CASE REPORT

Anything rare is possible here: Brucellosis in London in 2012

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SUMMARY

Brucellosis is a rare zoonotic disease in the UK but endemic in parts of the world, including the Mediterranean region, South and Central America, Caribbean, Africa and Persian Gulf. Therefore, the most common routes of transmission to the UK are either through emigration or by vacationing in such endemic regions. This provides us the challenge even today, especially in the extensive multi-ethnic area of East London, in recognising the signs and symptoms of the rare disease of Brucellosis. Here, we report such a patient case of Brucellosis.

BACKGROUND

Across the world, Brucellosis is known by many names such as Bang's disease, Mediterranean fever, Gibraltar fever, Crimean fever, Maltese fever, Malta fever, Rock fever or undulant fever.¹ In the endemic regions, the main route of transmission is either contact with infected animals or consumption of unpasteurised animal products (eg, milk) including imported unpasteurised products.¹ Therefore, such transmission in the UK is mainly through holiday makers and immigrants. It is important to remember and recognise the signs and symptoms of Brucellosis, which includes a sudden acute onset of fever, sweats, weight loss and bone pain. The latter commonly involves the spinal cord, with the most affected area reported being the lumbar vertebrae, followed by thoracic and then cervical vertebrae.² In our case, the patient suffered from osteoarthritis, which led to the assumption for the cause of our patient's back pain initially. For this patient, the key investigations were essential for diagnosing Brucellosis in time, to prevent permanent neurological complications.³

CASE PRESENTATION

A 49-year-old Somali man with a 4-week history of lower back pain and weight loss presented with haematuria, rigours, fever and recent night sweats. He was feverish, tachypnoeic, tachycardic and hypotensive on arrival in A&E department. He had osteoarthritis but an otherwise unremarkable medical history with no previous infection or malignancies. Blood tests and blood cultures were carried out, which revealed initially growth of unidentified Gram-negative rods. Chest x-ray revealed a right apical shadowing, which was confirmed not to be tuberculosis with sputum culture. He was discharged with the started course of Augmentin, after bronchoscopy investigations were confirmed to be normal.

A week later blood culture results revealed the infective organism, for which the patient was started on rifampicin and doxycycline. He was referred back as an inpatient for MRI spine, which confirmed Brucellosis.

INVESTIGATIONS

On initial admission, haemoglobin was 10.6 g/dl, white blood cell count was 8.6 g/dl and serum electrolytes were normal. However, creatine was 181 g/dl, urea was 97 g/dl, amylase was 315 g/dl and C reactive protein was 93.8 g/dl. Also, urine dipstick revealed the presence of blood and protein. On examination, the patient indicated pain in the lower thoracic region, especially on palpation. There were crepitations and reduced air-entry in the right middle zone. However, the chest x-ray only significantly showed a right apical shadowing. With the sputum culture being normal, the patient was scheduled for a bronchoscopy. There were no abnormalities detected on bronchoscopy and on bronchial lavage either. Only the blood cultures confirmed infection with unidentified Gram-negative rods.

There was extensive work by microbiologists in the identification of Brucellosis on blood cultures. The patient was referred back as an inpatient for MRI spine. The MRI results revealed marked abnormality centred upon T7–10 vertebral bodies with slight intracanalicular extension with impression on anterior subarachnoid space however without cord compression, along with paravertebral collection (figures 1–3). His neurological examination was remarkable. A spinal biopsy was requested for further confirmation.

DIFFERENTIAL DIAGNOSIS

Brucellosis affects several organs, especially the spinal cord. In such latter cases, the other associated symptoms reported include weakness (69%), fever (66%), weight loss (57%), sweats (54%), arthralgia (54%) and neurological deficits (46%).³ Therefore, in endemic regions, Brucellosis is one of the top differential diagnoses for sudden onset of back pain.

Brucellosis is a non-caseating granulomatous disease, similar to tuberculosis. Both show some similar clinical presentation. East London is specifically an endemic region for tuberculosis, and the case for Brucellosis is rare. It has been suggested by Turgut *et al*⁴ that the criteria for which two is required to confirm the diagnosis of Brucellosis (figure 4).

