Tuberculous meningitis in the elderly

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Summary

Six cases of tuberculous meningitis, all occurring in patients over the age of 65, are described. All patients presented with an acute illness, primarily with a confusional state. Headache was a symptom in only two patients and the cases were not confined to ethnic minority groups. The mortality was 50%.

KEY WORDS: tuberculous meningitis, acute confusional state.

Introduction

Tuberculous meningitis is a disease usually of neonates, young children and young adults in whom it is generally regarded as a complication of the primary infection. In the elderly adult this infection is viewed not only as a reactivation of a dormant state but as an illness with a long prodrome. We report six cases of tuberculous meningitis occurring in elderly patients in which the presentation of the illness was acute and in whom evidence of old tuberculosis was not always present.

Case reports

Case 1

A 70-year-old Indian woman, resident in the U.K. for 3 years, was admitted with a 7-day history of anorexia and a 48-hr history of increasing confusion. She had vomited once on the day before admission. She had been well before this illness. The main clinical finding was disorientation. The patient was pyrexial 38°C, and there were small mobile lymph nodes in her right supraclavicular fossa. A chest X-ray was normal. A lumbar puncture showed clear cerebrospinal fluid (CSF). Analysis of CSF was white cell count (WCC) of 20×10^6 /litre (all lymphocytes); protein of 5.5 g/litre; sugar content 0.8 mmol/litre (blood sugar 5.7 mmol/litre). Acid-fast bacilli were not seen on microscopy, but *Mycobacterium tubercu-*

losis was subsequently cultured. Histology of lymph node biopsy showed epithelioid granulomata. Tuberculous meningitis was diagnosed on the CSF findings and the patient was treated with rifampicin, isoniazid and ethambutol. The patient subsequently developed a left hemiparesis though angiography showed ventricular dilatation only. Despite the addition of dexamethasone the patient died 6 weeks after admission.

Case 2

An 82-year-old Caucasian woman, previously fit and independent, was admitted with a 10-day history of lassitude, increasing drowsiness and incontinence. The only symptom otherwise of note was that of a longstanding cough. She was pyrexial, dehydrated, and was confused but there were no focal neurological findings. Chest X-ray showed old calcified foci. A lumbar puncture yielded straw-coloured fluid. WCC 81×10^6 /litre (60% lymphocytes); protein 6.9 g/litre and sugar 1.9 mmol/litre (blood sugar 6.1 mmol/litre). Microscopy revealed acid-fast bacilli in large numbers and these were subsequently characterized as *M. tuberculosis*. Microscopy of sputum also showed the presence of scanty numbers of acid-fast bacilli. The patient was treated with rifampicin, isoniazid and ethambutol. She subsequently developed the syndrome of inappropriate secretion of ADH, but despite successful treatment of this with water deprivation she remained incontinent of urine and showed intellectual and memory loss. Serial CT scans were compatible with the development of communicating hydrocephalus. A right ventriculocaval shunt was performed but there was no further improvement in the patient's condition and she died from bronchopneumonia 5 months after admission.

Case 3

A 68-year-old West Indian man presented with a

2-week history of confusion and incontinence. During this time the patient had developed polyuria and had lost 18 kg in weight. Glycosuria had been noted shortly before admission. Examination revealed him to be confused and dehydrated. Chest X-ray was normal. CSF was xanthochromic: WCC 22×10^6 /litre (all lymphocytes); protein was 1.2 g/litre and sugar content was 5.2 mmol/litre (blood sugar was 13.4 mmol/litre). No organisms were seen on microscopy but *M. tuberculosis* was isolated on culture. The patient was treated with rifampicin, isoniazid, ethambutol and streptomycin. There was a deterioration in the patient's mental state but a CT scan showed no evidence of hydrocephalus. The patient slowly improved and was discharged, personally independent, 7 weeks after admission.

Case 4

A 65-year-old Indian woman was admitted with a 1-week history of fever, anorexia, vomiting and worsening headache. She had been drowsy for 3 days and confused for 24 hr. Examination in addition revealed a left extensor plantar response. Chest X-ray showed a right upper paratracheal mass. CSF: WCC 550×10^6 /litre with 60% lymphocytes; protein 2 mg/litre; sugar 2.1 mmol/litre (blood sugar 5.8 mmol/litre). Microscopy showed no organisms. The patient was treated with streptomycin, rifampicin and isoniazid. Thirty-six hours after admission she developed focal epilepsy of her right arm. Subsequently she had bilateral cranial nerve VI palsies and was hyperreflexic on her left side. Three days after admission, investigations revealed that she had developed the syndrome of inappropriate secretion of ADH. As the differential diagnosis included a partially treated pyogenic meningitis, she was also treated with benzyl penicillin and sulphadimidine. Repeat CSF examination showed protein 1.7 g/litre, WCC of 378×10^6 /litre and sugar 1.4 mmol/litre. Microscopy again revealed no organisms. The patient died 6 days after admission from respiratory arrest. Post-mortem examination revealed there was obvious involvement of the para-aortic and tracheal nodes, spleen and liver with histology at all these sites showing caseation and epithelioid granulomata. Inspection of the brain showed a fibrinous exudate in the subarachnoid space and surrounding brain stem. CSF cultures later grew *M. tuberculosis*.

