

Modified Auditory Brainstem Responses (MABR) in Patients with Intracranial Lesions

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The standard auditory brainstem response (ABR) has not been reported as useful in detecting patients with intracranial lesions and mild or moderately increased intracranial pressure (ICP) within the ranges frequently encountered clinically (Goitein et al. 1983; Stone et al. 1988). The present investigation was designed to enhance the sensitivity of ABR testing in this patient population.

Methods

A standard ABR at two intensities (75 and 110 dB pe SPL) and a modified ABR (MABR) were performed in 106 consecutive patients with CT scan suspected (67) or surgically recorded (39) of increased ICP. MABR is a rapid rate (70/sec) binaural ABR performed at four different stimulus intensities (85, 75, 72, and 65 dB). Latency and amplitude, versus stimulus intensity function of wave V of the MABR were studied as were various latency (3SD) and amplitude (2SD) parameters of the ABR and MABR. Instrumentation and technical parameters were identical for pathologic and non-pathologic groups. The patient population was classified according to the etiology of elevated ICP into two groups; head trauma (56 patients, 53%), and non-trauma (50 patients, 47%). The non-trauma etiology was brain tumor in 22 cases, spontaneous hemorrhage in 13 cases, hydrocephalus in 11, and pseudotumor in 4.

Results

Most patients had mental status changes and 29% had a Glasgow Coma Score of 8 or less. Recorded ICP was predominately in the 16–25 mm Hg range. The MABR was abnormal in 88% (93 patients), whereas ABR was abnormal in less than one-half (49%) of patients. The standard ABR was normal in 45% of patients with an abnormal MABR. No case was noted to have a normal MABR and an abnormal ABR. Abnormality of MABR wave V latency/intensity function was the commonest finding (75% of cases). Diminished wave V amplitude was seen in 62% of cases and prolonged latency in 42%. Twenty one percent with an abnormal MABR had only a latency/intensity abnormality without signifi-

cant latency or amplitude changes. Analysis of variance with repeated measures (ANOVA) demonstrated a significant difference ($p < 0.05$) between the normative group and patient population (trauma and non-trauma) regarding MABR wave V latency/intensity and amplitude/intensity functions. Twenty-six of forty patients (65%) showed clear improvement or normalization of the MABR following surgical and/or medical treatment. Since MABR testing requires about 10 minutes to perform, in addition to the standard ABR, and improves the sensitivity of ABR in patients with intracranial lesions and mild to moderately increased ICP further investigation of this non-invasive approach is warranted.

References

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