The course of spinal tuberculosis (Pott disease): results of the multinational, multicentre Backbone-2 study

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Abstract

We aimed to describe clinical, laboratory, diagnostic and therapeutic features of spinal tuberculosis (ST), also known as Pott disease. A total of 314 patients with ST from 35 centres in Turkey, Egypt, Albania and Greece were included. Median duration from initial symptoms to the time of diagnosis was 78 days. The most common complications presented before diagnosis were abscesses (69%), neurologic deficits (40%), spinal instability (21%) and spinal deformity (16%). Lumbar (56%), thoracic (49%) and thoracolumbar (13%) vertebrae were the most commonly involved sites of infection. Although 51% of the patients had multiple levels of vertebral involvement, 8% had noncontiguous involvement of multiple vertebral bodies. The causative agent was identified in 41% of cases. Histopathologic examination was performed in 200 patients (64%), and 74% were consistent with tuberculosis. Medical treatment alone was implemented in 103 patients (33%), while 211 patients (67%) underwent diagnostic and/or therapeutic surgical intervention. Ten percent of the patients required more than one

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surgical intervention. Mortality occurred in 7 patients (2%), and 77 (25%) developed sequelae. The distribution of the posttreatment sequelae were as follows: 11% kyphosis, 6% Gibbus deformity, 5% scoliosis, 5% paraparesis, 5% paraplegia and 4% loss of sensation. Older age, presence of neurologic deficit and spinal deformity were predictors of unfavourable outcome. ST results in significant morbidity as a result of its insidious course and delayed diagnosis because of diagnostic and therapeutic challenges. ST should be considered in the differential diagnosis of patients with vertebral osteomyelitis, especially in tuberculosis-endemic regions. Early establishment of definitive aetiologic diagnosis and appropriate treatment are of paramount importance to prevent development of sequelae.

Keywords: Pott disease, spinal tuberculosis, spondylitis, spondylodiscitis, vertebral osteomyelitis
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Introduction

Tuberculosis (TB) is a global health problem infecting one-third of the world's population. It is a widespread disease, with 8.7 million new cases annually, and worldwide rates of TB have increased in parallel with AIDS incidence [1]. In addition, TB ranks second, just after HIV infection, among infectious causes of mortality. Turkey has been reported to be a low-incidence country for TB [2,3]. When extrapulmonary TB is taken into consideration, 10–35% of the cases refer to spinal tuberculosis (ST), also known as Pott disease [4,5].

Spondylodiscitis (SD) or vertebral osteomyelitis (VOM) usually involves the inflammation or infection of the intervertebral disc and the adjacent vertebrae. This disease is most commonly seen in patients older than 50 years, with a male predominance; it leads to significant morbidity [6–9]. The aetiologic agents of VOM may be bacteria, fungi or parasites, and their incidence varies in different geographical areas and with underlying diseases [7,10]. When the infecting agent is *Mycobacterium tuberculosis* complex, it is called ST [1]. In previous reports, delayed diagnosis and management are the major factors determining unfavourable outcomes such as spinal cord compression and deformities [7,11]. It may result in vertebral collapse and severe destruction, along with skeletal deformities and functional disability. In addition, compression of the spinal cord and/or nerve roots may result in neurologic deficits. Involvement of paravertebral soft tissues is a common feature of ST.

We sought to describe clinical, laboratory, diagnostic and therapeutic features, and clinical outcomes of ST in a large series of patients.

Materials and methods

Study design and data collection

The Backbone studies are two consecutive retrospective multinational/multicentre surveys. The Backbone-1 study compared brucellar and tuberculous SD patients, and its results will be published elsewhere. The Backbone-2 study, our focus here, included 314 patients with ST diagnosed and treated in 35 different centres between January 2000 and September 2013. The study period was the same in all of the centres involved in the study. Data of the patients were retrieved from hospital records and entered into a computer-based database designed for this study. The patients were followed for at least 6 months after termination of therapy. This study was approved ethically by the institutional review board of Dr Lutfi Kirdar Education and Research Hospital.

Inclusion criteria were as follows: patients with clinical and radiologic evidence of inflammation of one or more vertebrae and/or discitis plus microbiologic evidence and/or histopathologic evidence (caseating granulomas) of TB on bone, with or without paravertebral soft tissue specimen with or without other specimen rather than SD, and/or clinical and radiologic response to anti-TB therapy.

Microbiologic evidence included at least one of the following: isolation of *M. tuberculosis* in blood, bone, bone marrow, deep soft tissues and/or (paravertebral, epidural or psoas) abscess specimens; positive microscopy for acid-fast bacilli from bone, bone marrow, deep soft tissue and/or (paravertebral, epidural or psoas) abscess or any sterile body tissue (Ziehl–Neelsen