the disease to aluminium toxicity, particularly to untreated water used to make the dialysate although possibly also to orally ingested antacids.\textsuperscript{1,2} The pathological changes in the brain at necropsy have consistently been non-specific and have not furnished an explanation as to the nature of the process.\textsuperscript{1,2}

While our patient had all of the typical features of dialysis encephalopathy, she had a superimposed demyelinating disease with the neuropathological findings of multiple sclerosis. It is of interest that the multiple sclerosis, a disease in which immune mechanisms are felt to play a central role,\textsuperscript{3} proceeded at a rapid pace in spite of the relative immunodeficiency occasioned by the setting of renal failure and chronic dialysis. We report this unusual case in the belief that understanding of the cause of dialysis encephalopathy may come from knowledge of which diseases may occur in its company.

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References

Circling movements in human viral encephalitis

Sir: Rotational and somersaulting movements have been observed secondary to experimental irritative lesions in monkeys at or near the vestibular association cortex in the temporal operculum.\textsuperscript{1} Circling or rotational movements as part of seizure disorder have occasionally been described\textsuperscript{2,3} and have been associated with lesions such as tumours, vascular infarcts, depressed fracture and aneurysm in the frontotemporal region.\textsuperscript{4} The following case documents circling movements in a child with presumed viral encephalitis.

A 5½-year-old right handed female child was hospitalised on 25 September 1980. Her birth and early development were normal. She developed persistent high grade fever without rigors lasting for four days two weeks prior to admission. Three days after the onset of fever she had two successive generalised tonic-clonic convulsions following which she remained unconscious for two days. She could not talk, hear or comprehend when she regained consciousness, and was incontinent of urine and faeces. She could sit and stand on her own, but each time she was made to stand she would rotate around her own axis toward the left.

On examination, at the time of admission, she was conscious but had a vacant look and could not recognise her parents. She did not talk or cry. She would open her mouth and bite any object brought near her. Ocular movements and the optic fundi were normal. There was a partial right facial paresis. There was no overt weakness in the extremities, but the right sided deep tendon jerks were brisk and the right plantar response was extensor. The most striking sign was the presence of circling movements. She would rotate in an anticlockwise (left) direction at a rate of 20–25 times/min, with her head and eyes turned to left, whenever she was made to stand (fig A). This activity continued until she was put to bed. She would revert back to anticlockwise rotation whenever forcibly rotated in the clockwise direction. The frequency of circling decreased one week after admission, and three weeks later it stopped. Instead she walked around aimlessly and grabbed at any object coming in front of her to put it in her mouth. This oral tendency decreased and disappeared after one month. At a recent follow up (19 January 1982), her mood was normal, she responded to her name and could comprehend some simple commands. She now recognised her parents and elder brother, and was able to communicate by gestures for food and urination, and she had began to speak a few words. Normal investigations included routine haematology, urine analysis, blood biochemistry, cerebrospinal fluid (CSF), negative syphilis serology and radiographs of chest and skull. Viral serological data on paired CSF samples showed no significant titre of complement-fixing antibody against measles, mumps, varicella – zoster, cytomegalovirus and herpes simplex. No virus was isolated in tissue culture. The first EEG recording obtained during sleep on 26 September 1980 showed bitemporal predominant delta slowing with suppressed voltage over the fronto-temporal region of the left hemisphere. There were no sharp complexes. The second EEG recorded a week later showed almost identical findings. Subsequent EEGs disclosed a tendency for reorganisation of the background with theta activity. In addition, prolonged bursts of spike discharge, well represented on the right hemisphere was evident. A CT scan (fig B) done on 30 December 1980 showed low density lesions bilaterally in the temporal regions, more on the upper and anterior part of the temporal lobes, much more evident on the left side. There was no mass effect and the lesion showed no enhancement with the contrast.

