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Melioidosis with brain abscess

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Summary: Central nervous system involvement in melioidosis is rare. We describe a 48 year old woman who developed septicaemia and a brain abscess due to *Pseudomonas pseudomallei*. Since there is a continuing practical problem in bacteriological confirmation of the aetiological agent, diagnosis of melioidosis has to be made on clinical suspicion.

Introduction

Melioidosis, an infectious disease caused by *Pseudomonas pseudomallei*, is endemic in areas between 20° North and 20° South of the Equator, principally in South-East Asia.[1] The clinical manifestations of melioidosis range from a mild subacute disease with localized lesions to a fulminant septicaemic form.[2] Central nervous involvement is unusual. We report a case of acute melioidosis associated with a brain abscess occurring in a 48 year old woman.

Case report

A 48 year old Malay woman was admitted to hospital in July 1986 with a history of a swelling over the right parietal region of the scalp for one week, associated with headache, high fever, malaise and mental confusion. There was no history of head injury or convulsions.

On examination, the patient was febrile and emaciated, she was conscious but disorientated. There was a large soft non-tender fluctuant swelling over the right parietal region of the scalp measuring 10×15 cm. There was no papilloedema and no cranial nerve palsies. There was, however, marked neck stiffness. Skull X-ray showed irregular lytic lesions in the right parietal region (Figure 1). There was leucocytosis with neutrophilia. She was started on intravenous ampicillin, cloxacillin and chloramphenicol. A computed tomographic (CT) scan of the brain showed a large right parietal intracerebral abscess with typical ring enhancement and fluid collection under the scalp (Figure 2). Needle aspirations of both scalp and intracerebral abscesses were performed. A large amount of pus was evacuated. The skull was found to be eroded, bone fragments were biopsied and found to be osteomyelitic. *Pseudomonas* sp. was isolated from the cerebral and scalp abscesses, bone fragments and the blood cultures. Post-operatively the patient was on chloramphenicol and cefoperazone. She improved and became afebrile. A repeat CT scan showed persistence of the cerebral abscess. Thick

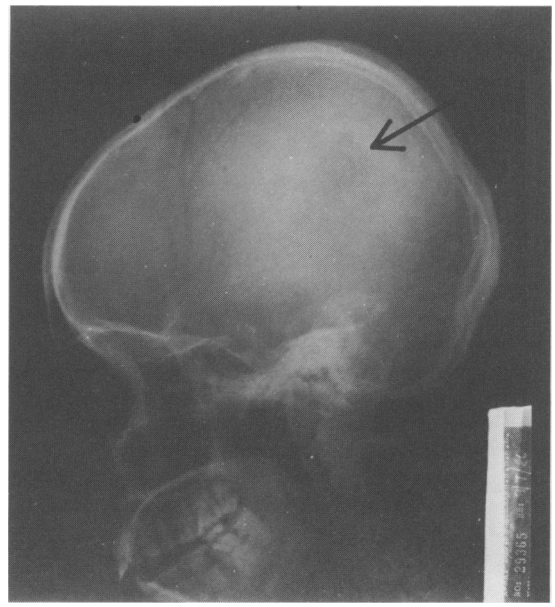

Figure 1 Skull X-ray showing irregular lytic lesions in right parietal region.

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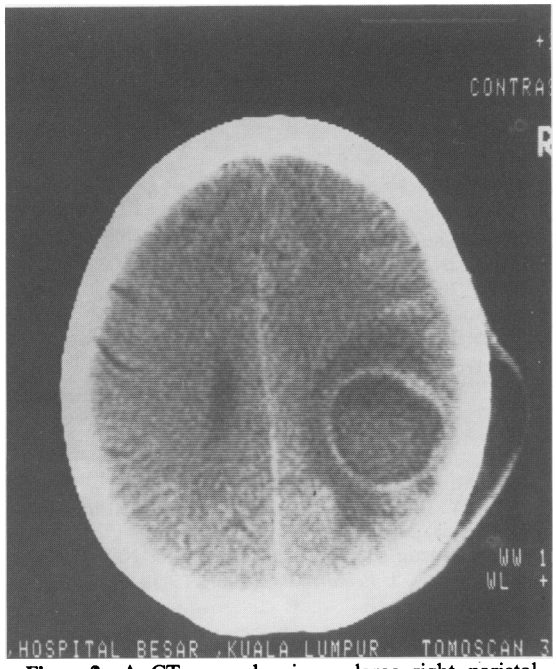

