Does nonperforated appendicitis need antibiotic cover in children?

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ABSTRACT

Objective: A retrospective study to evaluate and compare the effects of antibiotics and no antibiotics in the treatment of simple acute appendicitis in children.

Methods: One hundred and thirty eight children with non-perforated acute appendicitis in Qatif Central Hospital, Division of Pediatric Surgery, Department of Surgery were evaluated. 98 received antibiotics and 40 did not receive antibiotics.

Results: The post-operative fever was observed in 51 (52%) of those who received antibiotics compared to only 9 (22.5%) in those who did not receive antibiotics. Two (2%) of those who received antibiotics developed wound infection compared to 1 (2.5%) of those who did not receive antibiotics. None of either groups developed intestinal obstruction but one of those who did not receive antibiotics developed intraabdominal abscess. Sixty-nine (70.4%) of those who received antibiotics and 36 (90%) of those who did not receive antibiotics went home within 5 days of admission, whereas 29 (29.6%) of those who received antibiotics and only 3 (7.5%) of those who did not receive antibiotics stayed in hospital for periods between 6 and 10 days.

Conclusion: Non administration of antimicrobials to children with non-perforated acute appendicitis did not in anyway increase morbidity, but on contrary it reduced hospital costs by way of less medication and shorter hospital stay. Add to this the less inconvenience to the family.

Keywords: Acute appendicitis, children, antibiotics.


Acute appendicitis remains the most common condition requiring emergency surgery in children, which not uncommonly can be associated with various complications. Wound infection remains the commonest. To overcome this, prophylactic antibiotics have been used, but the use of antibiotics in acute appendicitis whether preoperatively, perioperatively or post operatively has always been a controversial subject, and several questions still remain unanswered. Whether a single antimicrobial agent is sufficient and if so should prophylaxis be directed against anaerobic or aerobic bacteria or both and whether antibiotic prophylaxis is really necessary in children with simple acute appendicitis? In this paper, we outline our experience with 138 consecutive cases of non-perforated acute appendicitis, where 98 were treated with antibiotics and 40 without antibiotics.

Methods. During a 7-year period from 1989 to 1996, 204 children with the diagnosis of acute appendicitis were admitted to our hospital. The medical records of these patients were reviewed and information transferred to a proforma which included details of symptomatology, clinical and operative findings, microbiological yield, antimicrobial therapy if any, and complications encountered both immediate and remote. The use of antibiotics in terms of the type of antibiotics as well as the duration of treatment were the treating surgeons choice. The

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Antibiotics for childhood appendicitis ... Al-Salem et al

immediate complications looked for were postoperative fever, wound infection, intra-abdominal and pelvic abscess and intestinal obstruction. Remote complications looked for included adhesive intestinal obstruction and recurrent abdominal colic. The number of days in hospital was also recorded so as to estimate the morbidity of the patient and inconvenience to the family.

Results. Out of 204 children less that 12 years of age admitted with the diagnosis of acute appendicitis, 5 were not operated and so were excluded. The remaining 199 had appendectomy of whom 29 (14.6%) were found to be normal and 32 (16%) had perforated appendicitis. Of the remaining 138 children with non-perforated appendicitis, 98 received intravenous antimicrobial treatment pre, per or post operatively, whereas 40 did not receive any antimicrobial therapy. The various antimicrobials given and their doses are shown in Table 1. There were 68 males to 30 females in the antimicrobial group (AMG) and 30 males to 10 females in the non-antimicrobial group (NAMG). Preschool children (1-5 years) constituted 11 (11.2%) in the AMG and 3 (7.5%) in the NAMG, whereas school children (5-12 years) formed the rest. The duration of symptoms, localization of pain and tenderness as well as preoperative leukocyte counts were similar in both groups. All appendectomies were examined histologically and the presence of transmural inflammation was confirmed. Culture of exudate from peritoneal cavity yielded pathogenic organisms in 25 of the AMG and 5 of the NAMG but this finding did not in anyway influence the antibiotic use since antibiotic therapy was started before culture reports were through. Several types of organisms were cultured but E.coli was the commonest. Fifty-five of the AMG and 18 of the NAMG did not grow any organisms in culture whereas culture reports were not available in 18 of the AMG and 17 of the NAMG. However it must be acknowledged that the presence of infective exudate in the peritoneal cavity may have influenced the surgeon in the decision to use antimicrobial therapy.

