Letters

Periodic EEG activity in human rabies encephalitis

SIR,—The electroencephalographic abnormality of periodic EEG complexes has been described in general neurological disorders since 1950. Radermecker and Macken⁹ reported the periodic EEG complexes in subacute sclerosing panencephalitis and emphasised the diagnostic importance of these complexes. Jones and Nevin⁶ in 1954 described periodic sharp wave complexes in sub-acute vascular encephalopathy. In 1968, Gloor and Kalabay⁵ reported the occurrence of periodic discharges in diseases that spare the white matter and selectively involve the grey matter. Generalised periodic EEG complexes have also been reported in association with hepatic encephalopathy, herpes simplex encephalopathy, anoxic encephalopathy, and subcortical arterio-sclerotic encephalopathy.¹¹ We report for the first time periodic EEG activity in association with human rabies.

A 17 year old male was transferred to the neurological unit of Hacettepe University Hospital with lethargy and headache of one week duration. There was no history of animal bite. On examination he was drowsy and could

answer only a few simple questions. He was febrile 39°C. and had sinus tachycardia of 130 beats per minute. The general physical examination was normal. The cranial nerves were intact. Deep tendon reflexes were all symmetrically brisk and plantar response bilaterally extensor. There was no sensory impairment. Blood count showed lymphocytosis. CSF pressure, microscopic examination and protein content were normal. CT scan showed very small ventricles, but no evidence of a space occupying lesion. The patient's condition gradually deteriorated and on the 26th hospital day he had a left-sided convulsion. Twitching of the left side of the face and left limbs were noticed subsequently, followed by status epilepticus and he remained deeply comatose. The patient died after 66 days in hospital (most patients with rabies die within three to 10 days of the onset of symptoms^{8 9 10}). An initial clinical diagnosis of viral encephalitis was made. Post-mortem examination was performed and histopathology showed Negri bodies in some neurons. Animal inoculation for rabies was also positive.

The first EEG recording obtained on the second day of admission showed

alpha rhythm in the background and some 6-7 Hz activity maximal over the left and right temporal regions. The second EEG was recorded a week later and showed increased theta activity and infrequent bursts of 2-2.5 Hz activity mostly in the right temporoparietal region. Background rhythm was 6-7 Hz low amplitude beta activity. The third EEG was recorded when the patient had a left side convulsion and showed clear high amplitude periodic slow wave complexes in the right temporoparietal region (figure). During EEG recording diazepam was given intravenously and had no effect on the periodic complexes.

There is no general agreement on the pathologic substrate of periodic EEG activity. Different hypotheses have been put forward to explain their origin. It is reasonable to suppose that similar mechanisms underlie all examples of these complexes.^{1 11 7} Gloor and Kalabay⁵ believed that periodicity must be related to the recovery cycle of both cortical and subcortical structures. Cobb² previously suggested that periodic discharges are a consequence of extensive white matter damage which effectively disconnects the cortex from its normal afferent inflow originating at lower levels.

Figure EEG shows periodic generalised sharp-slow wave discharges. Discharges are larger in right hemisphere, and more marked temporoparietal region.

of the central nervous system. Periodicity therefore indicates structural or functional involvement of cortical and subcortical structures. Recently, another case of herpes simplex encephalopathy was noted² with similar generalised periodic events as in the present case. It was suggested that periodicity represents the time constant of recovery of an electrochemical process of the cellular level.

In the present case, the right hemisphere was first and mainly affected and discharges were marked on the right side. An injection of diazepam (iv 10 mg) had no effect on the periodic EEG complexes. However, Elliot⁴ reported three cases of Jacob-Creutzfeldt disease with EEG showing repetitive generalised synchronous spike and sharp wave triphasic complexes, but after injection of diazepam (10 mg) the periodic complexes were suppressed.

It is argued that various patterns represent different involvement of neuronal pathway.

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