Case Study

Shigellosis associated with appendicitis and peritonitis

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Appendix perforation is one of the many causes of secondary peritonitis. In this report, a case of peritonitis caused by Shigella sonnei in a 7-year-old child was presented. A 7-year-old male patient was presented with tenderness in the right lower quadrant and positive rebound tenderness test on physical examination. Abdominal ultrasonography and computed tomography revealed appendicular colitis and intraabdominal free fluid. The patient underwent surgery, during which perforation of appendix was noted. During the post-operative period, peritonitis developed. S. sonnei was isolated from peritoneal fluid secondary to perforation of appendix. Association of S. sonnei and appendicitis along with secondary peritonitis should be kept in mind when treating patients with abdominal pain and gastroenteritis.

Key words: Appendicitis, peritonitis, Shigella sonnei.

INTRODUCTION

The Shigella group of bacteria may cause the infectious disease, Shigellosis. There are several different kinds of Shigella bacteria. Shigella sonnei is also known as “Group D” Shigella. Appendicitis that develops during intestinal infections with Shigella has been frequently reported in the literature. Although no bacteriological evidence has been identified, this probability was observed during dysenteric outbreaks in American and English unions by Graham (1944) and Cowan (1958). White et al. (1961) reported 12 pediatric patients who were operated for appendiceal peritonitis at Birmingham Children Hospital during an epidemic caused by Shigellosis in England. In these patients, S. sonnei was present in peritoneal exudates and stools.

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Tovar et al. (1983) observed concomitantly appendiceal perforation and shigella enteritis in a 5-year-old boy and recovered the S. sonnei from peritoneal exudate and faeces. Dogukan et al. (2000) reported S. sonnei peritonitis in a 65-year-old diabetic on continuous ambulatory peritoneal dialysis (CAPD). Phillips (1969) described a patient who developed an appendix abscess after an 8-day delay in diagnosis. Sanders et al. (1972) reported a case with isolation of shigella from a perforated appendix. As Manatsathit et al. (2002) pointed out, careful history and physical examination is necessary to exclude these conditions from the commonly diagnosed ‘acute diarrhea’. Special attention should be paid to exclude signs of peritonism or peritonitis, which indicates serious illnesses that might require surgical care.

Herein, a peritonitis case caused by S. sonnei in a 7-year-old male with perforated appendix is reported. Though association of Shigella and appendicitis is not common, this possibility should be kept in mind for patient management.

Case report

A 7-year-old male was admitted to the Emergency Department of Adiyaman University Education and Research Hospital with complaints of pain, especially in the lower right abdominal quadrant, nausea, vomiting and diarrhea, which had persisted for two days. The patient had tenderness in the right lower quadrant and positive rebound tenderness test on physical examination. The patient underwent ultrasonography. In order to rule out perforation, computed tomography was performed which revealed appendicular colitis and intraabdominal free fluid (Figures 1 and 2). The patient was hospitalized in the Pediatric Surgery Department.

During the operation, perforation of appendix was noted and peritoneal fluid was sampled. The sampled material was inoculated in BacT/ALERT PF standard aerobic pediatric automotised blood culture. Subculture passage inoculations were performed in 5% sheep blood agar and EMB media from the blood culture bottle, in which a positive result was obtained. Following a night inoculation at 37°C, growth in the plaques was evaluated. The morphology of bacteria origins that grew in the subcultures was Gram-negative bacilli (Figures 3 and 4).

Then identification and antimicrobial sensitivity tests of the growing Gram negative origins were studied with Vitek 2 Compact (BioMerieux, France) automated system. The test result was reported as S. sonnei and an agglutination test with monovalent specific antiserum was conducted on the reported bacteria and the automated identification of the species was serologically confirmed.

In the pathological examination of the intraabdominal fluid and appendix, findings of acute appendicitis and perforation were noted, with peritonitis and dense neutrophilic infiltration with dense mixed inflammatory cell
infiltration rich in neutrophiles and eosinophiles. A fibroblastic reaction was observed (Figures 5 and 6).

Ampicillin sulbactam was initiated. At the postoperative second day, the patient had fever and the infectious disease department recommended ceftriaxone. As the diarrhea recovered, stool microscopy and culture were not completed. At the postoperative third day, the drainage tube was removed, as the patient had no draining fluid. When the patient tolerated oral feeding and was without fever, he was discharged with recommendations.

**DISCUSSION**

Peritonitis can develop as a result of inflammatory, infectious and ischemic injuries, and perforation of gastrointestinal and genitourinary systems. Among the Gram negative agents, species that are members of *Escherichia coli*, *Klebsiella* sp., *Proteus* sp., *Pseudomonas* sp. and *Enterobacter* sp. genus are the dominant species in the etiology. Among anaerobic bacteria, *Bacteroides fragilis*, *Clostridium* species and *Peptococcus* species are identified as causative agents. The causative agents in peritonitis that develop following appendix, colon, or rectum originated infections are generally Gram negative or anaerobic bacteria. In the present case, peritonitis developed secondary to *S. sonnei*. *S. sonnei* was isolated in the peritoneal fluid as a result of appendix perforation in a patient presenting with diarrhea and right lower quadrant pain.

Review of the literature shows that there are several case reports describing association with appendicitis and Shigellosis. Even though many case reports date prior to 21th century, there are a few recent case reports. Huynh et al. (2015) reported a 34-year-old man presented with a 6-day history of diarrhea, abdominal cramps and fever and testing the initial blood culture correctly identified the organism as *S. sonnei*. Special attention should be paid to exclude signs of peritonism or peritonitis, which will indicate serious illnesses that might require surgical care. As reported recently in literature of Ghosh et al. (2011), there is a risk of epidemic due to nalidixic acid resistant *S. sonnei* in the near future. This might pose therapeutic challenges in treatment of such cases.

**Conflict of interests**

The authors did not declare any conflict of interest.

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