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Tuberculous Spondylitis in Patients with End-stage Renal Disease Undergoing Chronic Hemodialysis Therapy – Report of Two Cases

Case Report

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Abstract: Tuberculous spondylitis is more common in patients with chronic renal failure who receive hemodialysis because of their abnormal T-cell-mediated immunity. It frequently poses both diagnostic and therapeutic challenges. We describe two cases of tuberculous spondylitis in patients undergoing chronic hemodialysis therapy. They are IFN-γ assay diagnosed (QuantiFERON-TB Gold) and conservatively treated. Our cases suggest that IFN-γ assays equip clinicians with more accurate tools for tuberculosis control. A combination of T-SPOT.TB testing and MRI assessment may be the accurate method to diagnose tuberculous spondylitis in patients with end-stage renal disease.

Keywords: *Tuberculous spondylitis • End-stage renal disease • IFN-γ assay • Magnetic resonance imaging • Antituberculous treatment*

1. Introduction

Tuberculous spondylitis is more common and life threatening in patients with end-stage renal disease (ESRD) than in subjects with normal renal function [1]. It frequently poses both diagnostic and therapeutic challenges [2-4]. Currently destructive spondyloarthropathy (DSA) is reported in 8% to 18% of the dialyzed patients [5]. A differentiation between the two conditions is hard to make based only on clinical and roentgenological findings without a percutaneous needle biopsy.

We describe two cases of tuberculous spondylitis in patients with ESRD undergoing chronic hemodialysis therapy. They are IFN-γ assay diagnosed (QuantiFERON-TB Gold) and conservatively treated.

2. Case Presentation

Case 1: A 63-year-old diabetic man with chronic renal failure and an 8-year history of hemodialysis was evaluated for progressive thoracic back pain for a total of 4 months. He had no history of pulmonary tuberculosis, trauma or any other known precipitating factors. He was vaccinated with Bacillus Calmette-Guérin vaccine at the age of 17. Blood cultures and differential blood count were normal and the patient was afebrile. Sedimentation rate was 40 mm/h. There was a high level of Beta-2-Microglobulin in serum – 4.2 mg/L. Tuberculin skin test (TST) with 0.1 ml (5 TU) of tuberculin-purified protein derivative was negative. A sagittal T1, T2-weighted and TIRM magnetic resonance (MR) images of the thoracic spine (Figure 1) showed the involvement of the 3th and 4th thoracic vertebra in the infectious process with destruction of intervertebral disk and prevertebral abscess. These findings were consistent with tuberculous spondylitis, which was confirmed by

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Figure 1. Case 1: A sagittal T1, T2-weighted and TIRM magnetic resonance images at the beginning of the antituberculous treatment.

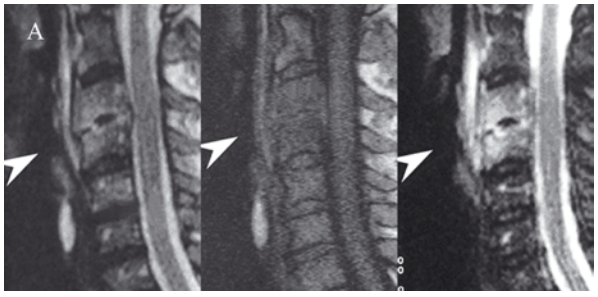


Figure 2. Case 1: A sagittal T1, T2-weighted and TIRM magnetic resonance images in the 9th month of the antituberculous treatment.

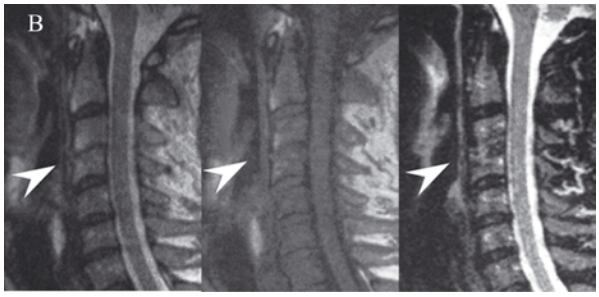


Figure 3. Case 2: A sagittal T1, T2-weighted and TIRM magnetic resonance images at the beginning of antituberculous treatment.

