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Repeated sessions of bilateral transcranial direct current stimulation for tinnitus treatment: a double-blinded randomized controlled clinical trial

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Statement of the Problem: Transcranial direct current stimulation (tDCS) has shown therapeutic efficacy on chronic intractable tinnitus. However, the findings are controversial and most of the studies focused on the short-term effects of single session tDCS. This study aimed to investigate the therapeutic effects of repeated sessions of bilateral tDCS over auditory cortex (AC) on tinnitus loudness, tinnitus related distress, and tinnitus handicap inventory (THI) score.

Methods: A double-blinded randomized placebo controlled parallel trial was conducted on patients (n=40) with chronic intractable tinnitus (>2 years). Participants were randomly assigned into two groups of real bilateral tDCS (n=25), anode left/cathode right AC, or placebo treatment (n=15). Daily 20 min session of 2 mA current for 5 consecutive days per week and 2 consecutive weeks (total 10 sessions) with 35 cm² electrodes were applied. THI was assessed before and after intervention, and at one month follow-up. The tinnitus loudness and distress were assessed using a 0-10 numerical visual analogue scale (VAS) before intervention, and immediately, one hour, one week and one month after last stimulation.

Findings: Ten sessions anodal tDCS significantly reduced THI after last session and after 1-month follow-up ($P < 0.001$), in 18 of 25 participants. In addition, significant reduction in distress VAS and loudness VAS were found ($P < 0.001$). The sham tDCS showed no statistically significant differences for any response variables. Age, sex, evolution time, laterality, basal THI, basal distress and basal loudness VAS showed no significant correlation with the treatment response.

Conclusion: The repeated sessions of bilateral tDCS over AC significantly improved the tinnitus symptoms and the improvements lasted one month after intervention. The repeated sessions of tDCS may serve as a potential therapeutic option for intractable and chronic tinnitus.

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The Association between Acculturation and Cognitive function among Chinese elderly in Chicago

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Acculturation is an important cultural process that may contribute to the risk of cognitive impairment for Asian immigrants in the U.S. Unfortunately, minimal research has used acculturation instrument to examine its role in cognitive functioning. The aim of this study was to assess the association between acculturation and cognitive function among Chinese older adult in Chicago. Data were obtained through the Population Study of Chinese Elderly in Chicago (PINE) study. The PINE Study Acculturation Scaled (range: 12-60) was used to assess level of acculturation in three dimensions: language preference, media use, and ethnic social relations. We also administered five cognitive function tests: the Chinese Mini-Mental State Examination, the immediate and delayed recall of the East Boston Memory Test, the Digit Span Backwards assessment, and the Symbol Digit Modalities Test. Spearman correlation coefficients were used to examine the relationship between acculturation and cognitive function. Our study indicates lower levels of acculturation among Chinese elderly with the mean scores 15.3 ± 5.1 . Older age, more offspring, lower income, fewer years living in the U.S, lower overall health status, and lower quality of life were associated with the lower levels of acculturation. Data analysis revealed that the level of acculturation was strongly associated with cognitive function. Specifically, language preference ($r=0.34$, $p<.001$), media use ($r=0.25$, $p<.001$), and ethnic social relations ($r=0.30$, $p<.001$) were significantly correlated with higher global cognitive score. The level of acculturation is significantly related to cognitive function among the Chinese older adults in Chicago. Future longitudinal studies are needed.

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