Salmonella spondylitis in an immunocompetent non-sickle cell patient

Zaid B. Al Jebaje, Andrew Zhao, Mohammed Samannodi, Mohammed Al-Sofiani, Michael Hocko

ABSTRACT

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Case Report: We report a 25-year-old male who does not have any history of sickle cell anemia, corticosteroid use, or HIV who presented with back pain and constitutional symptoms suggestive of an ongoing infection. Laboratory workup, X-ray, magnetic resonance imaging, and fluoroscopic biopsy of the affected area helped establish the diagnosis and guide treatment options. The condition of patient improved after extended course of antibiotics.

Conclusion: Patients with Salmonella spondylitis typically present with back pain and fever. Initial diagnostic workup should include complete blood count (CBC), C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR) levels. X-ray can be used for initial imaging but MRI will better visualize the full extent of the infection while guided needle biopsy with cultures will distinguish the organism and its antimicrobial susceptibilities. Extended antibiotic coverage for 6–12 weeks is often needed and recommended.
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Keywords: Immunocompetent, Osteomyelitis, Salmonella, Spondylitis

INTRODUCTION

Salmonella is a gram-negative bacillus that is most commonly associated with gastrointestinal infections worldwide and typhoid/paratyphoid fevers in less developed countries. In addition, Salmonella can also rarely cause spondylitis, defined as osteomyelitis of the spine with destruction of the vertebral bodies, but it is associated with only 0.5% of all osteomyelitis cases [1]. The majority of said cases are frequently associated with patients with immunocompromised states, such as malignancies, long-term corticosteroid use, and sickle cell anemia. We report a case of a 25-year-old
immunocompetent non-sickle cell African-American male with chronic lower back pain diagnosed as *Salmonella* non-typhoidal spondylitis.

**CASE REPORT**

A 25-year-old African-American male presented to the Sisters of Charity hospital with complaints of progressively worsening lower back pain for six months. The pain started as mild back ache that did not have significant effect on the man's daily activities but gradually worsened, causing the patient to seek medical help. He visited multiple local healthcare facilities where he was diagnosed with muscle strain and treated with non-steroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants.

During the course of his progressive pain, the man started to notice increasing back stiffness and difficulty in walking. Two days prior to presentation, he also started experiencing fever, chills and generalized tiredness. The patient denied any recent trauma, weight loss, nausea, vomiting or diarrhea, or urinary symptoms. He also denied consumption of unpasteurized milk or undercooked poultry. Patient denies recently interacting with any known sick contacts. He had a negative past medical and surgical history and any history of illicit drug use or owning pet animals.

On examination, the patient had a temperature of 39.0°C, pulse rate 98 BPM, blood pressure 125/80 mmHg and respiratory rate 16 breaths/minute. On musculoskeletal examination, he had mild midline lumbar spine and para-spinal tenderness. Spinal range of movement examination revealed mild pain and stiffness on flexion. Hips were stable and straight leg raising test was negative bilaterally. Neurological examination and remainder of physical examination was unremarkable in its entirety.

Initial laboratory blood work were drawn and results returned as followed: hemoglobin 12.1 g/dL, hematocrit 37.1%, white blood cells count 8.6x10^3/ul, platelets 157x10^3/ul, C-reactive protein 108 mg/L and erythrocyte sedimentation rate 66 mm/hr. Renal and liver function tests were unremarkable, coagulation profile within normal range, and sickle cell screen negative. Hemoglobin electrophoresis was also normal. Cultures of blood, stool and midstream urine later returned negative. Serum anti-nuclear antibody (ANA), perinuclear anti-neutrophil cytoplasmic antibodies (pANCA) and cytoplasmic anti-neutrophil cytoplasmic antibodies (cANCA) were all negative. HIV testing results returned negative as well and CD4 count was within normal limits.

X-ray of the lumbar spine was negative for any bony erosion or soft tissue abnormality. Magnetic resonance imaging (MRI) scan of the lumbar spine showed enhanced abnormal signal involving L4 and L5 anteriorly with thickening of anterior longitudinal ligament and sparing of disc space a picture likely consistent with infectious spondylitis (Figure 1).

The patient underwent a fluoroscopy guided needle aspiration and biopsy of L4/L5 space and received intravenous ceftriaxone 2 g daily. The biopsy results returned positive for *Salmonella* non-typhoid group, sensitive to ceftriaxone and ciprofloxacin.

