

SALMONELLA INFECTION IN AN ELDERLY PATIENT

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Summary

A 76 years old lady with salmonellosis was reported. She presented to us diarrhoea, hip pain and low back pain. Although appropriate antibiotics were started early on, she remained unwell within persistent hip and back pain. Urgent ultrasound and CT abdomen confirmed aortic aneurysm. Urgent laparotomy was performed. Unfortunately the lady died despite operation. Histology and microbiological study confirmed mycotic aneurysm secondary to salmonella infection. Case as presented and literature reviewed. .

Keywords: aortic aneurysm, elderly, salmonella

Introduction

Nontyphoidal Salmonella infection is widely disseminated in nature and may occur at extraintestinal sites causing meningitis, osteomyelitis, septic arthritis, or endovascular infection¹. Bacteremia may follow an episode of salmonella gastroenteritis. Particular vulnerability of the elderly to bacteremia is related not only to debilitating states or underlying diseases but also to a decrease in cell-mediated immunity². We reported a case that suffered from complications of salmonella infection and died subsequently.

Case report

A previously well 76 year old lady was admitted to the hospital with a 3 week history of fevers, rigors and lethargy. She had loose watery mucous diarrhoea up to 10 times a day and frequent vomiting at the onset of the symptoms lasted for a week. This occurred after eating the turkey cooked by her husband the day before. There was no history of recent travel. She did not see her local doctor and was not taking anything for her symptoms prior to her hospital visit. She developed left hip pain and lower back pain on the day of admission. On examination she appeared very unwell, dehydrated, hypotensive with blood pressure of 89/57 mmHg and temperature of 39.7 °C. Her pulse rate was 76/min irregularly irregular. There was mild

tenderness on the left renal angle and examination of other systems was unremarkable.

She had a background history of hypercholesterolaemia and was not on any medication.

Laboratory data revealed: white blood cell count (WBC) 9540/mm³ with 93.2% neutrophils, total bilirubin 23 umol/L (0-17), alkaline phosphatase 126 U/L (25-110), gamma GT 40 U/L (0-30), AST (SGOT) 45 U/L (5-35), total protein 55 g/L (63-80), albumin 23 g/L (35-55), troponin I 0.1 ug/L (<0.1), CRP 187 mg/L (<10) and blood cultures 3/4 bottles were positive for Salmonella sp., Serogroup B sensitive to Ampicillin, Ceftriaxone, Cefotaxime, Ciprofloxacin and Timentin.

Stool cultures yielded identical organism with similar sensitivity.

Her ECG on admission showed atrial fibrillation with a controlled rate of 90 bpm.

She was commenced on IV Ceftriaxone 1G and IV Gentamicin 240mg daily.

Despite the therapy she remained unwell with intermittent high temperature up to 38.2 °C and ongoing abdominal and lower back pain. Subsequent investigations revealed a 5cm abdominal aortic aneurysm containing eccentric mural thrombus on the ultrasound. The night before she was due to have the CT scan of the abdomen and pelvis she went into cardiogenic shock with severe hypotension, abdominal and back pain. She underwent emergency surgery for ruptured abdominal aneurysm. It was discovered that she had a large tear in left lateral wall of infrarenal saccular aneurysm. During surgery, she had a cardiac arrest, which was unresponsive to cardiopulmonary resuscitation. Her ECG at the time was unchanged. The aneurysm wall scrapings taken at the time of surgery yielded sensitive Salmonella sp., Serogroup B.

Discussion

Salmonella is an enteroinvasive bacterium which may present in five different clinical forms. Self-limited gastroenteritis usually characterised by

diarrhoea and fever is the most common presentation in industrial countries³. Bacteremia-septicemia without localizing infection or focal infections, extraintestinal non-typhoidal infections affecting different sites of the body, typhoid fever and chronic carrier state are other forms of clinical presentation. In the developed world salmonellosis is most intimately associated with poultry and eggs. This is acquired by the practice of cooking the poultry slowly at low temperature, especially when the bird cavity is stuffed with foodstuffs that may support growth of organisms. Salmonella can be transmitted transovarially from chickens to eggs and, intact fresh eggs represent a risk⁴. Factors such as intensive pig and poultry production are contributing to the emergence of new clones of Salmonella pathogenic to humans³. Our patient and her husband both ingested the cooked turkey and she was the only one who contracted the infection. This indicates the possibility of a sporadic case from ingesting differing doses of salmonella. There was no history of prior ingestion of gastric acid-lowering agents in the four weeks before the onset of illness, which has been demonstrated to be associated with salmonella infection in the case-control study⁵.

