Adult Infected Salmonella Complicated with Appendicitis
Chung-Yen Lin¹ MD, Hsuan-Chu Hsu²,³ MD, Chi-Yi Lin¹ MD, Hong-Ming Chao¹* MD
¹Division of General Surgery, Department of Surgery, Taoyuan Armed Forces General Hospital, Taiwan
²Department of Medicine, Yangming Branch, Taipei City Hospital, Taipei, Taiwan
³Department of Medicine, Taipei Veterans General Hospital, Taiwan
*These authors contributed equally to the paper
*Corresponding author: Dr. Hong-Ming Chao MD, Division of General surgery, Department of Surgery, Taoyuan Armed Forces General Hospital, Taiwan, No. 168, Zhongxing Road, Longtan Dist, Taoyuan City, Taiwan, Tel: 886-3-4799595; Email: simply73813@gmail.com
Received: 05-21-2015
Accepted: 09-15-2015
Published: 10-02-2015
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Abstract
Salmonella is transmitted via a variety of consuming contaminated food products or water. The incidence of non-typhoidal Salmonella infection increased steadily in the past two decades. Enteric infection in many people is clinically mild and self-limited or even asymptomatic. However, some serious complications have been reported in children. This report described a case of adult woman who presented with symptoms including right lower quadrant abdominal pain, nausea and vomiting, fever, and diarrhea for one day at emergency room. The patient was admitted for laparoscopic appendectomy, and the stool culture confirmed Salmonella group D infection. She is a mother of two sons, very robust without any past medical history before this admission. Still, adult patient infected with Salmonella gastroenteritis may develop intra-abdominal complication like acute appendicitis. The diagnosis can be missed easily because there are some overlap symptoms in between, and patient may receive inadequate antibiotic treatment. To obtain the correct diagnosis and improve the quality of clinical care, Salmonella infection should take into consideration in patient with acute appendicitis, and contact history of contaminated food, collections of stool/blood culture, appropriate antibiotic therapy are all necessary.

Keywords: Salmonella infection; acute appendicitis; appendectomy

Introduction
Appendicitis is the most common abdominal surgical emergency. The peak incidence is in the second and third decades of life. The disease is believed to occur as a result of appendiceal luminal obstruction, commonly by a fecolith, which results from accumulation and inspissation of fecal matter around vegetable fibers; or appendiceal ulceration, a viral etiology has been postulated.

We encountered an adult case that involved typical presentation of acute appendicitis. On admission, the patient received appendectomy and antibiotic treatment. The diagnosis later on was established Salmonella infection by stool culture. Salmonella gastroenteritis is frequent, but developing complication as appendicitis is rare and usually recognized in children. We are unaware of any previous reports of Salmonella infection related acute suppurative appendicitis in adult.

Case Report
The patient is a 49-year-old female who had been well without any past history until 1 day prior to admission when she developed nausea, vomiting, diarrhea and fever. Physical examination found tenderness with muscle rigidity in the right lower quadrant of the abdomen and decreased bowel sounds. Her body temperature was 38.5°C, the respiratory
rate 20 breaths per minute, the pulse 111 beats per minute, and the blood pressure 108/78 mmHg. The laboratory findings were as follows: hemoglobin level 12.5 g/dl, white blood cell count 18220/mm3, platelet count 237,000/mm3, C-reactive protein 13.4 mg/dl, stool routine revealed WBC 26-45/HPF.

On the basis of the symptoms and initial test results, antibiotic with piperacillin/tazobactam 4.5g/Q8H was administered immediately at emergency room. Due to progressive abdominal tenderness in right lower quadrant, a provisional diagnosis of acute appendicitis was made and the operation of laparoscopic appendectomy had been undertaken. The appendix appeared edematous and inflamed on gross examination during the operation. A huge uterine leiomyoma with small amount of colorless ascites was also noted. Otherwise, the intestinal tract wasgrossly normal.

Histopathologic examination of the tissue sections showed local peritonitis and acute suppurative appendicitis, composed of intraluminal abscess with dense inflammatory cells transmural infiltration. The patient’s stool culture yielded Salmonella group D. We maintained antibiotic treatment in the following one week post appendectomy. The patient’s hospital course was uneventful and she was discharged on day 6 post-surgery.

