

CASE BASED REVIEWS

Salmonella osteomyelitis and retropharyngeal, epidural abscess that developed under biologic therapy

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ABSTRACT

Salmonella is still observed as an infectious agent in developing countries, often causing gastrointestinal infections. Extra-gastrointestinal infections are rare and spinal infections are even rarer. This case report describes a patient with rheumatoid arthritis who is actively receiving biologic therapy, presented with dysphagia, recurrent fevers, back and arm pain, weight loss and weakness and was diagnosed with retropharyngeal and epidural Salmonella infection.

Keywords: Rheumatoid arthritis ; Neck; MRI; Adolescent rheumatology; Bacteria

INTRODUCTION

Salmonella can still be considered an infectious agent in developing and underdeveloped countries. More than 95% of Salmonella infections are foodborne. Transmission of Salmonella from animals, nosocomial infections and human-to-human transmission are less common¹. Non-typhoidal Salmonella is a species within the genus Salmonella and is one of the most common causes of diarrhea worldwide. It can also cause invasive bacterial disease in certain African countries. During the course of infection, bacteria can cause various manifestations such as bacteremia, osteomyelitis, mycotic aneurysm and infective endocarditis².

Risk factors for salmonellosis include pernicious anaemia, conditions that alter the intestinal flora, diabetes, malignancies, rheumatological conditions, use of immunosuppressive drugs and certain medications. Salmonella affects B cell lymphopoiesis, B cell activation and antibody production within humoral immunity. In particular, the later stages of humoral immunity play a crucial role in the response to bacterial infections³. Bacteria that cause infection, particularly in the absence of gastrointestinal symptoms, may signal to clinicians that the patient may be immunocompromised or have an anatomical defect that could facilitate bacterial transmission⁴.

The increased incidence of Salmonella infections in

patients treated with anti-TNF is well known. It has been suggested that this is because anti-TNF therapy interferes with the production of interferon⁵. Retropharyngeal epidural abscess caused by Salmonella is rarely described in the literature and is a very serious presentation. In this case report, we present a 73-year-old patient, diagnosed with rheumatoid arthritis, who presented with a retropharyngeal epidural abscess and osteomyelitis caused by Salmonella paratyphi A under etanercept therapy.

CASE REPORT

A 73-year-old female patient presented to the rheumatology outpatient clinic with widespread arm and back aches, recurrent fevers, dysphagia and weakness of two months' duration. On admission, the patient had no associated gastrointestinal symptoms. The patient had been diagnosed with rheumatoid arthritis 40 years previously and had a history of NSAIDs, leflunomide, hydroxychloroquine, corticosteroids, adalimumab and tocilizumab. There was no other accompanying systemic disease or chronic infection history and no medication use other than the treatments used for rheumatoid arthritis. No history of consumption of raw meat, recent international travel or contact with animals were noted. For rheumatoid arthritis, she was currently taking corticosteroids for 4 mg/day, leflunomide and etanercept. After noting the patient's history of weight loss and recurrent fevers, we decided to admit her to hospital for further investigation of possible malignancies and infectious conditions. Physical examination revealed joint ankylosis and finger deformities due to rheumatoid arthritis. No other significant features were

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Figure 1. Retropharyngeal abscess (*).



Figure 2. Transverse aspect of abscess.

noted. Blood samples taken from the patient showed the following results: Hb: 10 g/dL, CRP: 173 mg/L, erythrocyte sedimentation rate: 52 mm/h, WBC count: 21000/mm³, AST: 25 IU/L, ALT: 20 IU/L and procalcitonin within the normal range. A magnetic resonance imaging scan performed to evaluate for malignancy and possible tuberculosis, revealed a cervical epidural abscess (see image 1 and 2). This abscess was thought to extend from the retropharyngeal area at the level of the C4-5 disc and associated osteomyelitis was observed (Figure 2). Samples from the patient whose retropharyngeal abscess had been drained were sent for culture. The culture showed growth of *Salmonella* paratyphi A. In the antibiogram test, sensitivity to ampicillin, ciprofloxacin, ceftriaxone and trimethoprim sulfamethaxazole was reported. The patient underwent surgery by a neurosurgeon due to loss of sensation in her hands and feet during follow-up. *Salmonella* growth was also detected in samples taken from the epidural abscess. After surgery, the patient's follow-up was uneventful. The patient was prescribed ceftriaxone and ciprofloxacin under the supervision of infectious disease specialists. A blood sample taken after abscess evacuation showed a C-reactive protein level of 8 mg/L, a sedimentation rate of 36 mm/h and a WBC count of 8500/mm³.

DISCUSSION

While the majority of non-typhoidal *Salmonella* infections occur in people who are generally healthy, *Salmonella* species can induce various changes in the host defence system that result in increased susceptibility to

infection⁶. These conditions can make the initial infection more severe and lead to more serious outcomes such as bacteremia, development of infection in distant sites or prolonged infection. In this case, there was prolonged use of anti-TNF agents, leflunomide and corticosteroids. In a study focusing on the categorisation of extraintestinal non-typhoidal *Salmonella* infections, the results showed that the most common site of extraintestinal infection was the lower urinary tract (30%), followed by the respiratory system (20%) and the skeletal system (19%)⁷. Vertebral osteomyelitis is an extremely rare complication of non-typhoidal *Salmonella* infections and its global incidence is unknown⁸. In our case, the manifestations included a retropharyngeal abscess, a spinal epidural abscess and consequent destructive osteomyelitis.

A comprehensive analysis of *Salmonella* vertebral osteomyelitis involving 44 patients showed that back pain (92%) and fever (87%) were the predominant symptoms, while paravertebral abscess occurred in 39% of cases and epidural abscess in 4%. Of these patients, 72% responded well to medical treatment alone, while 28% required surgery⁹. In line with the literature, in our case there was recurrent fevers and back pain.

Other cases of *Salmonella*-induced epidural abscesses were reported in the literature. One patient was and diagnosed with sickle cell anaemia, the other had no medical conditions^{10,11}. In one of them, further investigation revealed the growth of *Salmonella* Altona in both the patient's blood and stool cultures and in this case, the abscess was drained eleven days after diagnosis¹². In our case, there was no evidence of *Salmonella* growth in the patient's blood and stool cultures. However, due to the patient's neurological deterioration, the neurosurgeon

on performed the abscess surgery three days after the initial diagnosis.

In fact, it's important to know that one study showed that only about 35% of patients with invasive non-typhoidal Salmonella infections have diarrhea, while about 40% have vomiting¹³. In our case there was no diarrhea or vomiting.

Considering salmonella infection in patients receiving biological treatment for rheumatological diseases, an intraosseous abscess caused by Salmonella in a patient with psoriatic arthritis during adalimumab treatment was reported in 2010 stating the possible effect on the abscess of adalimumab¹⁴. Another study found that although there was no significant increase in the incidence of Salmonella typhi infections in rheumatology patients on anti-TNF treatment, the occurrence of infection led to a higher rate of serious complications¹⁵. Salmonella septicemia was reported in other cases with rheumatoid arthritis (RA) undergoing anti-TNF treatment, attributed the occurrence to the potential for severe invasive infections resulting from factors such as the reduction of TLR-4 dendritic cells by TNF blockade, a decrease in IFN-gamma production and general suppression of the immune system^{16 5}.

In conclusion, we have presented a case of epidural abscess attributed to Salmonella infection, notable for the absence of gastrointestinal symptoms. In rheumatology patients undergoing anti-TNF therapy, atypical infections should be considered and that infections should be kept in mind when treatment response cannot be obtained, particularly in regions with a high prevalence of such infections.

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