Extraintestinal salmonellosis frequently affected patients with some predisposing factors and/or underlying disease than patients without these features in 2:1 ratio³. The majority of the cases are due to *S. enteritidis* and account for approximately 30% of infected abdominal aortic aneurysm^{6,7}. The aorta is more susceptible to the development of endovascular infection in the presence of atherosclerosis with or without aneurysmal changes⁸. The bacteremia following an episode of Salmonella gastroenteritis (secondary bacteremia) may occur in 5-14% of patients⁹. The risk of an endothelial infection from Salmonella bacteremia in patients over 50 years has been estimated to be 25%¹⁰. Our patient had infrarenal aneurysm which is the most often involved site¹.

Computed tomography appears to provide earlier diagnosis and a good technique to follow the progress of this disease if the diagnosis is not initially made⁸. Unfortunately, our patient did not have the CT scan to evaluate the extent of the aneurysm. Since the time of admission the patient received the antibiotics for which the organism was sensitive to but unfortunately, she succumbed to fatal complication. The outlook with medical therapy is disastrous, and aggressive surgical treatment is advocated for survival¹¹ as a tendency toward an early rupture has been noted in the cases

due to Salmonella infection⁸. In one series the overall mortality was reported to be 56% with a 100% medical mortality and 40% surgical mortality¹⁰.

Surgical intervention is individualized and patients with infected abdominal aortic aneurysms may need resection with thorough debridement¹². Methods of revascularization could be attempted by in-situ or extraanatomic bypass using arterial homograft in-situ or synthetic graft. Both the methods are however subject to complications¹³. There are no definite recommendations for the duration of postoperative antibiotic therapy, but a minimum of six weeks has been suggested. Lifelong oral antibiotics have been advocated depending on the method of arterial reconstruction and late reinfections have been reported with Salmonella mycotic aneurysms. Surgery performed after rupture carries high morbidity and mortality rates⁸. In one study the infected aortic aneurysms were seen exclusively in the older age group (50 years or older), and all deaths occurred in these patients¹². This emphasizes and reminds us the importance of clinical suspicion and early diagnosis especially in an elderly patient with salmonella bacteremia.

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LEARNING POINTS

- 1. Nontyphoidal Salmonella infection is widely disseminated in nature and may occur at extraintestinal sites.**
- 2. Aorta is a common site of involvement. High index of suspicion is required to make a diagnosis.**
- 3. Surgical intervention has to be considered in salmonella mycotic aneurysm.**

HOW TO OBJECTIVELY APPRAISE JOURNAL ARTICLES AND CONCISELY COMMUNICATE THE FINDINGS: THE P.I.C.O. METHOD

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When we read articles in medical journals, at times we all have experienced difficulty to understand or objectively appraise the evidence. I recently attended an Evidence Based Medicine workshop held locally. There was a tool there that was reasonably easy to remember and adopt as both an analytic approach and a concise way of communication.

This is the so-called P.I.C.O. method. A variety of primary articles, whether related to therapeutic intervention, diagnostic test, harm exposure or disease prognosis, can be evaluated generically using this approach. When we read such articles, the data in the method and result sections can be "dissected" into four essential components. First, define the population of interest. Second, define the intervention, test, harm exposure or disease of

interest. Third, define the alternative treatment, diagnostic standard, or comparison group. Fourth, define the outcome (death, morbidity, etc).

Examples for illustration can be as followed. Intervention trial: to study among adult insulin-dependent diabetics (P) that whether tight control with multiple insulin injections (I) can reduce mortality (O) when compared to twice-per-day injection (C). Diagnostic test: to evaluate in a general hospital geriatric medical population (P) whether serum ferritin (I) can establish or refute a diagnosis of iron deficiency (O) when compared with bone marrow aspiration (C).

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