Pleural fluid characteristics in pulmonary brucellosis

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Abstract

Although pulmonary symptoms accompany up to 16% of cases of infection with *Brucella melitensis*, pleural effusion has rarely been reported. A 12 year old girl had brucellosis with pulmonary disease and a pleural effusion. The pleural fluid was clear and straw coloured with 2700 leucocytes/mm³ (93% lymphocytes), a protein level of 48 g/l, and a glucose concentration of 4.1 mmol/l. Culture of the pleural fluid grew *Br melitensis*.

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Brucellosis, a zoonotic infection with micro-organisms belonging to the genus *Brucella*, is a world wide public health problem. The disease affects various parts of the body including the reticuloendothelial, haematological, musculoskeletal, and central nervous systems. The clinical manifestations of brucellosis are variable, with infrequent pulmonary involvement.¹⁻³ Pleural effusion is one of the pulmonary complications in brucellosis. However, to our knowledge there is no description of the content of the pleural fluid.

Case report

A 12 year old girl was admitted to hospital because of fever, dry cough, and pleuritic pain of two weeks duration. In addition she had suffered from low back pain, weight loss and night sweats for two months before her admission. She lived in an Arab village where consumption of goat milk products is common. Six months earlier she had been treated for two weeks with tetracycline and rifampicin because of positive *Brucella melitensis* titres of 1:640. Physical examination on admission revealed an afebrile, ill looking child, with a respiratory rate of 25/min and a heart rate of 100/min. Chest examination revealed dullness on percussion of the right base with reduced fremitus and reduced air entry to the same area. No crackles were heard. There was hyperlordosis of the spine with sensitivity of the thoracolumbar vertebrae, maximal over T4-5. Other physical findings were normal.

Laboratory findings included blood leucocytes of 6800/mm³ with a differential count of 29% neutrophils, 64% lymphocytes, 4% monocytes, and 3% eosinophils. The ESR was 45 mm in one hour. Serum electrolyte levels, and liver and renal function tests were normal. Chest radiography showed an area of consolidation in the right lower lobe with a right

pleural effusion (figure). Ultrasonographic examination of the chest demonstrated a large pleural effusion with septations and loculations. Spinal radiographs and a computed tomographic scan of the thorax showed compression and destruction of T12 vertebra and the bone scan showed a similar focus of increased uptake in T12. The Mantoux test was negative. A diagnostic pleural tap revealed clear and straw coloured fluid, with 2700 leucocytes/mm³ (93% lymphocytes), a protein level of 48 g/l, and a glucose concentration of 4.1 mmol/l. No bacteria (including mycobacteria) were identified by special stains. Culture of the pleural fluid grew *Br melitensis*. Serum agglutinating antibodies for *Br melitensis* were positive with a titre of 1:5120. Blood culture grew *Br melitensis*.

Treatment was started with a six week course of oral tetracycline (30 mg/kg/day) and intramuscular streptomycin (25 mg/kg/day). The streptomycin was changed to rifampicin after five days when an audiogram revealed hearing loss in the left ear. Her clinical condition improved rapidly after initiation of treatment and she was discharged two weeks later. The child received two additional courses each of four weeks of antibiotics comprising rifampin and trimethoprim-sulphamethoxazole. The pleural effusion and infiltrate cleared gradually. Six months later chest radiographs were normal, there were only slight changes in the vertebra, and *Br melitensis* serological tests were negative.

Discussion

Brucellosis is a disease with protean manifestations that can occur at any age and can affect various organs. Although inhalation is one of the routes of acquiring brucellosis,^{4,5} pulmonary disease is considered to be uncommon.¹⁻³ Several pulmonary manifestations have been reported including bronchitis, bronchopneumonia, lung abscess, pleural effusion, pulmonary nodules, and hilar lymphadenopathy.^{3,6-9} In a prospective study of 400 adults from Kuwait¹ respiratory symptoms including cough and dyspnoea with a normal chest radiograph were present in 16% of cases. Respiratory complications, however, were reported in only four patients (1%), three with pneumonitis and one with a pleural effusion. In children pulmonary involvement seems to be even more unusual, with only four out of 1300 children with brucellosis reported from Kuwait having pulmonary disease.^{3,10} Lubani *et al*³ analysed 1500 patients with brucellosis (children and adults) and found nine cases with pulmonary involvement. In their report three patients had a pleural effusion, and in two of them *Br melitensis* was isolated from the pleural fluid. However, no details of the type of pleural fluid was given. The growth of *Br melitensis* from the pleural space implies that the pleural effusion is due to direct invasion by the bacteria into the pleural space. In addition, the type of effusion in our patient – exudate with predominance of lymphocytes – suggests that *Br melitensis* triggered a local pulmonary lymphocytic

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Area of consolidation in the right lower lobe and pleural effusion.

reaction. This was associated with a loculated effusion as seen with ultrasonography, indicating an organising process. We speculate that the absence of polymorphonuclear cells in the

pleural space was associated with the favourable response to conservative treatment.

Although *Br abortus* is less virulent than *Br melitensis* and generally causes a milder disease, systemic and localised manifestations have been reported. To our knowledge pulmonary disease caused by *Br abortus* has been reported only once,⁶ and in that report the patient had diffuse interstitial fibrosis and hilar lymphadenopathy.

We conclude that *Br melitensis* should be added to the long list of microorganisms causing an exudative lymphocyte predominant pleural effusion. Although direct infection of the pleura occurs, conservative treatment with antibiotics may be sufficient.

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Response to ketamine in status asthmaticus resistant to maximal medical treatment

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Abstract

The case is reported of a 28 year old woman with status asthmaticus unresponsive to three days of maximal medical treatment. Resolution of bronchospasm was achieved with an infusion of the intravenous anaesthetic agent ketamine.

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Ketamine is a unique intravenous anaesthetic agent with sedative, analgesic, and bronchodilator properties. Its propensity to cause distressing emergence phenomena has limited its

use. It has been used successfully in patients with acute asthma¹⁻⁴ but these patients had not received maximal medical treatment as judged by current standards. The treatment of acute asthma is outside the terms of its UK product licence and its role in this setting remains to be defined. This report describes its successful use in a patient in whom conventional medical treatment had failed.

Case report

A 28 year old woman with a history of asthma was admitted unconscious having suffered a respiratory arrest at home. Endotracheal intubation was performed immediately, arterial blood gases following intubation were pH 6.93, PaCO₂ 14.1 kPa, PaO₂ 14.0 kPa, (Fio₂ 1.0). Initial treatment was with intravenous hydrocortisone 200 mg, aminophylline 250 mg, and ventilation by hand with 1% halothane in oxygen. In the intensive care unit treatment was continued with intravenous aminophylline 0.9 mg/kg/hour, hydrocortisone 200 mg every six hours, and nebulised ipratropium bromide 500 µg four hourly. Mechanical ventilation