A Comparative Study of Reflex Thresholds for Pure Tone, Narrow Band Noise and Wide Band Noise in Normal Hearers and Sensori Neural Hearing Loss Cases*

MYTHILI, M. A.

Middle ear muscle reflex was elicited using different acoustic stimuli such as pure tone, narrow band noise and wide band noise. The test was administered on 100 normal hearing subjects, and 15 subjects with moderate sensori-neural hearing loss.

From the results obtained the following conclusions are tenable :—

1. In normal population the mean of the reflex thresholds for pure tones of 500 Hz, 1000 Hz and 2000 Hz are 93·25 dB SPL, 88·75 dB SPL and 88·35 dB SPL respectively and the pure tone average is 90·12 dB SPL.
2. The mean of the reflex thresholds for various narrow bands of noise centered around 500 Hz, 1000 Hz and 2000 Hz are 76 dB SPL, 72·97 dB SPL and 72·65 dB SPL respectively with an average of 73·84 dB SPL.
3. The mean intensity for wide band noise in normal hearing subjects is 66·7 dB SPL.
4. The reflex activity of the Middle Ear Muscle is significantly different for different stimuli, both in normal and clinical population.
5. The normative data obtained does not apply to groups of children below 17 and adults above 29 years of age.
6. In subjects with sensori-neural hearing loss the average PTA, NBNA and WBN obtained are 111·95 dB SPL, 107·55 dB SPL and 105·33 dB SPL respectively.
7. In subjects with sensori-neural hearing loss the gap between the reflex thresholds for tone and noise (T–N gap) is reduced when compared to the T–N gap in normal subjects.
8. The reflex activity of the middle ear muscles for noise is more stable than that for tone.
9. The middle ear muscle action is both frequency and intensity dependent.
10. The middle ear muscle action is very much altered in case of sensori-neural hearing loss.
11. Regardless of the method adopted—ascending or descending—in obtaining the reflex threshold, results do not differ.
12. There is no significant difference in the middle ear muscle activity between two sexes.

* Master's Dissertation, University of Mysore, 1975.

Implications

1. The presence of reflex and reflex threshold enables us to differentially diagnose normals and sensori-neural hearing loss subjects.

2. Presence or absence of reflex denotes the severity of sensori-neural hearing loss.

3. The effect of various acoustic stimuli on the middle ear muscle action can be understood.

4. The difference between the reflex thresholds for pure tone and noise acts as a factor for diagnosis.

5. The study being first of its type in India provides scope for further research.

Limitations of the Present Study

1. The reflex measured in this study is that of contralateral ear which is less sensitive than ipsilateral reflex (Moller, 1962).

2. Latency period of initiation of middle ear muscle contraction for acoustic stimuli may affect the reflex threshold.

3. Sample may not be an adequate representative of the Indian population.

4. Subjects with severe sensori-neural hearing loss could not be tested as it was difficult to elicit reflex in them due to audiometric limitation.

Future Research Possibilities

1. Meaningful and meaning less speech materials can be used to investigate their effect on acoustic reflex threshold along with other stimuli for possible relationship to help in differential diagnosis.

2. Using filtered noise the effect of critical bands of noise on acoustic reflex threshold may be studied.

3. Difference between contralateral and ipsilateral reflex may be studied.

4. Further work on standardization of the test can be carried out.