







Original Article

Tinnitus Perspectives among Israeli Ear, Nose and Throat Physicians: A Nationwide Survey

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OBJECTIVES: To study the compliance of ear, nose, and throat (ENT) physicians to the American Association Otolaryngology-Head & Neck Surgery (AAO-HNS) clinical practice guidelines (CPG) for tinnitus and to identify the disparity of both diagnosis and management options in the absence of a local protocol for the management of adult tinnitus.

MATERIALS and METHODS: A voluntary and anonymous questionnaire was emailed in a Google spread-out sheet format to all practicing ENT physicians across the country (n=370). Overall, 126 ENT physicians responded to the questionnaire (34% of the physicians to whom the questionnaire was sent).

RESULTS: Medical history focuses on tinnitus characteristics and otological signs, and symptoms are often queried (80%-98%). Physicians routinely perform an otoscopic examination, whereas other relevant possible physical findings, such as temporomandibular joint disorders or neck trauma, are less frequently examined. Treating physicians have the most frequent recourse to sound therapy and cognitive behavioral therapy in accordance with AAO-HNS CPG.

CONCLUSION: The publication of the AAO-HNS CPG for tinnitus is important, permitting a common approach for the diagnosis and management of primary tinnitus (PT). A diagnosis and management scheme that takes into consideration both the AAO-HNS CPG for tinnitus as well as physician diagnosis and management paradigms is suggested.

KEYWORDS: Tinnitus, hearing loss, surveys and questionnaires, guideline

INTRODUCTION

Subjective tinnitus is an auditory perception, wherein patients perceive "ringing, hissing or sizzling in the ear(s)," in the absence of a corresponding objective external stimulus. Idiopathic tinnitus, with or without concomitant hearing loss, can be described as primary tinnitus (PT) ^[1]. PT may have an abrupt or insidious onset, can be unilateral or bilateral with a varying intensity, and is experienced either constantly or intermittently ^[2]. PT is a frequent complaint both in the general practitioner's clinic and in the ear, nose and throat (ENT) clinic, and it is experienced by up to 30% of the population in different regions in the world ^[1-6]. Some patients experiencing PT may not be bothered by it at all, while others (1%-5%) may be severely affected, presenting symptoms ranging from mild anxiety and depression to suicidal thoughts, sleep disturbances, and inability to perform daily tasks ^[7]. The work-up of the auditory system includes otoscopy, tuning forks, and complete neurological examination, and most patients are referred to ancillary tests, such as audiometric evaluation, auditory brainstem response (ABR) test, and possibly magnetic resonance imaging (MRI) study or computed tomographic (CT) scan of the temporal bone ^[7,8]. Treatment options range from cognitive behavioral therapies to medical therapies ^[9-12]. Surgical interventions, such as cochlear neurectomy, are rarely offered ^[13]. In patients with chronic

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Table 1. Questionnaire

Setting and Physician Impressions (Q1-2)
1. In which setting do you practice?
A: Hospital, clinic, both
2. Burden of Disease
A: No. of patients with tinnitus seen per year: 0-20, 21-40, 41-60, >60
Medical History (Q3)
Laterality of the tinnitus
Tinnitus characteristics
New onset/prior hearing loss
Prior or present noise exposure
Concomitant vertigo
Concomitant medical treatment
Prior head trauma
What made the tinnitus appear?
Concomitant depression or anxiety
Prior neck trauma
Presence of temporomandibular joint (TMJ) disorders
Physical Examination (Q4)
Otoscope examination
Neck palpation
Tuning forks test
Oral cavity and TMJ examination
Auscultation (ears, neck)
Neck muscular tension
Blood pressure and heart beat registration
Ancillary tests (Q5)
Audiometry
Magnetic resonance imaging
Tympanometry
Auditory brainstem response test
Blood tests
Psychoacoustic testing CT scan
SPECT
Guidelines acquaintance (Q6)
Are you acquainted with the clinical guidelines for the treatment of tinnitus as published by the American Academy of Otolaryngology-Head and Neck Surgery in 2014?
A: Yes/No
Treatment (Q8) Refer to Figure 2
Patients referral (Q9-10)
Do you refer patients with tinnitus to other medical disciplines?
A: Yes/No

