Wernicke's encephalopathy: a frequently missed problem

Wernicke's encephalopathy is a serious disorder caused by thiamine deficiency. It was described by Dr Carl Wernicke, a Polish neurologist, in 1881 as a triad of acute mental confusion, ataxia and ophthalmoplegia. Korsakoff's amnestic syndrome is a late neuropsychiatric manifestation of Wernicke's encephalopathy with memory loss and confabulation, hence the condition is usually known as Wernicke–Korsakoff syndrome or psychosis. In the UK it is usually seen in alcoholics and is a much more frequent condition then is commonly supposed.

The lesions in this disorder are characteristically seen in symmetrical distribution involving structures surrounding the third ventricle, aqueduct and fourth ventricle. The mamillary bodies are involved in virtually all cases (Charness and DeLaPaz, 1987).

In autopsy series typical brainstem lesions of Wernicke's encephalopathy were encountered in between 0.8 and 2.8% of the general population (Harper, 1983). This can be as high as 12.5% in a population of alcoholics. It has been described in many other situations where nutrition has been compromised (Lindboe and Loberg, 1989). These cases include AIDS, patients receiving dialysis, hyperemesis gravidarum, and malignancy with or without chemotherapy.

In this issue two reports of Wernicke's encephalopathy appear. One, by Ohara and colleagues on page 371, is in a patient with hyperemesis gravidarum. The authors point out that usually in this scenario it occurs after 4 or more weeks of vomiting. They also point out the high incidence of maternal and fetal morbidity. The second case by Lee et al on page 372 is more unusual, occurring in a case of acute pancreatitis in a known alcoholic. This is only the second report of such a case and illustrates how complete the response to therapy may be if treatment is started early enough.

CLINICAL PRESENTATION

Studies suggest that up to 80% of patients with the Wernicke–Korsakoff syndrome may not be diagnosed during life. Review of such cases showed that only 16% had the classical triad and 19% had no documented signs. Clearly in retrospective studies some of the symptoms and signs may have been missed (Harper et al, 1986). However, the magnitude of the difference suggests that clinical diagnosis may at times be difficult or impossible. In the authors' own hospital only five cases are listed in the hospital database in the past 5 years. Clinicians must be constantly aware of the possibility of Wernicke's encephalopathy.

Encephalopathy is characterized by profound confusion, disinterest and inattentiveness. There may be accompanying signs of alcohol withdrawal. Typically the oculomotor signs are of nystagmus, bilateral lateral rectus palsies and conjugate gaze palsies reflecting cranial nerve involvement of oculomotor, abducens and vestibular nuclei. Various horizontal and vertical gaze palsies, internuclear ophthalmoplegia, convergence disorder and optical bobbing may all be seen. Ptosis is uncommon but does occur.

Gait ataxia is likely to be a combination of polyneuropathy, cerebellar damage and vestibular paresis. Vestibular dysfunction without hearing loss is a common finding. In less severe cases patients walk slowly with a broad-based gait. However, gait and stance may be so impaired as to make walking impossible.

Hypothermia is common because of the involvement of the temperature-regulating centre. Hypotension is common but is also common in patients with significant liver disease. Rarely coma may be the sole manifestation (Wallis et al, 1978).

DIAGNOSTIC TEST

There is no specific laboratory test for diagnosing Wernicke's encephalopathy. Red cell transketolase levels reliably detect thiamine deficiency but are not necessary for the diagnosis of Wernicke's encephalopathy.

Imaging studies are not necessary in all cases. The computed tomography (CT) scan may be normal or it may show symmetrical low density abnormalities in periventricular areas, the diencephalon and the midbrain. Such symmetrical lesions are uncommon in other disorders. Magnetic resonance imaging scanning is more sensitive than CT and is probably the imaging modality of choice when diagnosis is suspected (Antunez et al, 1998).

It should be emphasized that Wernicke's encephalopathy is a clinical diagnosis and the investigations could be normal and can delay the treatment. This is particularly the case where malnutrition is likely to be present. The motto should be 'if in doubt, treat'.

The differential diagnosis for Wernicke's encephalopathy includes ruling out various brainstem and cerebellar syndromes that may occur as a result of vascular disease, both haemorrhage and infarction. Bacterial infection of the meninges and viral infection of the brain may need to be considered.

TREATMENT AND PREVENTION

Confused patients admitted to hospital are frequently given intravenous dextrose. This increases the need for thiamine and so may, at least in theory, precipitate Wernicke's encephalopathy. All heavy drinkers should be assumed to have thiamine deficiency. Heavy drinkers substitute alcohol for food. Thiamine deficiency may further be encouraged by diarrhoea and vomiting.

All patients with a clinical diagnosis of Wernicke's encephalopathy should be given intravenous thiamine. This should be followed up by prolonged oral thiamine. This should be given for many months until maximal resolution of the disease has occurred and the precipitating factors no longer exist.

Administration of thiamine usually leads to improvement of ocular signs within hours to a few days. Confusion and ataxia may take days or weeks to improve. Some damage may be permanent. Patients may be left with nystagmus, ataxia and Korsakoff's psychosis (Victor et al, 1989).

Delayed treatment of Wernicke's encephalopathy may lead to unnecessary permanent damage. It is better to treat needlessly then miss a case. All alcoholic seeking medical help should be given oral thiamine (intravenous if vomiting). There are no side effects of giving oral thiamine and it is cheap.

