

CASE SIX

Short case number: 3_22_6

Category: Neurology

Discipline: Medicine

Setting: Emergency Department

Topic: Cerebral abscess and cerebral infections including prion disease [SDL]

Case

Annette Hay, aged 29 years, presents following a seizure at a party. She is previously well although she states that she has been suffering headaches over the past few weeks and this is very uncommon for her. On examination there is evidence of papilloedema.

Questions

1. How would you acutely manage this scenario?
2. In a table, outline the management of bacterial abscess.
3. Summarise the key features of a spinal abscess and its diagnosis and management.
4. Tetanus remains common in the developing world. Outline its classical presentation, treatment and prevention.
5. Outline the key features of Creutzfeldt-Jakob Disease and its common variant.

Suggested reading:

- Colledge NR, Walker BR, Ralston SH, Penman ID, editors. Davidson's Principles and Practice of Medicine. 22nd edition. Edinburgh: Churchill Livingstone; 2014. Chapter 26.

ANSWERS

1. How would you acutely manage this scenario?

The most important consideration is investigation of the seizure especially in the presence of papilloedema and headaches. An urgent head CT scan is needed.

Whilst the scan is being organised, full history and physical examination are needed. This includes the history of headaches, any other associated symptoms (nausea, vomiting, with loss), any history of trauma, recent travel or contact with other people who have been unwell and family history. It is imperative to question regarding the use of IV drugs.

Physical examination includes neurological examination, breast examination and other possible sites of metastatic spread. Examination of the skin, cardiovascular examination and any evidence of endocarditis must also be undertaken.

1. In a table, outline the management of cerebral bacterial abscess

Site of abscess	Source of infection	Likely organism	Recommended treatment
Frontal lobe	Paranasal sinuses Teeth	Streptococci Anaerobes	Cefuroxime 1.5 g i.v. 8-hourly <i>plus</i> metronidazole 500 mg i.v. 8-hourly
Temporal lobe	Middle ear	Streptococci Enterobacteriaceae	Ampicillin 2-3 g i.v. 8-hourly <i>plus</i> metronidazole 500 mg i.v. 8-hourly <i>plus</i> either ceftazidime 2 g i.v.
Cerebellum	Sphenoid sinus Mastoid/middle ea	<i>Pseudomonas</i> spp. Anaerobes	8-hourly <i>or</i> gentamicin* 5 mg/kg i.v. daily
Any site	Penetrating trauma	Staphylococci	Flucloxacillin 2-3 g i.v. 6-hourly <i>or</i> cefuroxime 1.5 g i.v. 8-hourly
Multiple	Metastatic and cryptogenic	Streptococci Anaerobes	Benzylpenicillin 1.8-2.4 g i.v. 6-hourly if endocarditis or cyanotic heart disease Otherwise cefuroxime 1.5 g i.v. 8-hourly <i>plus</i> metronidazole 500 mg i.v. 8-hourly

2. Summarise the key features of a spinal abscess and its diagnosis and management.

The characteristic clinical features are pain in a root distribution and progressive transverse spinal cord syndrome with paraparesis, sensory impairment and sphincter dysfunction. Infection is usually haematogenous but a primary source of infection is easily overlooked. The resurgence of staphylococcal infection, often linked to intravenous drug misuse has contributed to a marked rise in incidence in recent years.

Plain X-rays of the spine may show osteomyelitis but such changes are often late. MRI or myelography should precede urgent neurosurgical intervention. Decompressive laminectomy with draining of the abscess relieves the pressure on the dura. This, together with appropriate antibiotics, may prevent complete and irreversible paraplegia. Organisms may be cultured from the pus or blood.

3. Tetanus remains common in the developing world. Outline its classical presentation, treatment and prevention.

Presentation

By far the most important early symptom is trismus-spasm of the masseter muscles, which causes difficulty in opening the mouth and in masticating; hence the name 'lockjaw'. Lockjaw in tetanus is painless, unlike the spasm of the masseters due to dental abscess, septic throat or other causes. Conditions that can mimic tetanus include hysteria and phenothiazine overdose, or overdose in intravenous drug misusers.