Do you refer patients to a designated tinnitus clinic?
A: Yes/No
Who should head such a clinic?
A: ENT physician, mental health professional, neurologist
Physician-Patient Relationship (Q11-13)
Do you feel inapt or frustrated while treating patients with tinnitus?
A: Yes/ No
What is the percentage of patients with tinnitus that aggravate their complaints?
A: 25%,50%,75%,100%
Do you think that there should be an accessible, well-formulated internet site to answer the queries of these patients?
A: Yes/ No

bothersome PT, referral to a specialized tinnitus clinic may be beneficial, thereby enabling a multidisciplinary approach to this complex problem.

The heterogeneity of PT reported by patients hinders research on both diagnosis as well as treatment paradigms. Presently, there is neither uniformity nor consensus on PT diagnosis or management between healthcare professionals who treat these patients, thereby leading to inappropriate use of medical resources and treatments, which may entail an unnecessary economic burden as well as possible deleterious effects for patients. In the United States, the estimated costs of tinnitus work-up and treatment are mounting, and the annual cost of tinnitus-related claims is estimated to exceed \$2.75 billion by 2016 [2]. A protocol that will assist in the work-up and management of PT may assist in the diagnosis and management of PT.

In the absence of a standard protocol for the management of PT in adults in the country, we sought to study the compliance of ENT physicians to the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) recent clinical practice guidelines (CPG) for PT. Furthermore, we identified gaps between these guidelines and common practices of noting history, performing physical examination, utilizing ancillary tests, referring to specialized clinics, and providing treatment options.

MATERIALS and METHODS

The survey was conducted in compliance with the ethical principles of the assigned institutional board (informed consent forms were not required). We composed a voluntary multiple-choice questionnaire comprising 13 items, which included demographic data of the responder, and key questions regarding tinnitus history, physical examination, diagnosis, and treatment (Table 1). The questionnaire was emailed in a Google spread-out sheet format to all practicing ENT physicians across the country by the electronic services of the National Medical Association (n=370). Responders remained anonymous. The survey was conducted during March-May 2016.

Table 2. Tinnitus Characteristics

Medical History Item	No. of responders (percentage)
Laterality of tinnitus	122 (98%)
Tinnitus characteristics	121 (97%)
New onset/prior hearing loss	121 (97%)
Prior or present noise exposure	118 (94%)
Concomitant vertigo	110 (88%)
Concomitant medical treatment	100 (80%)
Prior head trauma	89 (71%)
What made the tinnitus appear?	85 (68%)
Concomitant depression or anxiety	79 (63%)
Prior neck trauma	58 (46%)
Presence of TMJ disorders	47 (37%)

TMJ: Temporomandibular Joint

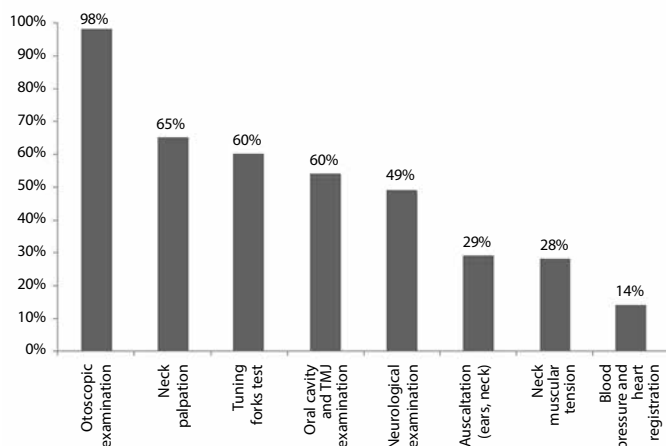


Figure 1. Physical examination (n=126).

