High definition distortion product otoacoustic emission (DPOAE) as screening tool for normal hearing tinnitus patients: clinical data and case histories.

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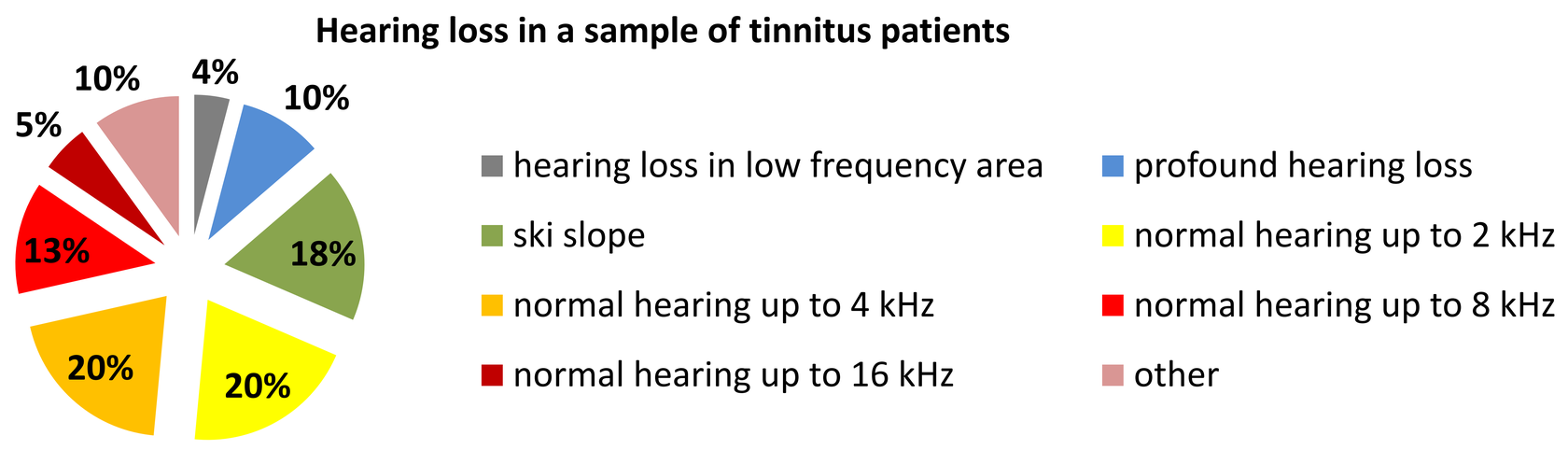
Introduction

In a previous poster, we reported that even if tinnitus and hearing loss often co-exist, nevertheless an important percentage (18%) of 270 patients reporting tinnitus showed a normal hearing threshold defined as pure tone audiometry (PTA) maximum threshold 20dB HL for frequencies between 250 and 8 kHz in both ears (with type A tympanogram and contra-lateral stapedial reflex recordable at the threshold). In particular, 5% of patients with normal PTA reported a normal audiogram up to 16 kHz.



In clinical practice is very important to investigate these " pseudo normal hearing" tinnitus patients in order to find any cochlear damage potentially trigger of tinnitus. The damage to outer hair cells is believed to be involved in the development of tinnitus in individuals with a normal hearing at PTA. Recording of distortion product otoacoustic emissions with a high definition protocol (hd DPOAEs) can provide a sharp analysis of the outer hair cells that can identify small areas of cochlear damage.

Methods

We screened 14 tinnitus patients (29 year average age) reporting with hd DPOAEs. hd DPOAEs are recorded at frequencies as high as 8 kHz with up to 10 points/octave. The control group (12 subjects, 21 average age) was recruited among people not affected by tinnitus with PTA maximum threshold 20dB HL (for frequencies between 250 and 16 kHz) in both ears.

Results

hd DPOAE data of normal hearing tinnitus patients are significant reduced respect of a control group ($p=0.04$). An tinnitus patients example:

Conclusions

According to Ami et al. (2008), our preliminary results seem to confirm that tinnitus patients, even if with normal hearing at PTA, show a cochlear suffering. So the coclea seems to be at least partially damaged in tinnitus patients.