Discussion

Bacteria of the genus Salmonella are adapted for growth in humans and cause diseases. S. typhi and S. paratyphi can cause typhoid fever; and the remaining serotypes colonize in the gastrointestinal tracts, often causing gastroenteritis and can be associated with localized infection or bacteremia.

Transmission of Salmonella is most commonly associated with animal food products, especially eggs, poultry, under-cooked ground meat, and dairy products. Nausea, vomiting, and diarrhea occur 6-48 hours after the ingestion of contaminated food or water. Our patient had been reported that her two sons had similar symptom of vomiting and diarrhea between the day 4 and day 6 post-surgery. Our patient had been reported that her two sons had similar symptom of vomiting and diarrhea before her admission. However, gastroenteritis resulted from infection of Salmonella is clinically indistinguishable from that caused by many other enteric pathogens.

Non-typhoidal Salmonella is characterized by an infiltration of mononuclear cells into the small-bowel mucosa. This response depends on the induction of interleukin-8, which is secreted by intestinal cells as a result of Salmonella translocation of bacterial proteins into host cell cytoplasm. The degranulation and release of toxic substances by neutrophils may result in damage to the intestinal mucosa, causing the inflammatory diarrhea. However, diarrhea is a relatively atypical symptom in patients with acute appendicitis.

Salmonella gastroenteritis is self-limited, but stool cultures remain positive for 5 weeks. Antibiotic treatment did not use routinely to treat uncomplicated gastroenteritis for prolong fecal carriage and increased rates of relapse; but, should be considered for patients at increased risk including neonates, the elderly, and patients with immunosuppression, cardiac valvular disease, and significant joint disease. Though our patient is not belong one of these populations, previous cohort study showed ingested dose was an important determinant of the incubation period, symptoms and severity of acute salmonellosis [1]. She not only needs antibiotic treatment due to abscesses formation but also requires surgical correction for acute suppurative appendicitis.

Salmonella subspecies can be classified into more than 2500 serotypes according to the somatic O antigen, the surface Vi antigen, and flagella H antigen. Most laboratories perform a few simple agglutination reactions that define O-antigen serogroup, designated A to E [2]. Serotype distribution varies greatly by location and over time. S. enteritidis, S. newport, and S. typhimurium are now the serotypes most frequently isolated in the United States. And, Salmonella enteritidis (serogroup D) is the most common cause of salmonella gastroenteritis.

American textbooks of internal medicine was written that patients develop localized infections should receive 14-28 days of intravenous or oral antibiotic therapy. However, intra-abdominal infections are usually manifest as hepatic or splenic abscesses or cholecystitis. It contains little information regarding the treatment of Salmonella infection complicated with appendicitis. Since surgical resection provides much eradication of bacteria, we gave intravenous antibiotic treatment another 7 days.

Fluoroquinolone or third-generation cephalosporins are the first-line antimicrobial agents for invasive Salmonella infection. We chose piperacillin/tazobactam empirically for its activity against gram-negative rods and anaerobic organisms when the diagnosis of acute appendicitis is in question. A Korea investigation shows the antimicrobial resistance rate is increasing, and ESBL-Salmonella are not uncommon now [3]. Overall, the salmonella strains had 8.6% rate of resistance to ceftriaxone. Laboratory should alert and perform more sophisticated test to recognize strains potentially bearing beta-lactamase resistance elements in the future.

We would like to draw further attention to the combination of appendicitis and salmonella infection in adult because the incidence of non-typhoid Salmonella infection and the antimicrobial resistances are climbing around the world. Previous published reports all indicated patient in teenage [4-7]. Some cases admitted with typical picture of acute appendicitis and received surgery. Not aware of Salmonella infection and discharged after appendectomy, they re-admitted or prolonged hospitalization due to persisted fever or abdominal pain. A retrospective diagnosis of Salmonella infection depends on the stool or blood culture at beginning. It is important for these specimen collections whenever patients have related symptom.

References