This patient had a rapid onset of illness associated with fever, convulsions and unconsciousness. The subsequent course was one of progressive recovery. She lost recognition of objects and people and speech and exhibited marked oral tendencies and emotional lability. The clinical syndrome is compatible with lesions of both temporal lobes (cf the Kluver-Bucy syndrome in experimental animals\textsuperscript{5}). The clinical and anatomical findings in our patient indicate a herpes simplex viral encephalitis. However, virological proof is missing, so the diagnosis is presumptive. Other viruses like canine distemper virus and the virus of foot and mouth disease are known to cause encephalitis associated with circling movements in the wild hedgehog, \textit{Erinaceus europeus}.\textsuperscript{6} These viruses were not tested in our patient. The
Figure (B) CT scan shows bitemporal non-enhancing low-density lesion, much more on the supero-anterior part of the left temporal lobe.

interesting part of this patient's clinical presentation was the circling movements. Rotational movements occurred as a transient epileptic phenomenon in the patient described by Schneider et al. In the present case they persisted for nearly one month, abated slowly, and were not associated with EEG evidence of seizure activity. In these respects, our patient probably is unique. The most effective lesion in monkeys to cause circling is in the neighbourhood of the vestibular area in the temporal operculum. Irritation of the vestibular cortical area, releasing the vestibular cortex from the inhibitory effects of other cortical regions which have been destroyed, or lesions at the association pathways have been shown to cause circling movements in animals. The circling towards the side of the lesion exhibited by the monkeys following unilateral ablation of the frontal cortex is presumed to be due to the removal of frontal lobe inhibition over the homolateral vestibular cortical area. In our patient with predominant left anterior temporal lesion, the persistent circling to the left may be due to a similar mechanism.

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References

 Opsoclonus in a confirmed case of St Louis Encephalitis

Sir: During the 1980 outbreak of St Louis Encephalitis, there were 56 confirmed and 17 suspected cases in Harris County, Texas. One of the confirmed cases had opsoclonus.

A 27-year-old white male was admitted to hospital on July 22, 1980, after being found comatose in a city park. In retrospect, the patient reported moving to Houston from Illinois in late June, 1980. He remembered a few days history of headache and sleepiness prior to admission. The patient had a temperature of 104°F. He was unconscious with only symmetrical withdrawal of the extremities to painful stimuli. No abnormality of the cranial nerves was found. The deep tendon reflexes were normal, but both plantar responses were extensor. Lumbar puncture revealed the CSF glucose was 0.8 g/l (simultaneous blood glucose, 112), and the protein was 1-01 g/l. There were 32 white cells (13 neutrophils and 19 lymphocytes) and 7 red cells. Routine, AFB and fungal stains and cultures were negative. Counterimmune electrophoresis and CF cryptococcal antigen were negative. A CT scan of the head was normal, but a chest radiograph showed a right lower lobe pneumonia. The patient initially was felt to have an aspiration pneumonia and a viral encephalitis. He was treated with gentamicin and penicillin G for the pneumonia, but later was switched to nafcillin when staphylococcal cultures grew Staphylococcus aureus. Two days after admission, the patient was lethargic and oriented to person only. Extraocular movements showed opsoclonus. The plantar reflexes were flexor. Repeat lumbar puncture gave an opening pressure of 22 cm of water. CSF showed a glucose of 0.62 g/l, protein 0.57 g/l, 70 white cells (64 lymphocytes and 6 neutrophils), and 35 red cells. Routine, fungal, and AFB cultures again were negative. An EEG was diffusely slow and poorly organized. The patient's mental status had returned to normal. The opsoclonus had disappeared, but ocular flutter was observed. The patient was discharged on August 6. The patient's mental status was clear. The patient returned to Illinois, and was lost to further follow-up.

Opsoclonus has been described in the following cases: the opsoclonus-palatal myoclonus syndrome; with acute cerebellar ataxia of childhood; in association with neuroblastoma; as a remote effect of carcinomas of the uterus, lung, and breast in association with an intracranial tumour and in neonatal opsoclonus. Although opsoclonus has long been associated with encephalitis, a specific viral aetiology has only rarely been documented. There is a case report of a 14-year-old girl with a benign encephalitis, opsoclonus, and myoclonic jerks of the neck and trunk, where the mumps culture was positive.