P502

TINNITUS AND HYPERCUSIS
MANAGEMENT OF PULSATILE, RHYTHMIC AND SOMATO SENSORY TINNITUS

Tinnitus Intervention: Innovations, Trends and Strategies

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Abstract

Tinnitus evaluation, treatment, and research are continually evolving both inside and outside of audiology. This ePoster will provide a highlight of tinnitus literature published globally in 2023 with a focus on both clinical and research intervention specifically focusing on trends and innovations.

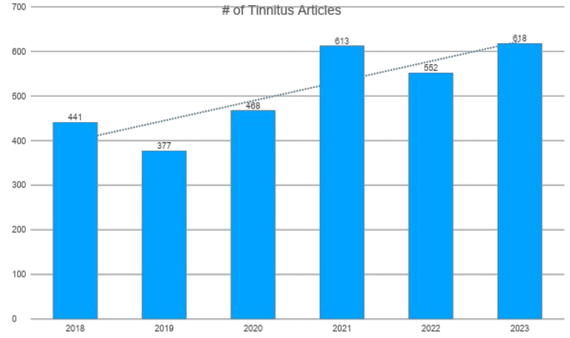
Objectives

To summarize key global trends and innovations in tinnitus literature published in 2023, with a focus on Measurements, Mechanisms, and Treatment.

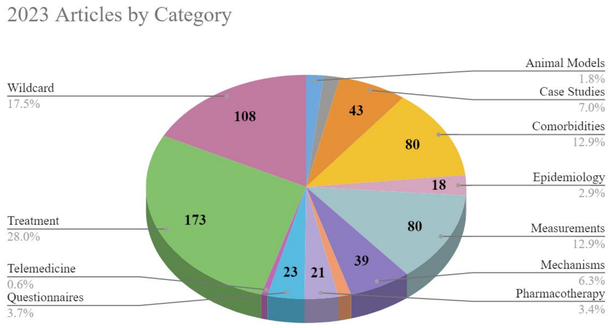
Methods and Materials

A literature review was completed to identify all tinnitus research articles published between January 1, 2023, and December 31, 2023. The terms 'tinnitus' and 'phantom perception' were utilized. As there are often many non-audiology disciplines that research and publish tinnitus-based studies that may have an impact in the field of audiology (e.g., otolaryngology, neurology, behavioral health, etc.), Google Scholar was employed to help locate articles in addition to the online databases for all major audiology journals. Following the article retrieval process, each publication was then assigned to a specific topic category based on title and/or abstract review. Authors used AI technology (ChatGPT) to assist with identifying key trends and innovations within each category. Manual cross-referencing of the AI-generated information was performed to ensure accuracy. As the authors have conducted this study annually since 2018, trends in publications were additionally compared and analyzed.

Results



As illustrated in the bar graph above, the number of articles published on the topic of tinnitus has reached its highest level (618 articles) since the authors began conducting this annual literature review six years ago.



This chart represents the various categories identified for the 2023 articles. The largest proportion (28%) of articles focused on treatments, followed by wildcard topics at 17.5%. "Wildcard" refers to unique topics that did not align with the other established categories.

Results Continued

Category	Trends	Innovations
Measurements	• Machine learning for diagnostics and analysis • Advanced electrophysiological and neuroimaging techniques (e.g., ABR, MRI) • Psychoacoustic assessments and auditory processing studies • Multimodal and cross-modal approaches • Biomarker identification and changes in cochlear pathways • Subjective and objective measurement techniques • Tinnitus-related distress and cognitive impacts • Refined diagnostic methods • Experimental models and theoretical frameworks	• Research examines parallels with chronic pain, cognitive disruptions, and the impact on executive functions. • Cutting-edge strategies, such as targeting the M1 receptor and limbic system, are advancing treatment development.
Mechanisms	• Neuroimaging is used to identify biomarkers in brain regions like the anterior cingulate cortex. • Neurophysiological studies examine sensory processing disruptions. • Molecular and genetic factors, including neuroimmune and endocannabinoid systems, are being investigated for their roles in tinnitus. • Comparative models differentiate noise- versus salicylate-induced tinnitus. • Cognitive aspects explore links to chronic pain and dysfunction. • Autophagy and cellular mechanisms, along with advanced computational methods, offer deeper insights. • Research aims to identify therapeutic targets for more effective interventions.	• Advanced neuroimaging techniques like fMRI are used to study brain connectivity. • Neurophysiological studies use tools like dynamic structural equation modeling to explore individual variations. • Genetic research links tinnitus to synaptic proteins through Mendelian randomization. • The endocannabinoid system is investigated as a therapeutic target. • Experimental models, such as salicylate administration, enhance understanding of tinnitus mechanisms.
Treatment	• Traditional therapies are now enhanced by digital tools such as mobile apps. • Emerging multimodal approaches combine sound therapy with cognitive and neuromodulation techniques. • Acoustic therapies, including sound amplification, are evolving alongside methods like rTMS and tDCS. • Clinical studies emphasize treatment effectiveness, patient acceptance, and psychological impacts. • Complementary methods like acupuncture and herbal treatments are being explored. • Research continues to advance through systematic reviews and new protocols.	• Neurofeedback, CBT, personalized music therapy, and digital solutions like smartphone-based and internet-delivered therapies. • Advanced techniques combine acoustic and theta burst stimulation, with multimodal approaches delivered via web platforms. • High-definition pink noise and neuromodulation methods are under investigation. • Research focuses on patient education and therapy acceptance. • Complementary approaches like acupuncture are being studied alongside novel methods such as pulsed radiofrequency. • Comprehensive reviews highlight a shift toward integrated, high-tech, patient-centered treatments.

*Due to poster spacing limitations, presented results were limited to the top 3 categories authors felt would be of most interest to conference attendees.

Conclusion

In 2023, tinnitus research has significantly advanced with innovative approaches in diagnostics, mechanisms, and treatment. Key trends include the integration of machine learning and advanced neuroimaging for improved measurement, the exploration of neurophysiological and genetic factors for understanding mechanisms, and the development of multimodal, digital, and patient-centered therapies for treatment. These advancements highlight a growing emphasis on precision and personalization in tinnitus management.

References

- OpenAI. (2024). ChatGPT. https://chatgpt.com/
- Scan the QR Code to Access Our Spreadsheet Containing Every Tinnitus Article Published in 2023

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