Post-operative complications. Fever was the commonest post-operative complication, 51 (52%) of the AMG and 9 (22.5%) of the NAMG developed post-operative fever. Wound infection was present in 2 (2%) of the AMG and 1 (2.5%) in the NAMG. One of the NAMG developed intra-abdominal abscess which was drained. None of either group developed intestinal obstruction. No late complications were noted in either group, nor was there any mortality. Sixty-nine (70.4%) of the AMG and 36 (90%) of the NAMG went home within 5 days of admission whereas 29 (29.6%) of the AMG and 3 (7.5%) of the NAMG stayed in the hospital between 6 and 10 days. The mean length of hospital stay was 4.2 days for the NAMG and 6.8 days for the AMG. The patient in the NAMG who developed intraperitoneal abscess stayed more than 10 days.

Discussion. Acute appendicitis which is the most common surgical emergency in children is known to be associated with post-operative complications. Wound infection remains the most common cause of morbidity in these patients. In an attempt to reduce the incidence of post-appendectomy wound infection various methods have been used including the use of different combinations of antibiotics.1 It is widely accepted that an antibiotic prophylaxis is beneficial in reducing wound infection in uncomplicated cases of acute appendicitis.1 However, these are based mainly on studies done in adults and the number of publications dealing with this in children is limited. Most studies in children address the subject of complicated appendicitis.4,5,6,7,8,9

The controversies in the management of complicated appendicitis continue, but most current series both in adults and children agree on the benefit use of antibiotics in such cases.1,10 A wound infection rate between 0% and 3.4% and an intra-abdominal abscess rate between 1.1% and 1.8% has been reported recently in children with complicated appendicitis treated with antibiotics.5,6,7,8,9 Current series advocate routine use of broad spectrum antibiotics for complicated appendicitis and various antibiotic combinations have been used but mostly triple antibiotics (Ampicillin/Gentamycin/Clindamycin5,6,8,9,11 or Ampicillin/Gentamycin/Flagyl12,13) or just Gentamycin and Clindamycin12,13, although recently Flagyl alone was shown to be as effective.14 Whereas the value of antibiotics is well established in complicated appendicitis, controversies still

Table 1 - Antimicrobial cover for those with simple acute appendicitis

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>No antibiotics</td>
<td>40</td>
</tr>
<tr>
<td>Metronidazole Alone (7.5mg/kg/dose)</td>
<td>49</td>
</tr>
<tr>
<td>Ampicillin (100mg/kg/day) or Cephalosporine Alone (100mg/kg/day)</td>
<td>7</td>
</tr>
<tr>
<td>Ampicillin (100mg/kg/day), Gentamycin (5mg/kg/day) &amp; Metronidazole</td>
<td>32</td>
</tr>
<tr>
<td>Other combinations</td>
<td>10</td>
</tr>
</tbody>
</table>

Saudi Medical Journal 1998; Vol. 19 (4) 400
continue in their value in children with simple acute appendicitis, and whether antibiotic prophylaxis is really needed. This is because acute appendicitis in children is different from that in adults. It is well known that acute appendicitis in children has a more rapid course and higher incidence of perforation, but at the same time the incidence of post-operative wound infection as a whole after any kind of operation is lower in children than adults. Although our patient population is small, we have found like others that in simple acute appendicitis in children the use of prophylactic antibiotics is not required. Post-operative fever as well as wound infection were not significantly different whether antimicrobials were administered or not. On the contrary, it was found that fewer patients suffered from post-operative fever in the NAMG. Furthermore, the hospital stay was significantly reduced by not opting to give antimicrobials. So in children with simple acute appendicitis, non use of prophylactic antibiotics not only did it not in any way increase the morbidity, but on the contrary reduced the hospital stay be way of less medications and shorter hospital stay. Add to this the reduced cost and less inconvenience to the family.

References