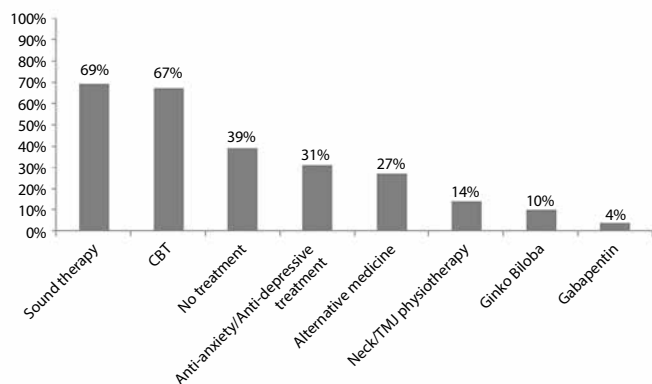


Figure 2. Treatment options in a patient with long-standing PT, without any concomitant audiological or psychiatric conditions.

Eligible responders were practicing ENT physicians in all stages of their career [residents (n=93) and attending physicians (n=277)] who worked in clinics and/or in hospitals. Retired ENT physicians were intentionally excluded from this study owing to the expected difficulty

in reaching them through the email system. In total, 126 (34%) physicians responded.

All the questionnaires were analyzed and questions were grouped according to the following categories: setting in which the physician practices; medical history attained; physical examination performed; ancillary testing; proposed treatment and consultations; and physician-patient rapport.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) software version 22 was used for all statistical analysis (IBM Corp.; Armonk, NY, USA).

RESULTS

Setting

Most physicians work both in the hospital as well as outpatient setting (n=63, 50%). The remaining respondents work either in a hospital or in an outpatient clinic (n=39, 30% and n=25, 20% respectively). Annually, most physicians (n=77, 61%) encounter more than 40 patients presenting with PT symptoms. There were no substantial differences between physicians working in the hospital setting and those working in outpatient clinic regarding examinations and treatments for tinnitus.

Medical History

Table 2 shows the common questions asked during noting history. Only 20% of physicians (n=25) inquire about concomitant medical treatment, which may be one of the causes of tinnitus. Prior head and neck trauma is seldom questioned, although it is known to be a frequent inciting factor for tinnitus.

Physical Examination

Figure 1 demonstrates the physical examinations performed in patients with PT. An otoscopic examination is routinely performed, whereas tuning forks test is performed by only 60% (n=76). Neck palpation is performed by 65% (n=83), and temporomandibular joint (TMJ) palpation is less frequently performed (n=68, 54%), even though TMJ disorder is a frequent comorbidity in tinnitus.

Ancillary Tests

Most physicians refer patients to perform ancillary tests. These include audiometric evaluation (n=126, 99%), head MRI studies (n=78, 62%), tympanometry (n=67, 54%), ABR (n=55, 43%), complete blood work-up (including thyroid stimulating hormone and vitamin B12 levels) (n=33, 26%), psychoacoustic testing (e.g.: tinnitus pitch and loudness matching tests) (n=23, 18%), temporal bone CT scan (n=13, 10%), and single positron emission tomography (SPECT) (n=3,2%).

Treatment

Almost half of the respondents (n=54, 45%) were acquainted with the 2014 AAO-HNS CPG for tinnitus (1).

To study the treatment trends, respondents were presented with a theoretical patient who presented with long-standing PT, without

Table 3. Compliance with AAO-HNS CPG for Tinnitus

	AAO-HNS recommendation	Compliance to guidelines in our survey
Perform a targeted history and physical examination	Recommendation	Mostly compliant (see Table 1, 2 and Figure 1)
Prompt audiologic examination	Recommendation: when tinnitus that is unilateral, persistent (≥6 months), or associated with hearing difficulties.	99%
Routine audiological examination	Option	99%
Imaging studies	Strong recommendation against: unless tinnitus that localizes to 1 ear, pulsatile tinnitus, focal neurological abnormalities, or asymmetric hearing loss	38%
Education and counseling	Recommendation	Not directly assessed, 91% of physicians stated that there is need for improvement
Sound therapy	Option	69%
Cognitive behavioral therapy	Recommendation	67%
Medical therapy	Recommendation against	69%
Dietary supplements	Recommendation against	90%
Acupuncture	No Recommendation	27%

any concomitant audiological or psychiatric conditions (Figure 2). Most physicians preferred sound therapy and cognitive behavioral therapy (CBT) over other forms of therapy. Complementary and alternative medicine (CAM) was chosen as a treatment option by 27% of physicians, whereas Gingko Biloba and Gabapentin were rarely used (4%-10%).

