Verification of the Hypothesis—"Recruitment is an Artifact"*

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An attempt was made to verify whether recruitment is a fact or an artifact. Three experiments were carried out.

Experiment I was the comparison of acoustic stapedial reflex thresholds (ART) obtained before and after inducing temporary hearing loss (cochlear) in 10 normal hearing subjects, at 1 KHz and 2 KHz. After sufficient time gap, the procedure was repeated on 4 subjects for test–retest reliability. Statistical significance has been determined.

In Experiment II, the reflex thresholds at 250, 500, 1 K, 2 K and 4 KHz, of typical moderate sensori-neural hearing loss cases with no tone decay, were compared with that of normal reflex thresholds. After sufficient time gap the measurements were repeated on 5 subjects for test–retest reliability.

In Experiment III, screening ABLB was administered on 4 cases with unilateral high frequency sensori-neural hearing loss. The test was administered at the highest bilateral normal hearing frequency. The hearing level at which a pure tone sounds equally loud in the normal ear, when a reference tone of 80–90 dB HL was fed to the affected ear was determined. The interaural intensity difference at the point of balance was determined.

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Conclusions

(1) The difference in loudness, experienced by normal ear and the ear with induced hearing loss (cochlear) is negligible.

(2) The difference between the acoustic reflex threshold of moderate (40–70 dB HL ISO 1964) typical sensori-neural hearing loss cases without tone decay and acoustic reflex thresholds of normal ears is less than 10–15 dB.

(3) The stapedial reflex thresholds are elevated in sensori-neural hearing loss cases, by approximately 10–15 dB as to compensate the loudness loss resulting from the elevated pure tone thresholds.

(4) The growth of loudness in abnormal ears is not abnormal, as shown by the I and II experiments. So, recruitment, a presumed abnormal growth of loudness, is an artifact.

(5) Decruitment, a presumed abnormal slow growth of loudness, an artifact.

Implications

(1) As recruitment is an artifact, it no longer stands as an indicator of cochlear pathology. So, the ABLB

(automatic presentation) test may not be valid in differential diagnosis of cochlear *vs.* retro-cochlear hearing impairment. It can only be used to differentiate between conductive and sensori-neural impairment.

(2) The concern expressed by many investigators regarding a typical findings in surgically confirmed acoustic neuroma cases is unwarranted.

Recommendations for Further Research

(1) The first and second experiments may be carried out with air-tight sealing in the probe ear, obtaining clear knowledge about the middle ear which would be beneficial as supportive studies.

(2) ABLB automatic presentation and ABLB manual presentation methods may be tried on hearing loss cases exhibiting tone decay of different degree.

(3) Investigations on cases exhibiting 'hyper-recruitment' may be carried out.