

The Effect of Contralateral Noise on the Middle Evoked Response *

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The present study was aimed at investigating whether there is any effect of contralateral noise on the latency and amplitude of the VI, VII and P_o peak. Simultaneously, the study was also aimed at seeing if there was any change in the amplitude and latency of the V peak when measured using patient response interval of 10 msec, and 20 msec. And finally, the study attempted to find out if there was any difference between the combined amplitude of middle response and the binaural amplitude response.

The Electric Response Audiometer Model TA-1000 was used for the study. The study was divided into three experiments. In experiment-1, the latency and amplitude of the middle latency response was measured for eight normal females and seven normal males, in the presence and absence of contralateral noise. In experiment-2, six normal females and two normal males, who had acted as subjects in experiment-1, were taken as subjects and latency and amplitude of averaged evoked response was measured, while keeping the patient response interval at 10 msec. In experiment-3, seven normal females and three normal males having equal thresholds in both the

ears were taken for the study. Amplitude of the middle response from the left ear, right ear and when both the ears are stimulated binaurally, were recorded.

Conclusions

- (1) Clear VI peaks were obtained when tested at sensitivity $0.2\mu\text{V}$ in:
10/15 subjects at 2 KHz 80 dB HL ;
8/15 subjects at 2 KHz 100 dB HL ;
9/15 subjects at 4 KHz 80 dB HL ;
and
12/15 subjects at 4 KHz 100 dB HL.
- (2) Clear VI peaks in the presence of contralateral noise were obtained when tested at sensitivity $0.2\mu\text{V}$ in :
11/15 subjects at 2 KHz 80 dB HL ;
7/15 subjects at 2 KHz 100 dB HL ;
7/15 subjects at 4 KHz 80 dB HL ;
and
10/15 subjects at 4 KHz 100 dB HL.
- (3) Clear VI peaks were obtained when tested at sensitivity $1\mu\text{V}$ in :
6/13 subjects at 2 KHz 80 dB HL ;
6/13 subjects at 2 KHz 100 dB HL ;
5/13 subjects at 4 KHz 80 dB HL ;
and
10/13 subjects at 4 KHz 100 dB HL.

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- (4) Clear VI peaks in the presence of contralateral noise were obtained when tested at sensitivity $1 \mu V$ in :
 1/13 subjects at 2KHz 80 dB HL ;
 5/13 subjects at 2 KHz 100 dBHL ;
 2/13 subjects at 4 KHz 80 dBHL ;
 and 8/13 subjects at 4 KHz 100 dBHL.
- (5) In all the subjects, except 3 subjects, for the VI peak there was either a decrease or no change in latency when measured in the presence of contralateral noise at 2 KHz and 4 KHz, with sensitivity at $0-2 \mu V$.
- (6) In all the subjects having clear VI peaks, there was a decrease, or in some no change in latency when measured in the presence of contralateral noise at 2 KHz and 4 KHz keeping sensitivity at $0-2 \mu V$.
- (7) Clear VII peaks were obtained when tested at sensitivity $0-2 \mu V$ in :
 5/15 subjects at 2 kHz 80 dB HL ;
 5/15 subjects at 2 kHz 100 dB HL ;
 3/15 subjects at 4 kHz 80 dB HL ;
 and 7/15 subjects at 4 kHz 100 dBHL.
- (8) Clear VII peaks in the presence of contralateral noise were obtained when tested at sensitivity at $0-2 \mu V$ in :
 4/15 subjects at 2 KHz 80 dB HL ;
 6/15 subjects at 2 KHz 100 dBHL ;
 2/15 subjects at 4 KHz 80 dBHL ;
 and 2/15 subjects at 4 KHz 100 dB HL.
- (9) Clear VII peaks were obtained when tested at sensitivity at $1 \mu V$ in :
 2/13 subjects at 2 KHz 80 dB HL ;
 4/13 subjects at 4 KHz 100 dB HL ;
 None of the subjects at 4 KHz 80 dB HL ;
 and 5/13 subjects at 4 KHz 100 dB HL.
- (10) Clear VII peaks in the presence of contralateral noise were obtained when tested at sensitivity at $1 \mu V$ in :
 None of the subjects at 2 KHz 80 dBHL; 4/13 subjects at 2 KHz 100 dB HL ; 2/13 subjects at 4 KHz 80 dB HL ; and 3/13 subjects at 4 KHz 100 dB HL.
- (11) Clear Po peaks were obtained when tested at sensitivity at $0-2 \mu V$ in :
 1/15 subjects at 2 KHz 80 dB HL ;
 7/15 subjects at 2 KHz 100 dB HL ;
 3/15 subjects at 4 KHz 80 dB HL ;
 and 4/15 subjects at 4 KHz 100 dB HL.
- (12) Clear Po peaks in the presence of contralateral noise were obtained when tested at sensitivity at $0-2 \mu V$ in :
 4/15 subjects at 2 KHz 80 dB HL ;
 7/15 subjects at 2 KHz 100 dB HL ;
 3/15 subjects at 4 KHz 80 dB HL ;
 and 5/15 subjects at 4 KHz 100 dB HL.
- (13) Clear Po peaks were obtained when tested at sensitivity at $1 \mu V$ in :
 1/13 subjects at 2 KHz 80 dB HL ;
 7/13 subjects at 2 KHz 100 dB HL ;
 4/13 subjects at 4 KHz 80 dB HL ;
 and 6/13 subjects at 4 KHz 100 dB HL.

- (14) Clear Po peaks in the presence of contralateral noise were obtained when tested at sensitivity at $1\mu V$ in :
 2/13 subjects at 2 KHz 80 dB HL ;
 6/13 subjects at 2 KHz 100 dB HL ;
 2/13 subjects at 4 KHz 80 dB HL ;
 and 6/13 subjects at 4 KHz 100 dB HL.
- (15) In all the subjects having clear Po peaks at sensitivity $0-2\mu V$, there was a decrease in latency at high intensity levels above 60 dB HL at 2 KHz and 4 KHz in the presence of contralateral noise. Whereas at 80 dB HL for 2 KHz and 4 KHz, the change in latency in peak Po in the presence of contralateral noise was variable.
- (16) In all the subjects having clear Po peaks at sensitivity = $1\mu V$, there was a decrease in latency when measured in the presence of noise at 2 KHz and 4 KHz.
- (17) Increase in sensation level does not bring about consistent increase in amplitude and decrease in latency in the middle evoked response.
- (18) There was no significant change in latency and amplitude of the V peak when measured at 4 KHz 80 dB HL with patient response intervals of 10 and 20 msec.
- (19) There was significant difference between the latency values of V peak (2 KHz 80 dB HL) obtained at 10 msec, and 20 msec ; patient response intervals.
- (20) There was no significant difference between the amplitude values of peak V (2 KHz 80 dB HL) obtained at 10msec. and 20 msec, patient response interval".
- (21) The amplitude of Po peak was greater in binaural stimulation than in monaural stimulation.
- (22) Difference in amplitude for monaural and binaural response may be explained in terms of Kadobayashi *et al.* (1984) finding that for peak Po, impulses from the right and left ear, elicit the response in the brain-stem.

Limitations of the Study

- (1) A small population is tested.
- (2) The latency range is limited to 20 msec.
- (3) The age range is limited.

Recommendations

- (1) To carry out the study on a larger population, using stimulus rate of 5 stimuli per second.
- (2) To study the effect of contralateral noise on middle response by using patients response interval of 100 msec.
- (3) To study the effect of patient response interval on V peak using a larger population.
- (4) To study Binaural Interaction for peaks Pa and Pb of the middle latency response.