

Abstract EFAS/DGA 2007

Analog versus digital hearing aids in patients with noise-induced hearing-loss

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Introduction: A major consequence of noise-induced sensorineural hearing loss (NIHL) is the difficulty in understanding of speech, especially in noisy or reverberant listening environments; this may be improved, at least in part, by the provision and fitting of hearing aids. The aim of the present study was to compare the effectiveness of audiologic rehabilitation of NIHL patients by means of analog (AMA) versus digital hearing aids (DHA). **Methods:** Forty-six adult listeners (7 women and 39 men, aged 46–77 years), suffering from NIHL of varied degrees, participated in the investigations. Pure tone air-conduction and bone-conduction threshold were obtained bilaterally. Speech intelligibility was measured at 65 dB SPL in free field in the unaided and aided (AHA vs. DHA technology) listeners to check the benefit of using both types of the instrument. Next, the questionnaire tests: Abbreviated Profile of Hearing Aid Benefits (APHAB), International Outcome Inventory-Hearing Aid (IOI-HA) and Nordiska Samarbetsorganet for Handikapfragar (NSH) were carried out.

Results: The statistical evaluation of findings showed a significant difference in speech intelligibility, amounting to over 30%, between the unaided vs. aided (both AHA and DHA) patients; the average quantitative benefit was greater by 7% for DHA. As regards the subjective feelings of the patients, the major advantages of the DHA application were reported in the APHAB questionnaire, namely the improvement in speech recognition in the conditions of reverberation (RV), background noise (BN) and aversiveness (AV). Also, responses to the IOI-HA test confirmed the virtues of DHA wearing; every second patient wore it for the whole day. Accordingly to the results of NSH examination, DHA was favored by 39 persons vs. 2 persons who preferred AHA and 5 persons giving no answer; in addition, it turned out that DHA was used for 8 h and more by 65% of tested patients (vs. 33% of those with AHA), for 4–8 h/day by 31% (vs. 52% of those with AHA) and for less than 4 h/day by 2% (vs. 6% of those with AHA).

Conclusions: Although digital hearing aids seem to be in general more acceptable as those better improving the ability to understand speech among listeners with NIHL, a final choice of the hearing aid should be based on the patient's individual preferences.

