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Research Article

AN ANALYTICAL STUDY OF ANTIBIOTICS HELPING OR DELAYING DIAGNOSIS OF APPENDICITIS IN PAEDIATRIC PATIENTS

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A B S T R A C T

Introduction: The diagnosis of appendicitis in children is difficult and poses a challenge for clinicians. Recent trends in management of acute abdomen is by starting with empiricalantibiotics.The point of this investigation was to decide if beginning treatment with antibioticsagents hindered consequent diagnosis of appendicitis.

Materials and methods: A retrospective study of 200 cases treated for appendicitis between May 2017 to May 2018.Patients were classified into two gatherings. First group received antibiotics priorto a definitive diagnosis of appendicitis whereas second group did not receive antibiotics prior to a diagnosis of appendicitis.

Results: In the present study, we observed abdominal tenderness less marked in patients receiving antibiotics. As compared to group 2 patients, group patients have fundamentally higher C-reactive protein and pre-operative temperature. Theperforation rate and complication rate were significantly more noteworthy in group 1.Urinary tract infection and respiratoryinfection were the commonest misdiagnoses. Misdiagnosis results in significant elay before appendicectomy.

Conclusions: Pre-diagnosis antibiotics masks the actual signs of appendicitis and thus delays the management and causes significantly higher rate of complications.Thus, the diagnosis ofacute appendicitis must be considered and,all children seen with abdominalpain excluded who have recently been treated with antibiotics, if necessary.

INTRODUCTION

A common surgical emergency among children is Acute appendicitis (1-2% in paediatrics surgical admissions) [1].By and large, 1-8% of children presenting with abdominal pain suffered from acute appendicitis.However, Appendicitis is uncommon in pre-school Children (2 to 9% children presenting with acute appendicitis) [2].

Regardless of the accessibility of cutting edge diagnostic imaging, the analysis of intense appendicitis in youthful youngsters remains a challenge as the majority of such patients present late with difficultiese.g. perforation leading to abscess formation, generalized peritonitis and sepsis. The delay in the diagnosis of acute appendicitis has been attributed to nonspecific presentations, overlap of symptoms with many other common childhood illnesses, together within this age group inability of child to show and difficult abdominal examination. The numbers 28 to 57% are the misdiagnosis rate of every 2 to 12-year-old children and approaches to nearly 100% in children younger than 2 years.

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The death rate for appendicitis in youngsters has remained moderately unaltered since the 1940s, when antibiotics were introduced in the treatment of appendiceal peritonitis. Presumably owing to a failure of early recognition and treatment, this time the incidence of appendiceal rupture has increased appreciably. The expanded rateof rupture must result either from early misinterpretation of physical findings or fromgreater delay by parents in responding to the child's illness [3], since it is unlikelythat the natural history of the disease has changed, Surgeons should be cautious about delaying surgery beyond 36hours from symptom onset in patients with appendicitis [4]. Antibiotics may be prescribed empirically for children with abdominal pain because of suspected diagnoses such as urinary tract infection (UTI) and pneumonia. The prior treatment with antibiotics blunts the clinical signs of appendicitis in childrena general perception. The aim of this study was to determine whether prior treatment with antibiotics masks the clinical signs of and reduces the inflammatory response to appendicitis.

METHODS AND MATERIALS

It was a case-control study in which the case files of 200 children admitted to the Krishna Institute of Medical Sciences, Karad, with appendicitis between May 2017 and May 2018 were reviewed retrospectively. Age, sex, past medical history

(PMH) and symptoms data was collected. Information from the time of admission to hospital was recorded, including: clinical examination (mild right iliac fossa (RIF) tenderness, moderate RIF tenderness, severe RIF tenderness or nonspecific tenderness, based on annotations in the patient's file), method of definitive diagnosis, (clinical or nonclinical, i.e. radiological or at laparotomy/laparoscopy) and markers of inflammatory response [maximum preoperative temperature, C-reactive protein (CRP) and white cell count (TLC)]. Pathological diagnosis was classified according to operative and histological findings as either inflamed appendicitis or advanced appendicitis (including gangrenous, perforated, appendix abscess or an appendix mass treated conservatively with subsequent interval appendicectomy). Complications were also recorded. The duration of symptoms prior to admission to our unit was calculated. The time from admission to appendicectomy and hospital length of stay (fHLOS) were recorded.

