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LETTER TO THE EDITOR

BRAINSTEM AUDITORY EVOKED POTENTIAL RESPONSE IN PERNICIOUS ANAEMIA

Sir,

(Received on October 15, 1990)

During our study of recording auditory evoked potentials in protein-calorie malnutrition in infants and young children (1), we came across a few cases of anaemia. The heamatological investigation-sincluding haemogram, showed that, of the five cases, two had megaloblastic anaemia, two had microcytic hypochromic and one had severe aplastic anaemia. Such neurological complications of various types of anaemias have not been documented except for pernicious anaemia, where classical sub-acuate combined degeneration of the spinal cord was first reported by Russell et al (2). Thereafter associated affection of the cerebral white matter and, more rarely, of the peripheral nerves have been amply documented. Direct relationship between optic nerve changes in the form of atrophy to the pernicious anaemia was documented by Cohen (3). However it is widely held that optic tract involvement in pernicious anaemia is rare (4-6). Patchy demyelination with affection of axis cylinders in the optic tracts has been reported in two cases of subacute combined degeneration (7). Identical changes have been found in experimental animals with induced B12 deficiency (8). Recently, Troncoso et al (9) have reported changes in visual evoked potentials in pernicious anaemia patients, suggestive of impairment of conduction in visual pathways. Now we report involvement of auditory pathways in our two pernicious anaemia cases using evoked potential recording procedure. However of the remaining three cases, two with microcytic hypochromic anaemia and one with severe aplastic anaemia, auditory brainstem evoked responses did not show any gross change and thus were normal.

Standard evoked potential recording technique was employed using Ag/AgCl disc electrodes anchored on scalp (CZ-A1 & A2 positions, 10-20 International System). Monaurally presented click stimuli, 2048 in number at 70 dBHL and 10/sec were used to evoke brainstem auditory potential responses (BAEPs) as in our other studies (1,10,11). The two male children (GK 3.5 Yr, and RK 4 Yr) had typical megaloblastic bone marrow, showing hypercellular, megaloblastic change with dyserythropoiesis. The BAEP records of one of them are shown in the figure, before and after therapy. It is clearly seen that before therapy BAEPs trace is of low amplitude, with indistinguishable wave complexes II, III, IV; the peaks of waves I & V are also not very sharp. After treatment with vitamin B 12 injection and oral vitamin B Complex (Inj-Neurobin 1 ml bwx5 and Syrup vit. B forte) for 30 days, the repeat BAEP record shows normal pattern with distinct waves I-V (even the late wave components VI & VII are also clearly visible) with much higher amplitude. The blood picture also improved with nearly normal looking bone marrow after 30 days of therapy. Besides absence of waves II, III, IV or their being inditinct, there is gross abnormality of reduction in amplitude of wave I & V (much so in Rt.side Fig. upper panel 2nd tracing). More than 50% reduction in amplitude reflects impairment in conduction in the pathways (12). On vit. B complex therapy, there is dramatic increase in amplitude of these waves indicating better neural conduction in auditory pathways. This preliminary report suggests that there is impairment of conduction in brainstem auditory pathways in pernicious anaemia, and that conduction improves on therapy. This is in agreement with the observations of Troncoso et al (9) who found impairment of visual pathways in pernicious anaemia. Further studies using BAEP

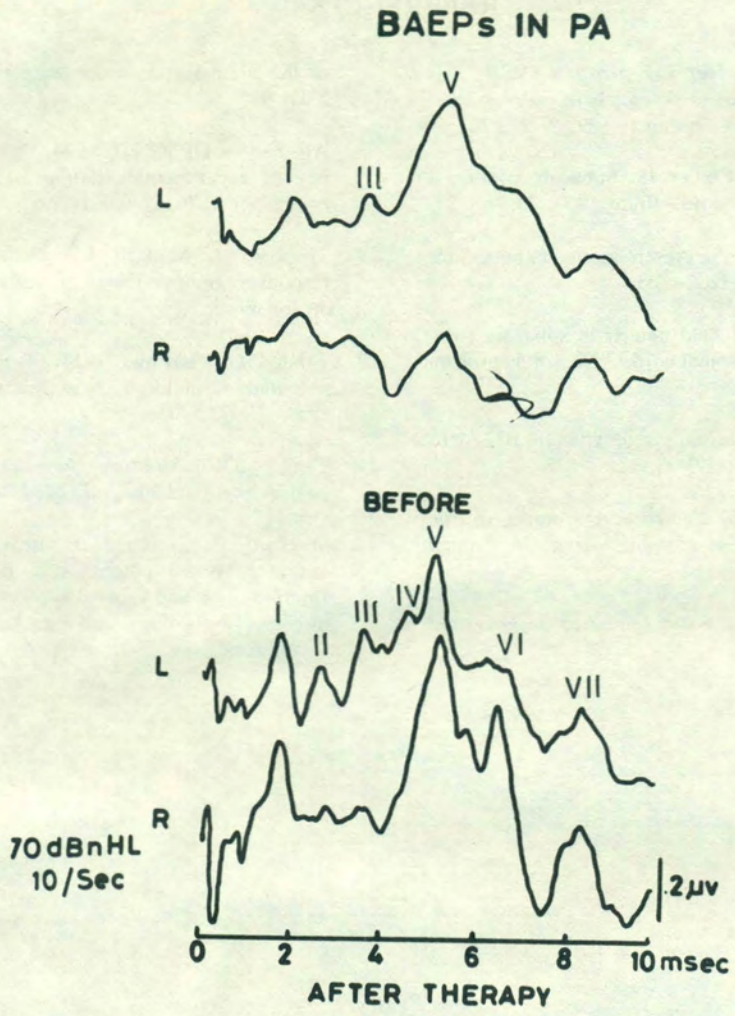

Fig. 1 : A representative record of Brainstem auditory evoked potential (BAEP) from a patient (GK 3.5) of pernicious anaemia (PA), before (upper panel) and after vit B complex therapy (lower panel). BAEPs in PA show low amplitude complex with indistinct or absent II, III, IV components. After treatment normal waveform, morphology and amplitudes are restored. L & R stand for left and right ear. While recording BAEP monoaurally the other ear was masked by pure white noise (-40dB).

in a large number of patients with pernicious anaemia may well demonstrate that auditory affection, especially subclinical, is a common and perhaps early manifestation of the disease, which improves on treatment.

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