In tetanus, the tonic rigidity spreads to involve the muscles of the face, neck and trunk. Contraction of the frontalis and the muscles at the angles of the mouth leads to the so-called 'risus sardonicus'. There is rigidity of the muscles at the neck and trunk of varying degree. The back is usually slightly arched ('opisthotonus') and there is a board-like abdominal wall.

In the more severe cases, violent spasms lasting for a few seconds to 3-4 minutes occur spontaneously, or may be induced by stimuli such as moving the patient or noise. These convulsions are painful, exhausting and of very serious significance, especially if they appear soon after the onset of symptoms. They gradually increase in frequency and severity for about 1 week and the patient may die from exhaustion, asphyxia or aspiration pneumonia. In less severe illness, convulsions may not commence for about a week after the first sign of rigidity, and in very mild infections they may never appear. Autonomic involvement may cause cardiovascular complications such as hypertension.

Rarely, the only manifestation of the disease may be 'local tetanus'-stiffness or spasm of the muscles near the infected wound-and the prognosis is good if treatment is commenced at this stage.

Treatment

Treatment needs to be initiated as quickly as possible. The first step is to neutralise absorbed toxin by iv injection of 3000 U of human tetanus antitoxin. Prevent further toxin production by débridement of wound and administration of Benzylpenicillin 600 mg i.v. 6-hourly (metronidazole if allergic to penicillin).

Attention must be paid to control of symptoms by nursing in a quiet room, avoiding unnecessary stimuli and iv. Diazepam. If spasms continue, paralyse patient and ventilate.

Other general measures include hydration and nutrition, treatment of secondary infections if necessary.

Prevention

Active immunisation must be given. Contaminated injuries are treated by débridement. The immediate danger of tetanus can be greatly reduced by the injection of 1200 mg of penicillin followed by a 7-day course of oral penicillin. For those who are allergic to penicillin, erythromycin should be used. When the risk of tetanus is judged to be present, an intramuscular injection of 250 U of human tetanus antitoxin should be given, along with toxoid which should be repeated 1 month and 6 months later. For those already immunised, only a booster dose of toxoid is required.

4. Outline the key features of Creutzfeldt-Jakob Disease and its common variant.

Sporadic CJD usually occurs in middle-aged to elderly patients. Clinical features usually involve a rapidly progressive dementia, with myoclonus and a characteristic EEG pattern (repetitive slow wave complexes), although a number of other features such as visual disturbance or ataxia may also be seen. These are particularly common in CJD transmitted by inoculation. Death occurs after a mean of 4-6 months. There is as yet no known treatment.

Variant CJD

A variant of CJD (vCJD) has been described in a small number of patients, mostly in the UK. The causative agent appears to be identical to that causing BSE in cows, and it has been suggested that the disease appeared in humans as a result of the epidemic of BSE in the UK which started in the late 1980s. Patients affected by vCJD are typically younger than those with sporadic CJD and present with neuropsychiatric changes and sensory symptoms in the limbs, followed by ataxia, dementia and death, progressing at a slightly slower rate than patients with sporadic CJD (mean time to death is over a year). Characteristic EEG changes are not present but MRI scans of the head show characteristic high signal changes in the pulvinar in a high proportion of cases. The brain pathology is distinct, with very florid plaques containing the prion proteins. Abnormal prion protein has been identified in tonsil specimens from sufferers of vCJD, leading to the suggestion that the disease could be transmitted by reticulo-endothelial tissue (like TSEs in animals but unlike sporadic CJD in humans). This has caused great concern in the UK, leading to precautionary measures such as leucodepletion of all blood used for transfusion, and the mandatory use of disposable surgical instruments wherever possible for tonsillectomy, appendicectomy and ophthalmological procedures.