To cite: Javaid MR, Farrugia M, Noeman Ahmed Y. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-009178

Figure 1 Sagittal MRI T1W of the thoracic spine showing altered marrow signal (oedema) in the vertebral bodies of T7–T10.

TREATMENT

The patient started the course of rifampicin and doxycycline before being admitted as inpatient. However, his symptoms did not improve a week later, so he was started on a higher dose of rifampicin (450 mg) and doxycycline (250 mg), along with added gentamicin (250 mg). Two weeks later in hospital, he was scheduled for another MRI that showed partial improvement to treatment. The option of surgery was discussed; however, for the best interest of the patient it was agreed that he should be treated pharmacologically.

OUTCOME AND FOLLOW-UP

Brucellosis was notified and the patient was referred to the Hospital of Tropical Diseases. He was discharged with clinical improvement after 3 weeks, and is to continue on the same course of rifampicin and doxycycline for 6 months.

Figure 2 Sagittal MRI T1W post-Gd contrast of the thoracic spine showing abnormal enhancement in the vertebral bodies of T7, T8, T9 and T10. Enhancement of the posterior longitudinal ligament is also visible.

Figure 3 Sagittal CT MPR reconstruction (bone setting) of the thoracic spine showing lytic lesions in the vertebral bodies of T8, T9 and T10.

The patient was followed up regularly and a repeat MRI spine was requested after 3 months. This MRI spine showed a further amelioration of the infection in the affected thoracic vertebrae, along with reduction in paravertebral collection. Also, it showed almost a complete resolution of the intracanalicular extension with no impression observed. With such improvement, the patient will be continued on the same treatment and will be followed up regularly.

DISCUSSION

Our patient emigrated to the UK last year prior to his first clinical presentation of Brucellosis at A&E department. He had spent his whole life in East Africa working as a driver in trading. Interestingly, Brucellosis is reported to be an occupational disease especially in the UK, only for workers in microbiology laboratories¹; as UK officially declared Brucellosis free since 1991.¹ However, across the world, it still infects occupations including shepherds, abattoir workers, veterinarians and dairy industry professionals. In our case, the patient may have been infected by ingestion of unpasteurised milk or dairy products. The last other route of transmission is via inhalation of infected aerosolised particles.

There are six main species of *Brucella* (*Brucella melitensis*, *Brucella suis*, *Brucella canis*, *Brucella abortus*, *Brucella ovis* and *Brucella neotomae*), which are all small Gram-negative, intracellular coccobacilli. These are diagnosed by performing blood cultures, tissue biopsy (eg, spinal biopsy) or serological assays. In our case, it took over a week to identify the Gram-negative rod organism from the blood cultures, due

• Classical Clinical Presentation of Brucellosis
• Positive Serology Results
• Radiological findings consistent with Brucellosis
• Histological findings of chronic inflammation and non-caseating granulomatous tissue.

Figure 4 A suggested criteria for diagnosing Brucellosis suggested by Turgut *et al*⁴.

to the rare assumption of Brucellosis. Blood cultures have been reported to have high specificity but low sensitivity for chronic form of Brucellosis.⁵ These days, in endemic regions, they use a serological assay called Wright reaction with high sensitivity and specificity, even with low titres.⁵ If their Wright reaction result comes negative, they are required in high suspected cases to then carry out a Coombs test.⁵ We should consider having a Wright reaction assay, especially to help us in rare situations, where there is extensive search for identifying Gram-negative rods.⁶ However, there are more advanced, quick but expensive techniques available, including ELISA and PCR, which could be considered. Imaging is also essential to confirm, with the best option being MRI. With spinal cord involvement, MRI spine will indicate affected the vertebral region or multiple regions and other abnormalities like abscess or oedema.

From all this experience, Brucellosis will still need to be a differential diagnosis, for similar clinical presentation and in point of investigations, especially in East London even today.

Learning points

- Brucellosis is rare in the UK today; however, it still needs to be a differential diagnosis in patients who have been abroad in endemic countries.
- The clinical presentation of Brucellosis may be similar to Tuberculosis. However, there are distinct clinical differences and extensive investigations available for diagnosis.
- Permanent neurological complications can arise if there is any difficulty in diagnosing and delay in treating Brucellosis.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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