Two categories are made by dividing patients into two groups.
Group 1- Since the onset of their symptoms patients had received. Initial diagnosis information requiring antibiotics, duration of antibiotic treatment of patient prior to the diagnosis of appendicitis, route of administration.

Group 2- Prior to admissionpatients did not get antibiotics.
All the patients were enrolled after written and informed consent. Detailed patient history was recorded. Thorough general and systemic examination was carried out. All findings were recorded in the Patient's Proforma.

The data was collected with the help of standard pre-validated case record proforma, after the institutional ethical committee clearance.

Data was entered in using Microsoft Excel software and analysed with the help of Open-epi software. Descriptive statistics was explained by frequency and percentage with the help of tables and graphs. Tests of significance (t-test and Anova test) were applied to draw the conclusions. P-value less than 0.05 were considered as significant.

RESULTS

In the present study, we had enrolled 55 patients of acute appendicitis who had received antibiotics since the onset of their symptom in group 1 and 55 patients of acute appendicitis who did not received antibiotics were included in group 2. There were 58% girls in group 1, compared with 62% in group 2. Majority of the cases belonged to age group of 8-16 years in group 1 and 2. (Table 1) (Table 2)

Table 1 Distribution of acute appendicitis cases according to their gender

Gender	Group 1	Group 2
Male	23 (41.81%)	21 (38.18%)
Female	32 (58.18%)	34 (61.81%)
Total	55 (100%)	55 (100%)

Table 2 Distribution of acute appendicitis cases according to their age

Age group	Group 1	Group 2
< 4	2 (3.63%)	1 (1.81%)
4-8	12 (21.81%)	10 (18.18%)
8-12	22 (40%)	23 (41.81%)
12-16	19 (34.54%)	21 (38.18%)
Total	55 (100%)	55 (100%)

Fever was present in majority of patients in group 1 as compared to group 2. (Table 3) Abdominal tenderness was found more among group 1 patients as compared to group 2 patients. 58% of group 1 and 65% of group 2 patients had nausea or vomiting. Dysuria was present in 11% of group 1 versus 9% of group 2. Diarrhoea was observed in 27% of group 1 contrasted with 14% of group 2. Respiratory complaints were more in group 1 as compared to group 2 patients (Table 3).

Table 3 Distribution of acute appendicitis cases according to their clinical presentation

Clinical presentation	Group 1	Group 2
Fever	49 (89.09%)	35(63.63%)
Abdominal tenderness	52 (94.54%)	46 (83.63%)
Nausea/Vomiting	32 (58.18%)	36 (65.45%)
Diarrhea	15 (27.27%)	8 (14.54%)
Dysuria	6 (10.9%)	5 (9.09%)
Breathlessness	12 (21.81%)	2 (3.63%)

The rates of early (non-perforated) appendicitis are shown in Table 3 together with the complication rates. The most common complicationswere abscess formation and wound infection (19% in group 1 and 9% in group 2). Other complications included a faecal fistula, early small bowel obstruction, prolonged diarrhoea and chest infection. Group 1 patients received antibiotics for presumed UTI, pneumonia cases), throat or ear infections.

Sub-group analyses were performed to examine the effects of three potential confounding factors: age, disease progression and antibiotics for less than 24 hours (Tables 3, 4, 5).