Addition of thiamine to food or beverages is more contentious. There is an Australian study which suggests putting it in bread may lower the incidence of Wernicke's encephalopathy in a general population (Harper et al, 1998). There is no evidence as yet that putting thiamine in alcoholic drinks would lessen the incidence of Wernicke's encephalopathy in abusers and more studies are required. HM

Waqar Azim/Robin Walker
Staff Grade Physician in Gastroenterology/
Consultant Gastroenterologist
Aintree Centre for Gastroenterology and Liver Disease
University Hospital Aintree
Liverpool L9 7AL

Antunez E, Estruch R, Cardenal C at al (1998) Usefulness of CT scan and MRI imaging in diagnosis of acute Wernicke's encephalopathy. *Am J Roentgenol* **171:** 1131–7

Charness ME, DeLaPaz RL (1987) Mamillary body atrophy in Wernicke's encephalopathy: antemortem identification using magnetic resonance imaging. *Ann Neurol* **22:** 595–600

Harper C (1983) The incidence of Wernicke's encephalopathy in Australia - a neuropathological study of 131 cases. *J Neurol Neurosurg Psychiatry* **46:** 593–8

Harper CG, Giles M, Finlay-Jones R (1986) Clinical signs in the Wernicke's-Korsakoff complex: a retrospective analysis of 131 cases diagnosed at necropsy. *J Neurol Neurosurg Psychiatry* **49:** 341–5

Harper CG, Sheedy DL, Lara AI at al (1998) Prevalence of Wernicke - Korsakoff syndrome in Australia: has thiamine fortification made a difference? *Med J Aust* **168:** 542–5

Lindboe CF, Loberg EM (1989) Wernicke's encephalopathy in non-alcoholics. An autopsy study. *J Neurol Sci* **90:** 125–9

Victor M, Adams RA, Collins GH (1989) *The Wernicke-Korsakoff Syndrome and Related Disorders due to Alcoholism and Malnutrition.* FA Davies, Philadelphia

Wallis WE, Willoughby E, Baker P (1978) Coma in the Wernicke-Korsakoff syndrome. *Lancet* **ii:** 400–1

KEY POINTS

- Wernicke's encephalopathy is caused by deficiency of thiamine.
- The most common cause relates to alcohol misuse.
- The classic triad of confusion, ataxia and ophthalmoplegia is not always present.
- It is underdiagnosed and, if untreated, can cause death or permanent damage.
- If suspicious give thiamine.

OBITUARY

Gerry Bennett

Gerry Bennett first worked at the London Hospital as an Senior House Officer in Geriatric Medicine in 1979. Following completion of his training at St. George's Tooting, he returned as a Consultant Physician in the Department of Health Care of the Elderly in 1984. Over nearly 20 years Gerry contributed actively to the clinical service, management, teaching and research of the department.

Upon appointment Gerry made a number of innovations in the clinical service: A consultant-led service where the consultants accept calls for admissions out of hours, a memory clinic, a pressure sore prevention group which subsequently led to the development of a complex wound care clinic, now the East London Wound Healing Centre based at Mile End. Gerry was an active clinician throughout his time in Tower Hamlets. His academic interests lead to Gerry being appointed Senior Lecturer in Health Care of the Elderly in 1992 and then Reader in 1995.

In July 2000 he was awarded a Personal Chair in recognition for his services to teaching and research. He was always an enthusiastic teacher taking an active and prominent role in developing the undergraduate curriculum at Queen Mary and Westfield College and before his death was involved in developing a multidisciplinary training environment at Mile End Hospital. In addition to teaching locally he lectured nationally and internationally on issues related to ageing, wound care and his specialist area of elder abuse.

He was an examiner locally for the University of London and also nationally for the Royal College of Physicians where he was a senior examination setter and external examination examiner for the Diploma in Geriatric Medicine. In 1995 he was invited to be a visiting Professor in Geriatric Medicine at Belfast University and this honour was again offered in 2001 by the Karolinska Institute of Medicine and Nursing in Stockholm, Sweden. Through his research and legal work in the area of elder abuse Gerry was established as the UK's foremost authority on the subject. In 1992 he founded the charity 'Action on Elder Abuse', the only charity dealing with the abuse of elderly people. At the time of his death he was President of the charity. In 1999 Gerry was asked to sit on both the United Nation's working party and the World Health Organization's working group on violence, as the European representative. He continued to work with the World Health Organization on research projects concerning elder abuse in developing countries.

In addition to his clinical, teaching and research commitments Gerry was also involved in management, firstly as Lead Clinician for the Department of Health Care of the Elderly and subsequently as Medical Director of Tower Hamlets Community Trust between 1994 and 1998.

Gerry Bennett had been a member of the editorial board of *Hospital Medicine* since January 1998.

It is difficult in a short article to encompass all the interests and work of an individual. Although his areas of work and expertise expanded over the years, Gerry remained loyal to the elderly population of Tower Hamlets. He was particularly proud of the links between the department and local general practitioners, the training offered in the department and the quality of care offered to frail elderly people. Always committed and enthusiastic, full of ideas, an advocate for older people and champion of services for elderly people, he will be missed by colleagues, patients and students alike.

Professor Gerald Bennett died in hospital on April 13 2003.

Keren N Davies
Consultant Physician
Department of Health Care of the Elderly
Mile End Hospital
London E1 4DG