

“Genetic susceptibility to bilateral tinnitus in a Swedish twin cohort”

Researchers from the Karolinska Institute (Stockholm, Sweden) and GENYO (Granada, Spain) would like to announce our recent acceptance of an original peer-reviewed research in the journal *Genetics in Medicine* from the Nature Publishing Group (impact factor 7.71). This work presents the very first evidence of a genetic contribution to specific forms of tinnitus with data obtained with the Swedish twin registry.

Tinnitus, the ringing in the ears, is considered an age-related symptom that is experienced by 70 million people in Europe. For 1-2% of them, tinnitus is an extremely bothersome condition with highly unmet clinical needs (1), and which distress impacts daily life activities, work productivity and sleep. There are currently no efficient ways of suppressing tinnitus. Indeed, most of the clinical trials have had mixed success (2) and it is thought that the heterogeneity of tinnitus is the underlying cause. Classifying tinnitus patients according to subtypes is of major clinical importance, however what constitutes a tinnitus subtype remains unknown (3).

The few studies that investigated the heritability of tinnitus have suggested a negligible contribution of genetic factors emphasizing on the major contribution of environment to the phenotype (4). We recently broke this dogma by showing that different forms of tinnitus can show significant heritability and thus a predominant genetic influence over environmental factors. These findings were obtained using twins, which is a standard approach to evaluate the genetic influence to specific traits.

When considering tinnitus as a whole, we found similar heritability values as previously reported. However, when breaking down the groups according to genders and to tinnitus being heard on one ear (unilateral) or on two ears (bilateral), then we found that bilateral tinnitus reached a heritability of 0.68 in men, which is near what is found in Autism and ADHD.

These results are surprising and unexpected since they reveal that, unlike what is typically thought of tinnitus being a purely environmental condition, the bilateral ringing in the ears is genetically influenced, and gender biased. These findings also prove that bilateral tinnitus and unilateral tinnitus are not alike and thus constitute two different subtypes, the first one being genetically influenced, the other not. These findings are of major clinical and public health relevance since they establish a milestone in tinnitus research.

This work is the result of the converged efforts of multiple research groups from the TINNET consortium (<http://tinnnet.tinnitusresearch.net/>), which is a European network of tinnitus researchers.

References

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