The Effect of Binaural Noise and Sensitivity on Brain-Stem Evoked Response *

VIJAYASHREE

The present study was aimed at investigating whether there is any effect of binaural noise on the latency and amplitude of brain-stem response. The study was also aimed at finding out the effect on latency and amplitude of brain-stem response at different values of sensitivity.

The Electric Response Audiometer Model TA-1000 was used for the study. The study was divided into two parts. In Part I, 5 subjects (3 females and 2 males) with normal hearing in the age range of 18 to 23 years were selected. Logon stimuli were presented through the bone vibrator at 70 dB HL for 2048 samples at the rate of 5 stimuli/second in the absence and presence of the noise respectively. Narrow-band noise was presented binaurally through the earphones. Latency and amplitude of the brain-stem response were measured. Simulus frequencies employed were 2 KHz and 4 KHz at 70 dB HL. The noise levels selected were 77 dB SPL and 67 dB SPL at 2 KHz and 77 dB SPL at 4 KHz. The response latency and amplitude of I, III and V peaks of brain-stem response were noted for all the subjects. Data were analysed so as to obtain the means and standard deviations.

In Part II, 10 subjects with normal hearing (5 males and 5 females) in the age range of 18 to 23 years were selected. At different sensitivity values (0 2μV, 0-5μV, 1'0μV and 01μV) brain-stem evoked responses for the Logon stimuli were noted (Logon stimuli were presented to the right ear). The latency and amplitude of waves I, III and V were noted down for all the subjects. The stimulus frequencies employed were 2 KHz and 4 KHz at 80 dB HL. The data obtained were analysed statistically using Wilcoxon matched pairs signed rank test to find out if there is any significant effect on latency and amplitude of the brain-stem response at different sensitivity values.

Conclusions

The following conclusions can be drawn from the results obtained :

(1) There was increase in latency for peaks III and V obtained at 2 KHz in the presence of binaural noise (Noise level 77 dB SPL).

(2) There was increase in latency only for peak V obtained at 2 KHz in the presence of binaural noise (Noise level 67 dB SPL).

(3) There was increase in latency for peaks I and V obtained at 4 KHz in

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the presence of binaural noise (Noise level 77 dB SPL).

(4) There was a decrease in amplitude for peaks I, III and V obtained at 2 KHz in the presence of binaural noise at 77 dB SPL and 67 dB SPL respectively.

(5) There was a decrease in amplitude for peaks I, III and V obtained at 4 KHz in the presence of binaural noise (Noise level 77 dB SPL).

(6) There was an increase in interpeak latency (V - I) obtained at 2 KHz in the presence of binaural noise (Noise level 77 dB SPL and 67 dB SPL).

(7) There was an increase in interpeak latency (V — I) obtained at 4 KHz in the presence of binaural noise (Noise level 77 dB SPL).

(8) The change in sensitivity values has no significant effect on latency and amplitude of the peaks I, III and V obtained at 2 KHz and 4 KHz.

(9) The change in sensitivity value has no significant effect on interpeak latency (V - I) obtained at 2 KHz and 4 KHz.

(10) There was a change in the morphology of the waveform obtained at different sensitivity values (0-2μV, 0-5μV, 10μV and 0-1*μV)*.

Limitations of the Study

(1) Less number of subjects were used for the study.

(2) The effect of binaural noise was studied at only two frequencies and at only one intensity level (70 dB HL-Logon stimulus).

(3) The effect of sensitivity was studied at only one intensity level (80 dB HL-Logon stimulus).

Recommendations

(1) To carry out the study on a larger population.

(2) To study the effect of binaural noise at different intensity levels.

(3) To study the effect of sensitivity at different intensities.