Figure 2 A CT scan showing a large right parietal intracerebral abscess with typical ring enhancement and fluid collection under the scalp.

pus was obtained in the second aspiration. Chloramphenicol was stopped and she was maintained on cefoperazone. Subsequently, she showed signs of left hemiparesis. A further scan showed that the abscess had reduced in size but there was increased cerebral swelling with shift of the ventricles. Intravenous mannitol and dexamethasone were given, the antibiotic was changed to ceftazidime. Once the *Pseudomonas* sp. was confirmed to be *Ps. pseudomallei*, intravenous chloramphenicol was again added. Despite these, her condition steadily worsened and she began to show signs of tentorial herniation. A generous craniectomy and re-aspiration of the abscess was done. Minimal pus was obtained and the brain was necrotic and oedematous. She continued to deteriorate, developed pneumonia and finally succumbed.

Discussion

Diagnosis of melioidosis requires a high index of suspicion. Unless the laboratory is forewarned, the causative agent, *Ps. pseudomallei*, can be easily misidentified.[3] Delay in bacteriological confirmation poses a problem in the management of melioidosis. *Pseudomonas* sp. isolated from the scalp and intracerebral abscesses were identified as *Ps. cepacia* whereas the isolate from the bone fragments was identified as *Ps. stutzeri* using the API 20 NE kit. Due to clinical suspicion, the tests were repeated and were then found to be *Ps. pseudomallei.* The second pus aspirate and the blood culture also grew the same organism. The strain was sensitive to chloramphenicol, the newer cephalosporins, including cefotaxime, cefoperazone and ceftazidime, but resistant to aminoglycosides, including amikacin, using the disc diffusion technique.

Ps. pseudomallei is found widely in soil and surface water of the rice fields in several parts of Malaysia.[4] The likely mode of transmission in the patient is by a percutaneous route through skin abrasions. Though pulmonary melioidosis is a commoner presentation, chest X-rays had remained clear throughout her hospitalization except at the terminal stage. Brain abscess secondary to skull osteomyelitis is usually a sequelae of head injury with ascending infections.[5] It is assumed that the skull osteomyelitis is a result of haematogenous infection and by means of contagious spread leads to intracranial and extracranial abscesses. In view of the extensive pus collection under the scalp and her debilitated condition, needle aspirations and drainage of the abscesses were performed combined with generous lavage of the abscess cavity with chloramphenicol solution. The second aspiration may have breached the abscess capsule, hence disseminating the organisms into the adjacent parenchyma.

Septicaemia uncommonly follows initial exposure or reactivation of infection. It is often associated with multi-organ abscess formation and carries a high mortality rate. Overall mortality rate for septicaemic melioidosis exceeds 50%, even with intensive antibiotic therapy.[6,7,8]

Tetracycline, chloramphenicol and cotrimoxazole have been the mainstays of treatment over the years. A recent study has shown that these antimicrobials are only bacteriostatic *in vitro*.[9] They are therefore not ideal for treating septicaemic melioidosis. The new beta-lactam antibiotic, ceftazidime, has been found to be effective in treating an immunocompromised patient with pulmonary melioidosis.[10] This patient was on cefoperazone and chloramphenicol; clinical deterioration appeared to coincide with cessation of chloramphenicol. Finally, chloramphenicol was again added and cefoperazone was substituted by ceftazidime. The efficacy of this antibiotic regimen is yet to be evaluated. However, treatment should be for a prolonged period although the optimal length of treatment has not been clearly defined.[6,11]

New quinolone derivatives, though active against *Ps. aeruginosa*, have not been shown to be useful against *Ps. pseudomallei*.[9]

Finally, the increasing reports of melioidosis should alert both clinicians and microbiologists to be aware of this clinical entity and make the diagnosis as soon as possible.

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