 10 and 20 years, but no age is exempt with the overall lifetime risk is 8.6% for males and 6.7% for females in the United States^{xvi}. Abdominal pain is the primary presenting complaint of patients with acute appendicitis³.

The initial pain in acute appendicitis represents a referred pain resulting from the visceral innervation of

the midgut, and the localised pain is caused by involvement of the parietal peritoneum after progression of the inflammatory process. Loss of appetite is often a predominant feature, with constipation and nausea which are often present. Profuse vomiting may be the sign of development of generalised peritonitis after perforation but is rarely a major feature in simple appendicitis^{xvii}.

In our study we observed that symptoms of typical migratory pain and localized signs of peritonitis in the right lower quadrant is seen in 44% cases which was similar to the findings by Laméris W et al^{xviii}. Fan Z et al in their study suggested that there is no sign, symptom, or laboratory test, or their combination, that is 100% reliable in the diagnosis of acute appendicitis^{xix}.

Compared to control group in our study CRP was significantly detected in acute appendicitis patients but literature suggested that, the determination of CRP in the diagnosis of acute appendicitis, the logistic regression did not identify CRP concentration as a significant contributor to the acute appendicitis diagnosis^{xx, xxi}. Authors also demonstrates that CRP is not a good tool for helping the surgeon make the diagnosis of appendicitis^{xxii}.

Conclusion:

Our findings suggest that with the presence of migratory history of pain and/or signs of peritoneal inflammation may help the surgeon's decision not to delay an urgent appendectomy. CRP did not contribute to the overall diagnostic accuracy. The successful diagnosis of acute appendicitis can be done through proper clinical examination and adequate evaluation of laboratory parameters.

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