



Reply to: effectiveness of acupuncture for tinnitus

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We read with great interest Dr. Wong-Kein Low and Dr. Wan-Ni Pok's editorial (1) regarding our review about the efficacy of acupuncture for tinnitus (2). We are grateful for the informative contribution aimed at clarifying several details on possible etiologies and pathomechanisms behind different types of tinnitus. Moreover, we fully agree with them in hypothetically considering the subgroup of patients affected by somatosensory tinnitus as the most potentially responsive target population of acupuncture-based physical treatments.

Despite “somatic testing” could represent an easily accessible way to assess the somatic modulation of tinnitus (3,4), it is not always easy to select a study population with purely somatosensory tinnitus, as tinnitus itself mostly represents a symptom of many illnesses so that several different pathomechanisms might coexist in the same patient.

On the other hand, available evidence basis allows to affirm that acupuncture might be effective for the treatment of neurogenic tinnitus (2). In fact, according to our umbrella review, while no definitive conclusions about the efficacy of acupuncture for tinnitus are outlined in the majority of analyzed systematic reviews and meta-analyses, neurogenic tinnitus seems to be the most responsive condition for the combination of acupuncture and moxibustion (5).

Let us try to explain how these apparently paradoxical pieces of evidence might be traced back to a common rationale.

From an audiological standpoint, different stages could

be detected in the origin of clinically relevant tinnitus. Whereas tinnitus-related neuronal activity is generated in the peripheral auditory system (particularly, in cochlear hair cells and in the 8th cranial nerve), the abnormal signal is driven through the brainstem and it is firstly detected by subcortical auditory centers, then it is perceived and evaluated in cortical auditory and non-auditory areas. Finally, the continuous, uncontrollable persistence of long-lasting tinnitus causes any tinnitus-related neuronal activity to become linked to a negative reaction in the brain, thus resulting in annoyance, anxiety and general stress. Due to this negative reaction, patients start to automatically direct more attention toward tinnitus and to enhance the detection of tinnitus signals by subcortical auditory centers. This condition stimulates the limbic and autonomic nervous systems, which, in turn, increase individual attention toward tinnitus itself, thus promoting the development of feedback loops that involve the auditory, limbic and autonomic nervous systems (6,7).

From a biological point of view, it is well known how acupuncture can activate both peripheral and central somatosensory systems. In fact, besides its modulating action on loco-regional immune system through irritative mechanical inputs resulting in micro-inflammatory stimuli, acupuncture has demonstrated to have an indirect action on central pathways, in particular on the somatosensory cortex (8,9).

In the light of the above, the reason why even tinnitus of non-somatosensory origin might benefit from acupuncture

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is easily understandable. Nevertheless, it is still not easy to quantitatively measure the efficacy of symptomatic treatments for tinnitus, as most outcomes actually rely on subjective inventory scales. Comparing benefits of acupuncture on tinnitus with the effectiveness of sham acupuncture on similar cohorts could represent a promising approach to assess a real effect of this therapy.

Therefore, despite the aforementioned difficulties in selecting patients with tinnitus caused by specific pathomechanisms, we would suggest to design a single clinical trial, possibly multicentric, enrolling either patients with tinnitus mainly due to myofascial disorders of the head and upper neck or patients in which a neurogenic etiology is highly plausible.

This could be a real starting point to potentially identify specific types of tinnitus characterized by a significant responsiveness to acupuncture-based treatments and it might also represent the first solid evidence of the efficacy of acupuncture in the treatment of some types of tinnitus.

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