Aspergillus terreus: An unusual case of native vertebral osteomyelitis

Background

*Aspergillus terreus* is a ubiquitous mould increasingly recognised as a cause of invasive fungal infections. Native vertebral osteomyelitis (NVO) and discitis secondary to aspergillus species is rare and typically seen in immunocompromised patients. Here we present a case of *Aspergillus terreus* NVO.

Case presentation

A 66 year old female patient with a history of type II diabetes presented with a 1 month history of back pain with no neurologic deficit. On admission she was febrile and had an elevated C-reactive protein (102 mg/L). Three weeks prior to her admission she had returned from a two month trip to India and Pakistan, during which she had had a fall. However, she did not sustain significant trauma or injury. She denied any history of night sweats, cough or any TB contacts.

MRI imaging revealed T8-9 vertebral osteomyelitis. Multiple blood cultures were sent and were negative. On Day 14 of her admission she underwent a CT-guided biopsy and samples were sent for bacterial and mycobacterial culture. Biopsy culture yielded no growth and a 16S PCR was negative. She was empirically treated with teicoplanin and ciprofloxacin. Due to worsening back pain a repeat MRI was performed on day 20, this showed disease progression. She developed leukopenia secondary to teicoplanin and so antibiotics were stopped on day 23. Three days later she had a mildly elevated β-D-glucan (95 pg/ml) and a positive ImmunoCAP Aspergillus IgG (99.8 mg/L). On day 31 of admission, she underwent a second spinal biopsy and samples were sent for bacterial, mycobacterial and fungal culture. Empirical daptoycin and ciprofloxacin were commenced following the biopsy. Fungal cultures yielded *Aspergillus terreus* and the patient was commenced on voriconazole. Clinical review and investigations did not find any evidence of pulmonary aspergillosis. Susceptibility results showed that the *A. terreus* was sensitive to voriconazole, posaconazole, itraconazole, isavuconazole and caspofungin.

Surgical treatment

On day 67, the patient developed new leg weakness and repeat MRI showed deterioration with cord compression secondary to the disc collection at T8/T9. She proceeded to have emergency thoracic decompression which was followed by radical debridement 10 days later. Intra-operative samples did not yield any further growth of *A. terreus*.

Antifungal treatment

Antifungal treatment was initiated with voriconazole on day 37 of admission. Shortly after starting treatment the patient developed a severe hypersensitivity reaction to voriconazole with skin rash and drug induced liver injury. This was associated with a concurrent high pre-dose voriconazole level of 5.6 mg/L. She was briefly treated with Ambisome before switching to caspofungin on day 47. Posaconazole was added to the caspofungin on day 70. The patient made good progress and was discharged on day 102 with Posaconazole monotherapy and completed a total of 6 months antifungal treatment. Her symptoms, CRP and aspergillus antigen titres improved over her treatment course (Figures 3 and 4).

Discussion

Aspergillus species are uncommon aetiological agents of NVO especially in patients who are immunocompetent. A recent systematic review found that the majority of cases of fungal osteomyelitis are caused by *A. fumigatus*, with *A. terreus* only being responsible for 3.6% of cases. Our patient had type 2 diabetes but no other immunocompromise. Her primary presenting complaint was back pain which is the commonest clinical feature in aspergillus spinal infection. The Infectious diseases society of America (IDSA) guidelines for the treatment invasive aspergillosis recommend voriconazole or amphotericin B as first line treatment for *Aspergillus* osteomyelitis. *A. terreus* is considered to be inherently resistant to amphotericin B. Despite this, the majority of case reports of *A. terreus* spondylodiscitis have reported on the use of Ambisome either alone or as part of combination therapy with some success. Voriconazole was chosen as initial therapy but the patient had a significant hypersensitivity reaction to this agent. This case highlights that fungal aetiology should be considered irrespective of immune status in patients who fail to respond to initial management, particularly if they have a history of diabetes. It illustrates the importance of pursuing a microbiological diagnosis. In this case a second spinal biopsy was required to obtain positive culture results. We have also demonstrated that a combination of caspofungin and posaconazole can be used to treat *A. terreus* NVO where voriconazole is not tolerated. Combined surgical and prolonged anti-fungal therapy as in this case, is often required for successful treatment of aspergillus NVO.

References: