

Tinnitus severity correlated with zinc, copper, risk factors: a large-scale case-control study

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Abstract

Objectives This large-scale case-control study aimed to explore the trace elements (Zn & Cu) and risk factors associated with tinnitus severity (mild and moderate-to-severe tinnitus).

Methods The serum levels of Zn & Cu of participants were measured by inductively coupled plasma mass spectrometry (ICP-MS). The potential risk factors were analyzed by simple and multiple logistic regression analysis.

Results Compared mild tinnitus with moderate-to-severe tinnitus, the serum Zn of participants had a significant difference ($P=0.05$), and only the age variable displayed an evident difference in main clinical characteristics analysis table ($P<0.05$). Under a multivariable-adjusted analysis, the potential risk factors included hearing loss (AOR: 1.704, 95% CI: 1.009-2.880), HADS-A (borderline abnormal, AOR: 2.876, 95% CI: 1.248-6.625; abnormal, AOR: 12.149, 95% CI: 2.722-54.218), AIS (slight sleep problems, AOR: 2.030, 95% CI: 1.061-3.885; probable/definite insomnia, AOR: 6.955, 95% CI: 3.669-13.185), ear-self-cleaning (<1 t/w, AOR: 2.117, 95% CI: 1.178-3.805; 3-6 t/w, AOR: 2.462, 95% CI: 1.081-5.607; $[?]7$ t/w, AOR: 2.472, 95% CI: 1.041-5.868), tea consumption (AOR: 1.138, 95% CI: 1.052-1.231) and sleep apnea (AOR: 1.805, 95% CI: 1.036-3.145). Next, a stratified analysis was made on these risk factors, and the results showed that the low levels of Zn were significantly associated with tinnitus severity in hearing loss group—both in “no” and “yes” subgroups (“no”, AOR: 2.588, 95% CI: 1.348-6.061; “yes”, AOR: 4.213, 95% CI: 1.106-8.430), and in HADS-A group—only in “normal” subgroup (AOR: 2.928, 95% CI: 1.790-6.984).

Conclusions Serum Zn deficiency and potential risk factors (including hearing loss, tea consumption, sleep apnea, anxiety, insomnia and ear-self-cleaning habit) were significantly correlated with tinnitus severity. Intervention with these risk factors could prevent the mild tinnitus from becoming moderate-to-severe tinnitus.

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