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Spontaneous methicillin-sensitive *Staphylococcus aureus* spondylodiscitis—Short course antibiotic therapy may be adequate: Evidence from a single centre cohort

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Abstract Spontaneous methicillin-sensitive *Staphylococcus aureus* spondylodiscitis is increasing in prevalence and there appears to be little consensus on the optimum management of this condition. This paper analyses antimicrobial therapy and associated outcomes over a seven-year period at a large UK hospital trust. A retrospective search strategy identified 55 patients; notes were available for 39. Patients were treated with a median 12 weeks of antibiotics (IQR 7), with 6 weeks intravenous (IQR 3) and 9 weeks oral therapy (IQR 6). 23 different treatment regimens were utilised. 33/36 (92%) patients for whom outcomes were available were cured or improved at latest follow-up. This study reports a wide variation in antibiotic prescribing at a single centre. Outcomes were generally positive regardless of total duration of therapy and proportion of intravenous therapy. These findings highlight the need for multi-centre prospective randomised controlled trials to determine the most clinically effective and low-risk treatment strategy.

Introduction

Spontaneous infectious spondylodiscitis is defined as an infection of the intervertebral disc space

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not resulting from iatrogenic causes. It is reportedly increasing in incidence [1,2] (estimated at 0.4—2.4 per 100,000 per year) and this is attributed to an ageing population, increasing prevalence of immunodeficiency [3] and improved radiological techniques [4]. Other risk factors include diabetes mellitus, malignancy, alcohol dependence syndrome, liver cirrhosis and intravenous drug use [3]. Multiple pathogens have been implicated but *Staphylococcus aureus* is the commonest isolate in most series, accounting for between 15 and 84% of cases [1,2,5]. Initial presentation is usually non-specific with back pain, fever or anorexia and neurological manifestations occur late. Accordingly, diagnosis is often delayed [1] and this increases the risk of complications such as spinal instability and neurological deficit [5]. Mortality is reported to be between 2 and 11% but if antibiotics are given in a timely fashion, the majority of patients respond favourably and avoid long-term neurological complications [5—7].

Although there have been a number of retrospective reviews of the management of adult spontaneous spondylodiscitis, there are currently no published prospective randomised controlled trials [6,8—16]. Recommendations on antimicrobial therapy for spondylodiscitis have been published in France and the UK [11,17,18]. However there appears to be little consensus on antimicrobial choice or duration in practice, either within or between institutions, although a minimum of 12 weeks therapy (often with six weeks via the intravenous route followed by an oral agent) is commonly quoted [2,5,6,11]. Furthermore, there is limited research focussing on infection with methicillin-sensitive *S. aureus* (MSSA) even though this is a common aetiological agent. There is a clear need to define the optimal management of this condition in order to reduce the morbidity and mortality associated both with under-treatment and with unnecessary prolongation of antimicrobial therapy. Accordingly, this study aimed to assess the management of MSSA spontaneous spondylodiscitis at a UK teaching hospital trust over a seven-year period, exploring in particular what lessons could be learnt from local antimicrobial prescribing patterns and their associated outcomes.

Materials and methods

The Sheffield Teaching Hospitals NHS Foundation Trust is one of the largest hospital trusts in the United Kingdom and has regional departments in infectious diseases, orthopaedics and neurosurgery. Adult patients with MSSA spondylodiscitis treated between 2005 and 2012 were identified through the hospital coding system and infectious diseases and microbiology databases. This highlighted 187 possible cases and eligibility for inclusion was further assessed using the following criteria:

1. Spontaneous spondylodiscitis (defined as non-iatrogenic) diagnosed on clinical grounds and radiological investigation (magnetic resonance imaging or computed tomography).
2. MSSA infection identified on culture of blood or disc biopsy or both.

The medical notes of these patients were reviewed, together with the results of their investigations through the trust's computerised investigation reporting system.

Risk factors for spondylodiscitis were defined as diabetes mellitus, age greater than 60 years, immunosuppression (including current use of relevant medication and other disease such as HIV), active malignancy, alcohol dependence syndrome (defined as frequent consumption of alcohol in excess of guidelines with documented evidence of tolerance or withdrawal), current intravenous drug use and liver cirrhosis (diagnosed on liver biopsy) [18]. When recording antimicrobial therapy data, only antibiotic regimes administered for more than five days continuously were included. Laboratory results (white cell count (WCC), C-reactive protein and erythrocyte sedimentation rate (ESR)) were recorded at diagnosis and at final follow up. Outcomes were defined as follows: cured — no further spondylodiscitis symptoms and no residual problems; relapsed — symptoms improved but further episode at a later date; improved — spondylodiscitis symptoms improved but some residual problems; death — due to spondylodiscitis or other cause; and unknown — lost to follow up.

The project was approved by the local clinical effectiveness department. Ethical approval was not required.

Results

Patient demographics and infection characteristics

We identified 55 cases that met the inclusion criteria, however, medical records were available for 39 patients due to a local policy of destroying older records or archiving them in off-site storage. Of this cohort 27/39 (69%) were male and the median age at diagnosis was 65 years (interquartile range