Case 5

A 66-year-old Caucasian man previously presented to another hospital with an inferior myocardial infarction which required a temporary cardiac pacemaker. Two days after this had been removed he developed a cough with purulent sputum and was treated with co-trimoxazole. One week later he

complained of persistent headache and 3 days subsequently a lumbar puncture was performed. CSF showed WCC 84×10^6 /litre with 80% lymphocytes; protein was 1.2 g/litre, and sugar content was 3 mmol/litre. Microscopy and culture were negative. He was thought to have a partially treated pyogenic meningitis and received parenteral benzyl penicillin and sulphadimidine. The headache persisted and a technetium brain scan showed increased uptake in the right occipital region. The patient was transferred to the regional neurosurgical department. His symptoms at that time were severe right frontal headache, nausea and vomiting. Examination revealed him to be pyrexial. He was conscious and orientated but with a mild left hemiparesis, and homonymous hemianopia. Emergency angiography of carotid and vertebral vessels showed occlusion of one of the terminal cortical branches of the right posterior cerebral artery with localized infarction. Chest X-ray showed bullae at the apices with a calcified mass at the left mid-zone. The patient continued to receive penicillin and sulphadimidine but over the next 9 days his condition deteriorated with increasing confusion and evening pyrexia. Repeat lumbar puncture yielded slightly turbid CSF: WCC 330×10^6 /litre, (90% lymphocytes); protein 4.0 g/litre; sugar 1.4 mmol/litre. Microscopy showed no organisms and culture was negative. On the basis of his CSF findings tuberculous meningitis was diagnosed and the patient was treated with rifampicin, isoniazid, streptomycin and dexamethasone. He eventually recovered.

Case 6

A 69-year-old Caucasian woman was admitted with a 2-day history of confusion. There was a history of loss of weight of 6 kg over the previous year. She had been in contact with a case of open pulmonary tuberculosis a few weeks before admission. Examination revealed a pyrexial, drowsy and confused woman. Chest X-ray was normal. CSF: WCC 173×10^6 /litre (all lymphocytes); protein 1.8 g/litre. Microscopy for organisms and culture were negative for acid-fast bacilli. The patient was treated as having tuberculous meningitis on the basis of the CSF findings with streptomycin, rifampicin, isoniazid and ethambutol. She continued to be confused for 2 weeks after admission. Three and a half weeks after she had come in she was discharged home personally independent.

Discussion

Tuberculous meningitis is rare: in a 4-year period it accounted for 10 out of 348 cases of meningitis occurring in those over the age of 65 (Newton and Wilczynski, 1979). The six cases reported now pre-

sented to this hospital over 6 years and demonstrate that the clinical features of this illness in the elderly differ from those generally described.

All of our patients presented with a short prodrome of no more than 2 weeks and in three it was 1 week or less. This contrasts with the findings of Kennedy and Fallon (1979) and Haas *et al.* (1977) in their surveys of patients of all ages, who found that the duration of the prodrome exceeded 2 weeks in two-thirds of their patients. Many of the classical features of tuberculous meningitis were absent in our cases. Although restlessness and irritability were universal, photophobia was not elicited in any patient; headache and vomiting were present in only two and fever in four. Significant weight loss had occurred in one patient. Further difficulties in diagnosis in this age group are that osteoarthritis of the cervical spine is the commonest cause of neck stiffness and that both Kernig's and Brudzinski's signs may be absent.

Evidence of previous tuberculous infection was found in four patients, but in only one patient did chest radiography suggest active disease—a paratracheal mass—whilst of the remainder two had calcified foci.

The characteristic CSF findings in tuberculous meningitis are those of a raised white cell count, predominantly lymphocytes; a raised protein and a reduced glucose content. Although the white cell count is usually of the order of $400 \times 10^6/\text{litre}$ (Kocen, 1977) it is interesting to note that only one patient had a level of this order and three patients had counts $<100 \times 10^6/\text{litre}$. It is important to recognize that normal CSF findings can occur in tuberculous meningitis and that repeated lumbar punctures may have to be performed before changes

compatible with the diagnosis are found (Kocen, 1977). Similarly negative culture for *Mycobacterium tuberculosis* in the presence of characteristic CSF findings does not exclude the diagnosis, as is shown by case reports 5 and 6, with their response to specific therapy.

Treatment should begin on clinical grounds as soon as possible. Factors affecting mortality are delay in commencing treatment, length of illness before admission and age greater than 50 years (Kennedy and Fallon, 1979), and our small series confirm these findings. Our experience suggests that any elderly patient with a fever and an acute confusional state that persists warrants a lumbar puncture, and that clues for signs of tuberculosis elsewhere—e.g. lymphadenopathy—should be taken seriously, particularly in patients from Asia. Although this hospital serves a district where the prevalence of tuberculosis is 10 times the national average, it would appear from the comparison of our figures and those of Newton and Wilczynski (1979), collected nationally, that tuberculous meningitis in the elderly may be under-diagnosed.

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