

2009 Annual Evidence Update on Tinnitus: Expert Commentary

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Introduction

Research in tinnitus is gradually increasing our knowledge of different aspects of tinnitus. This commentary looks at a number of themes in the literature in 2008 relating to tinnitus. The articles chosen are personal choices of the author. Neither the sequence of the selected themes nor the articles have been selected on any order of merit. The articles have been selected from the extensive literature search undertaken by Steve Sharp, available with article abstracts in the [full annual evidence update report](#) of the 2008 tinnitus literature.

Silence and tinnitus

A common response, or indeed advice, for many people with tinnitus is to avoid silence. There were 3 interesting papers about silence and tinnitus. The first of these was an expanded version of the 1953 Heler and Bergman study demonstrating that tinnitus can be a common auditory reaction to silence. In the original study 80 students without hearing problems or tinnitus were put in a soundproof booth and asked to listen carefully, 93% of the participants reported tinnitus. In the Del et al study [1], 53 young adults with normal hearing were asked to select what sound they heard in an anechoic sound chamber. Eighty three percent of the participants reported that they experienced at least one sound. When they were placed in a chamber with a non-functioning loudspeaker, the percentage increased to 92%. In the paper by Knobel and Sanchez [2], the participants were given auditory attention, visual attention and cognitive attention tasks while sitting in a silent soundproof booth. In this silent environment, tinnitus was reported in all the groups with a greater perception of tinnitus in those who focused on their hearing. Westin et al [3] looked at how accepting the tinnitus might be a more helpful approach for managing tinnitus than suppressing it. Individuals with tinnitus, in a silent soundproof booth, were allocated acceptance or suppression strategies while focusing on a mental imagery task. Those in the acceptance group were able to focus on the task for a longer period before they felt the tinnitus intruded on the task.

Generation or modulation sites

There were a number of papers looking at sites in the brain where tinnitus might be generated or modulated. The role of the dorsal cochlear nucleus continues to be a prominent discussion point. Both Kaltenbach et al [4] and Tzounopoulos [5] discuss the related hypotheses. Lanting et al [6] used functional magnetic resonance imaging (fMRI) to visualise the effect of tinnitus and noted that there was an increased response to sound in the inferior colliculus in tinnitus patients compared with controls without tinnitus. The implications of non-auditory areas have also been explored in the past year. Lenhardt et al [7] looked at the possibility of the insula being implicated in the tinnitus pathway as well as the effect of multisensory vibration stimulation (somatosensory and high-frequency sound therapy) on the perception of tinnitus. Schlee et al [8], using whole-head magnetoencephalography, explored functional cortical involvement in patients with tinnitus.

Reactions to tinnitus

We know that the prevalence of people with non-troublesome tinnitus is far greater than that of those with troublesome tinnitus. This can relate to a number of factors. The commonest one is the attitude of the person to the tinnitus. This theme was a productive one in 2008. Davis et al [9] and Westin et al [10] both looked at how acceptance plays a significant role in the impact of tinnitus. Welch et al [11] explored the association of personality types with the level of tinnitus distress. An interesting study by Andersson et al [12] discussed an in-depth analysis of the feelings that patients with tinnitus had towards their tinnitus. Of course, we have to acknowledge that the feelings towards tinnitus are not always negative. Kentala et al [13] reported the results of a survey on the positive experiences that people associated with their tinnitus.

Relationship of anxiety and depression with tinnitus

The presence of depression and anxiety in patients with tinnitus, as a secondary effect of the tinnitus, or a co-existing or aggravating condition, is not a new concept. However, patients with tinnitus continue to be dismissed without these issues being explored. It is important, therefore, to keep the research in this area active in order to highlight the clinical need for these issues to be addressed. There was an interesting study by Heinecke et al [14] looking at the responses to physiological and psychological stresses in patients with chronic tinnitus. There are a number of questionnaires that are commonly used and that can provide an indication of these conditions. Adoga et al [15] in Nigerian study reported a 17.4% prevalence of depression and 22.8% of anxiety in patients with tinnitus when using the Hospital Anxiety and Depression Scale (HADS). Bartels et al [16] used the subsets of the HADS as well as the SF-36, Tinnitus Reaction Questionnaire, Tinnitus Handicap Inventory and Tinnitus Coping Style Questionnaire to further explore the additive effect of depression and anxiety on the quality of life in patients with tinnitus. Belli et al [17], using the Structured Clinical Interview for DSM-III-R, Beck Depression Inventory, Beck Anxiety Inventory, Symptom Check list-90 (Revised), also noted an increased prevalence of at least one psychiatric diagnosis in 70% of the patients. It was also interesting to see a study on the impact of tinnitus on the partners of those with tinnitus (Sturz [18]). While I have to admit my school German would not have been up to reading the article, the abstract suggests that the depression associated with the tinnitus does affect relationships and should be treated.

Tinnitus in young adults

Tinnitus in young people is often overlooked. So, it was nice to see this as the topic of two papers in 2008. A Swedish study [19] surveyed 15-16 year olds in mainstream schools. There was a higher rate of truancy, irritation and anxiety in those with tinnitus than those without, with a further increased rate in those with tinnitus and hearing problems. The authors suggested that students with a hearing loss and tinnitus be monitored to avoid subsequent problems. The abstract of a Polish survey of patients in a Tinnitus Clinic [20] reported a high proportion of young adults with tinnitus attending the clinic. A quarter of their patients were between 18 and 35.

Transcranial magnetic study

This continued to be a popular research and discussion theme in 2008 for both tinnitus and auditory hallucinations. The studies explored different aspects of transcranial magnetic stimulation (rTMS), looking at different patient groups, different stimulation sites, as well as modulating factors. The results of the studies looking at the effectiveness of rTMS were mixed. While the results of some studies suggest that rTMS might be a useful treatment for tinnitus [21-23], another did not find it to be of benefit [24]. Duration of tinnitus was noted to be a significant factor in the effectiveness of rTMS. Khedr et al [22] noted that the patients in their study who had tinnitus for the longest period of time were the least responsive to treatment.

Therapy

There were numbers of therapies discussed and assessed in 2008. Behavioural therapy continues to hold a prominent place. Kaldo et al [25] found that internet provision of cognitive behavioural therapy was as effective as the more standard group therapy. With the current shortage of cognitive behavioural therapist in the tinnitus field, this is a model worth considering. Biofeedback-based behavioural therapy was shown on a randomised controlled trial to be helpful and for the improvements to be sustained over the 6 month follow-up [26]. Neurofeedback therapy to manipulate cortical networks has also been reported to be helpful in reducing tinnitus loudness and distress. Schlee et al [27] reviewed their clinical studies using this approach. Still continuing the above acceptance theme, a mindfulness meditation cognitive behavioural therapy approach was found to be beneficial in reducing tinnitus distress [28]. Another psychology approach examined in 2008 was psychotherapy [29], although there was no increased benefit over selective serotonin reuptake inhibitor in this study.

Tinnitus management pathways and clinics

There were also a few papers in 2008 which might of interest to those setting up a tinnitus service. Tyler et al [30] provided a very clear approach to an audiologist-led tinnitus service. This paper is complimented by the overview of the model Newman et al [31] described and which they

use in their Tinnitus Management Clinic. As much of tinnitus management involves guiding the patient to a method they find effective in managing their tinnitus, it is always helpful to have clear and patient friendly self-help guides. It was a pleasure to read the final article in this commentary by Tyler et al [32] which is a useful guide in helping us to help patients help themselves.

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