Basing the working diagnosis on spondylitis secondary to a *Salmonella* non-typhoid infection, our decision was to continue the patient on intravenous...
Salmonella with past cases [1, 4–9]. However, a complete blood cell sedimentation rate levels, which is once again consistent but did show elevated C-reactive protein and erythrocyte report himself did not have an elevated white cell count of blood cell count alone might not be as helpful in diagnosis lower back pain and fever because reliance on the white to the laboratory results of any patients presenting with (as several weeks may have passed).

At the same time, patients commonly did not recall recurrent fevers as their patients’ chief complaints [1, 4, 6–8]. The majority of case reports also mention back pain and fever present in 87% of cases and back pain 92% [5]. Review of current literature also supports this finding as an overwhelming majority of case reports also mention back pain and recurrent fevers as their patients’ chief complaints [1, 4, 6–8]. At the same time, patients commonly did not recall any previous history of typhoid fever or gastroenteritis (as several weeks may have passed).

The patient involved in this report suffered from progressive lower back pain, back stiffness, difficulty walking, and constitutional symptoms (fever, chills, and fatigue) later on. In the review by Santos and Sapico, fever and back pain were the main complaints in patients with Salmonella vertebral osteomyelitis, with fever present in 87% of cases and back pain 92% [5]. Review of current literature also supports this finding as an overwhelming majority of case reports also mention back pain and recurrent fevers as their patients’ chief complaints [1, 4, 6–8]. At the same time, patients commonly did not recall any previous history of typhoid fever or gastroenteritis (as several weeks may have passed).

Clinicians are also recommended to pay close attention to the laboratory results of any patients presenting with lower back pain and fever because reliance on the white blood cell count alone might not be as helpful in diagnosis of Salmonella spondylitis. The patient involved in this report himself did not have an elevated white cell count but did show elevated C-reactive protein and erythrocyte sedimentation rate levels, which is once again consistent with past cases [1, 4–9]. However, a complete blood cell count should still be ordered in concurrence with ESR and CRP levels as patients can have other underlying conditions that require medical attention.

In terms of imaging modalities, the initial X-ray of thoracic/lumbar spine can help establish the presence of any abnormalities in the bone and soft tissue. Common findings in spondylitis include osteolysis, end plate erosions, and narrowing of the disk space. However, MRI scan provides better visualization of the spread of the infection and involvement of the soft tissues, neural column, and bone structure. Afterwards, patients should undergo needle biopsy, either fluoroscopic or computed tomography guided, in order to definitively diagnose the involving organism prior to starting antibiotics. This step is paramount as treatment options can vary widely with different suspecting organisms, Amritanand reported a patient that was started on antituberculous therapy because her biopsy did not yield enough tissue but her condition continued to worsen [7].

As stated above, antibiotic therapy should be initiated based on the organism and susceptibilities identified via cultures. Various studies have advocated different lengths of the treatment courses, ranging from 4–12 weeks [2–9]. A literature review by Grados demonstrated recurrence rates that were two to three times higher in patients who received antibiotics for four to eight weeks when compared to those who were treated for 12 weeks or longer [10]. The presented patient underwent a total of 12 weeks of ceftriaxone during the initial six weeks and then ciprofloxacin for the reminder. Given the significant mortality associated with this condition, an extended antibiotic course of at least six to eight weeks should be considered along with close monitoring of both symptoms and inflammatory markers and a low threshold to reevaluate and restart therapy if symptoms return.

CONCLUSION

Although Salmonella osteomyelitis is extremely rare in immunocompetent patients, it should still be part of the differential diagnosis for patients with spondylitis. Patients presenting with fever and back pain should be evaluated for spondylitis. Initial blood work should include complete blood count (but anticipate that white blood cell count might not be elevated, C-reactive protein, and erythrocyte sedimentation rate. Diagnostic modalities include the initial spinal X-ray followed by spinal magnetic resonance imaging if indicated. Fluoroscopy or computed tomography guided needle aspiration with subsequent culture should be performed for definitive diagnosis. Patients with Salmonella spondylitis should receive antibiotics for at least six weeks with recommendations for 12 weeks or more.
Acknowledgements
We would like to thank Dr. Woodman for his kind assistance in the production of this manuscript.

Author Contributions
Zaid B. Al Jebaje – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Andrew Zhao – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Mohammed Sammanodi – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Mohammed Al-Sofiani – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Michael Hocko – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor
The corresponding author is the guarantor of submission.

Conflict of Interest
Authors declare no conflict of interest.

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