Abstract 1.

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Title: The role of noise exposure in 'hidden hearing loss'.

Background: Some adults, particularly those with a history of noise exposure, report hearing problems, especially understanding speech in background noise yet their hearing test results are clinically normal. Recent animal studies suggest that such difficulties might be the result of noise-induced damage to the synaptic connections between auditory nerve fibres and inner hair cells. Although this has not yet been reliably demonstrated in humans, the term hidden hearing loss (HHL) has been coined to describe the perceptual difficulties with which noise-exposed people commonly present, and this study is one of the first large-scale investigations to comprehensively examine HHL in adults.

Methods: We have implemented a comprehensive behavioral test battery comprising an online survey, audiology, and auditory processing tests plus a range of cognitive measures to investigate the effects of noise exposure on speech-in-noise perception and other auditory abilities in a large group of adults, aged 30-55 years with clinically normal hearing thresholds.

Results: Initial results show a significant correlation between the amount of noise exposure people have and the degree of self-reported difficulty they describe understanding speech in background noise. However, there is wide variation in performance across the cohort and this appears to be related to factors such as temporal coding, attention, memory and olivocochlear suppression of background noise.

Conclusions: This work contributes to our understanding of HHL in humans and has the potential to inform the development of individualized diagnostic procedures for people presenting with symptoms of HHL.