Table 4 Distribution of acute appendicitis cases according to their clinical profile

Clinical presentation	Group 1	Group 2
Early diagnosed	3 (5.45%)	26 (47.27%)
Clinically diagnosed	25 (45.45%)	40 (72.72%)
Non specific abdominal signs	23 (41.81%)	18 (32.72%)
Complications	14 (25.45%)	7 (12.72%)

DISCUSSION

In the developing countries like India, where there isd a scarcity of resources, and most of the Indian population lives in villages where speciality health care is seldom available. Patients with abdominal pain have to visit to general practitioner only. Each clinician elicits the history and physical findings and calculates a diagnosis and differential diagnosis. The clinical choice then is to pick between a diagnosis that fits perception or treatment with antibiotics, or alternatively referring the patient for surgical assessment. Unfortunately delay in referral while treating an alternative diagnosis increases the risk of perforation and subsequent morbidity. This study aimed to address the question of whether the administration of antibiotics per se delays the diagnosis of appendicitis in addition to delays incurred from pursuing an incorrect diagnosis.

In the group of children receiving antibiotics, There was a noteworthy decrease in moderate to severe localized delicacy. However, this difference became insignificant in the subgroup analyses looking at only older children and children with advanced appendicitis. With the caveat that clinical signs are

somewhat subjective, the results do suggest blunting of the clinical signs in children who have received antibiotics. As an immediate outcome, a clinical conclusion was made in less patients accepting antibiotics with more noteworthy dependence on radiological finding. In this studyfindings affirmed that Most children with appendicitis will have a fever and raised inflammatory markers. For the hypothesis that prior treatment with antibiotics diminishes this acute phase response, no support was found. Unexpectedly, in spite of the fact that TLC levels were comparative in the two gatherings, more noteworthy rises in temperature and CRP in the youngsters were discovered beforehand treated with antibiotics.Sub-group analysis confirmed the impression that this reflected the increased rate of advanced appendicitis likewise seen in those taking antibiotics. Although antibiotics can be used to treat appendicitis without recourse to surgery [12], it is clear that the antibiotics used in the children we studied, directed at the treatmentof alternative diagnoses, the sepsis of appendicitis is not adequately treated.The influence of antibiotic treatment whileevaluating patients with RIF pain have been remarked by any authors. Stringer *et al*. [11] highlighted the difficulties inassessing young children presenting with non-specific symptoms and poorly localized signs who had received prior antibiotic treatment. In a North American investigation of pre-school youngsters with an infected appendix, it was noticed that 57% had been seen at a before organize in their sickness and treated with antibiotics, antipyretics or antihistamines [12]. This resulted in an 83% perforation rate compared with 36% perforation rate in children who had been referred directly. Stone *et al*. surveyed factors associated with complications after advanced appendicitis and commented on the difficulties faced by clinicians when assessing a young child. They remarked, ‘‘[antibiotics] usually improve the child’s general condition until fulminating peritonitis or toxicity from an abscess forces a change to a different method of management’’ [13]. Landes *et al*. [18]. compared 11 patients with appendicitis, between the ages of 18 and 27 years, who had been taking tetracycline for acne for at least one month, with 100 patients also giving an appendicitis yet not taking antibiotics .They discovered lower rates of sickness, bounce back delicacy, temperature and white cell check in the patients taking antibiotics agents contrasted with controls. The overall perforation rate was 7% in this study and they suggested that antibiotics might have reduced the perforation rate. Although interesting, this study is not directly comparable to ours and it may be that long-term antibiotic treatment is less relevant clinically to the diagnosis of appendicitis.

CONCLUSIONS

This paper provides evidence to support the contention that patients who have received antibiotics prior to a definitive diagnosis of appendicitis are at increased risk of perforation and complications. The reasons appear to be multi-factorial. There is clearly a delay in referral due to the pursuit of an alternative diagnosis and there is some evidence, albeit subjective in nature, that antibiotics blunt the clinical signs of appendicitis. It turns out to be more hard to make a clinical analysis of an appendicitis in a kid on antibiotics, an impact which is autonomous of whether the appendix is perforated or not. The intense stage response to acuteresponse isn't blunted, rather corresponding with illness progression. Caution should be exercised starting children with abdominal pain on antibiotics empirically unless there is overwhelming evidence in favour of an alternative diagnosis to early acute appendicitis. Surgeons asked to see children with abdominal pain who have received antibiotics should think twice before discounting the possibility of acute appendicitis.

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