PS 770

Patients with Normal Auditory Thresholds but Difficulty Listening in Noisy Environments: Willingness to Complete Auditory Training

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Background

There are no treatment options for patients with normal audiograms who complain about their ability to listen in noisy environments. Hearing aids and assistive listening devices, for example, are based on fitting strategies calculated for auditory thresholds and are thus not appropriate in these patients. However, we hypothesize that Auditory Training may be a treatment option for this group of underserved patients. It is clear that Auditory Training can help improve listening in noise ability for patients with severe to profound hearing losses or after cochlear implantation. As an initial step of recruiting subjects to address our hypothesis, we determined the prevalence of patients seen at our university hospital with normal audiograms and difficulty listening in noise.

Method

We used an established database of all patients seen by our Otolaryngology Department to identify those with normal auditory thresholds. We used a telephone-based, 14-item questionnaire designed to assess these people's degree of difficulty listening in the noisy environments, and willingness to be a participant to determine the extent to which they can benefit from Auditory Training.

Results

A total of 11,938 hearing tests were recorded between January 5, 2012 and August 27, 2015. Bilateral, normal pure tone threshold averages (PTAs) at mid-frequencies (0.05, 1, and 2 kHz) were found in 2,654 patients. We successfully contacted 474 of these people who were willing to complete the questionnaire. The number of people with normal PTAs and difficulty listening in noisy environments was 159, 70% of whom were willing to complete an Auditory Training program. When we considered only those patients with normal PTAs in both mid- and high-frequency (3, 4, 8 kHz) ranges, the number of these patients with difficulty listening in noise was 97, 74% of whom would complete Auditory Training.

Conclusions

These results can guide recruitment expectations for studies on the increasingly popular condition of "hidden hearing loss" – degraded performance on difficult tasks such as listening in noise despite normal performance on simple tasks like detecting pure-tone thresholds (Schaette & McAlpine 2011). Of the hearing tests performed at our institution over a 44 month period, 0.93% of the patients had normal mid-frequency PTAs, difficulty listening in noisy environments, and would complete Auditory Training. However, only 0.35% of all patients had normal PTAS in both mid- and high-frequency regions, difficulty listening in noisy environments, and would be a study participant.

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Evaluating the Effectiveness of Interventions to Prevent or Treat Hearing Disorders

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Otolaryngologists and other healthcare professionals have to make decisions involving prevention or treatment of hearing disorders on a routine basis. In order to adopt an evidence-based practice (EBP), such decisions should be guided by high-quality scientific knowledge. While there is consensus that EBP is a desired approach, it is not always clear what is meant by the term and what has to happen to claim that your practice is evidence-based. Unfortunately, there is a misconception that evidence supporting effectiveness can range from a "success story" based on a single example to high quality evidence involving formalized testing through cross-sectional or, better yet, prospective experimental design. A stronger quality and quantity of evidence than a single case study in a specific environment with a specific group of affected individuals is required for practices to be accepted as evidence-based. In this presentation we will describe the principles of EBP as they apply to the evaluation of interventions to prevent or treat hearing disorders. We will introduce approaches used for intervention effectiveness research, systematic reviews of the literature, the Cochrane Systematic reviews, and discuss strategies for the collection of evidence about different interventions. Examples will be provided on the best available evidence using different types of interventions for treatment of hearing loss, such as cochlear implants, and prevention of noise-induced hearing disorders. We will highlight where further evidence is needed, and recommend how further evidence should be collected and applied in the clinic.

Disclaimer: The findings and conclusions in this abstract have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

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Auditory Assessment Using the Pupillary Dilation Response

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Hearing assessment is easy in cooperative children and adults, but is more difficult in people, such as infants, who cannot provide a reliable voluntary response. Here, we report results that suggest that the pupillary dilation response (PDR) may be useful in assessing hearing in the latter population.

While many phenomena can produce changes in pupil diameter, the term pupillary dilation response refers to a novelty-elicited dilation - one of a suite of autonomic responses that comprise the orienting response (OR). The PDR is a short-latency, multi-component response in which a quick dilation is followed by a brief constriction and then

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