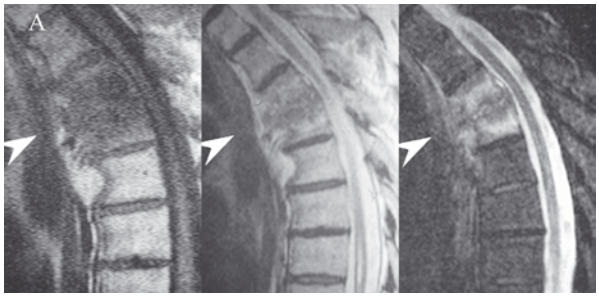
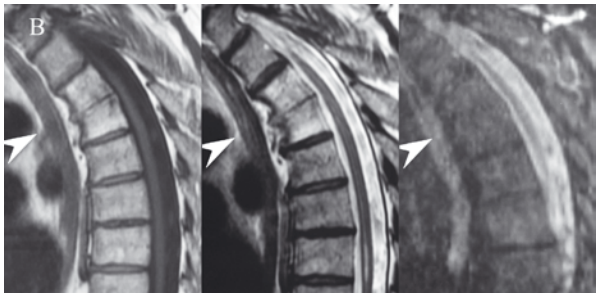


Figure 4. Case 2: A sagittal T1, T2-weighted and TIRM magnetic resonance images in the 9th month of the antituberculous treatment.



QuantiFERON - TB Gold test. Specific antituberculous therapy (rifampin - 600 mg/day, isoniazid - 200 mg/day and ethambutol 750 mg/day for the first three months, rifampin plus isoniazid for the second three months, and rifampin for the last three months) was started. The results achieved without any surgical intervention were remarkable. Magnetic Resonance images during the 9th month of the supervised antituberculous treatment (Figure 2) proved full resorbtion of the prevertebral collection and the presence of vertebral deformities.

Case 2: A 52-year-old afebrile man with a history of end-stage renal disease (resulting from interstitial nephritis) who had undergone hemodialysis for 6 years complained of progressive neck pain of 2 months duration. He was vaccinated with Bacillus Calmette-Guérin vaccine in his childhood. The patient had no prior history of pulmonary tuberculosis. The results of blood cultures, sedimentation rate tests, differential blood count, and conventional radiographs of the cervical spine were normal, indicating that infection was not a likely cause for the condition. There was no laboratory evidence of hyperparathyroidism, although there were periarticular and intraarticular calcifications in the hands and wrist of the patient, as well as a marked erosive arthropathy of the interphalangeal joints of the hands. Beta-2-Microglobulin in serum was 3.8 mg/L. Tuberculin skin test was negative. Destructive spondyloarthropathy was considered and the patient was instructed to wear a soft cervical collar. Repeat radiographs obtained 3 weeks later demonstrated marked obliteration of the intervertebral disk space between C3 and C4 and destruction of the adjacent end plate of C4. Findings from cervical magnetic resonance imaging (high signal intensity on T2-weighted and TIRM images) were diagnostic of spondylodiscitis and distinguishable from destructive spondyloarthropathy (Figure 2). QuantiFERON - TB Gold test was positive.

A treatment with rifampin - 600 mg/day, isoniazid - 200 mg/day and ethambutol 750 mg/day was conducted for two months; followed by rifampin plus isoniazid for four months, and only rifampin for three months. At the end of the treatment there were no complaints. MR images at the 9th month of the treatment (Figure 2) did not reveal any signs of signal amplification; no para-, pre- and epidural collections nor process activity were seen.

3. Discussion

Patients with chronic renal failure, who receive hemodialysis are an example of a population that typically manifests cutaneous anergy to skin test antigens [3,6,7]. Haemodialysis patients are at a 6 to 16 times higher risk of developing TB disease than others primarily due to the impaired cellular immunity that occurs in chronic

renal failure [8]. Tuberculous spondylitis is the most frequent form of extra-pulmonary TB [9]. Its diagnosis is difficult and requires a percutaneous needle biopsy.

Destructive spondyloarthropathy in patients with end-stage renal disease undergoing chronic hemodialysis therapy may mimics spondylodiscitis. Radiographic features simulate those of an infectious process, encompassing a range of abnormalities from superficial erosions to large bony defects [10]. The high signal intensity on T2-weighted images generally helps to eliminate the diagnosis of DSA in these patients.

The latest generation of IFN-γ assays such as the T-SPOT. TB (Oxford Immunotec, Oxford, UK) and QuantiFERON TB-Gold tests (Cellestis, Melbourne, Australia) have shown considerable promise in diagnosing TB in immunocompetent individuals, largely through improved specificity when compared with the TST [3] and are less affected by bacillus Calmette-Guerin (BCG) vaccination [11]. However, published data assessing the utility of these tests in immunocompromised populations remains limited. Given that IFN-γ – based assays also require intact cellular immune function, it has been suggested that immunologic anergy also may be their disadvantage as it is for the TST [3,7,12]. Furthermore, high IFN-γ production in response to M. tuberculosis-specific antigens indicates previous sensitization, although not necessarily in active disease. In this aspect, the IFN-γ analysis derived from an immunological test is not easy to distinguish latent infection from active disease [13]. Our 2 cases suggest that IFN-γ assays equip clinicians with more accurate tools for tuberculosis control as well as that a combination of T-SPOT. TB testing and MRI assessment may be the accurate method to diagnose tuberculous spondylitis in patients with end-stage renal disease.

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