Patients Referral

Fifty-five (43%) respondents would refer patients with tinnitus to other medical specialties (e.g., neurology, psychiatry, and psychological treatment), whereas the remaining 69 (54%) deferred that option. Most respondents would refer their patients to a designated tinnitus clinic (n=89, 72%), wherein different aspects of PT are diagnosed and managed.

Physician-Patient Rapport

When questioned regarding the physician’s rapport with patients with PT, most respondents felt inapt and frustrated while treating them (n=85, 67%). On the other hand, most respondents were under the impression that the majority of patients were not aggravators (n=123, 97%).

The majority of the respondents stated that there should be an accessible, well-formulated website to answer common queries of both patients and physicians in order to improve patient care (n=118, 91%).

DISCUSSION

The American Academy of Otolaryngology-Head and Neck Surgery recognized the lacuna that was sensed among ENT physicians regarding the diagnosis and management strategies of PT and consequently published its CPG for PT in 2014 [1]. These guidelines define the standard-of-care for patients with PT in the United States, thereby allowing for quality improvement in the evaluation and treatment

of PT. To our knowledge, this is the first study investigating the diagnosis and management strategies for PT after the CPG publication. A recent study, published by Blakley in 2016, compared treatment approaches used by otologists before and after the publication of CPG tinnitus guidelines [14]. We sought to broaden this inquiry to include diagnosis and management approaches to this common problem. We have found that even though disparity exists between ENT physicians, a general trend of adherence to the CPG tinnitus guidelines can be seen (Table 3).

Previous studies have shown the importance of acquiring information regarding risk factors linked to PT, such as noise exposure and the use of concomitant medical treatment (e.g., loop diuretics and aspirin), which have an odds ratio of 1.5–2 with PT [15, 16]. As shown in the present study, these factors are routinely assessed by most physicians, possibly because they are an integral part of medical history taking in many ENT domains. Prior head and neck trauma, which may be associated with an odds ratio of 1.84 with PT, [16] was less frequently questioned. This may be because of the underestimated association between trauma and tinnitus. Other studies have focused on comorbidities, such as TMJ and depression, also known to be frequently seen in patients with PT [17, 18]. We found that ENT physicians inquire less frequently regarding these treatable medical conditions. We assume that TMJ disorders are less frequently treated by ENTs as are psychiatric disorders.

We found that otoscopic examination is the basic examination performed by the majority of ENT physicians (98%), although, interestingly, the tuning forks test is less frequently performed (60%). It is perhaps because the majority of patients with tinnitus are sent to perform an audiometric evaluation (99%) [16]. Previous studies have shown an increased likelihood of hearing loss in patients with tinnitus (odds ratio, 3.2-4.5) [2, 3, 16]. The AAO-HNS tinnitus CPG recommended a prompt audiometric evaluation to be performed

for patients with PT when tinnitus that is unilateral, persistent (≥ 6 months), or associated with hearing difficulties. Yet, the authors further stated, as an option, to perform an audiometric evaluation in all patients with PT, regardless of laterality, duration, or perceived hearing status. In real life, the latter option was adopted by most clinicians because otoscopy and tuning forks tests cannot detect mild hearing loss.

We observed that 62% of physicians performed an MRI examination for patients with PT. According to the AAO-HNS CPG, this examination should be reserved for patients presenting with one or more of the following: tinnitus that localizes to one ear, pulsatile tinnitus, focal neurological abnormalities, or asymmetric hearing loss^[1]. The modest use of this test should be emphasized due to the limited availability and its high cost. Other ancillary tests, such as ABR, complete blood work-up, and tinnitus pitch and loudness matching tests, were found to be unnecessary, and do not contribute to the diagnosis or management in PT. This observation is consistent with the AAO-HNS CPG.

The present study demonstrated that sound therapy and CBT are the two most frequent methods that are chosen by ENT physicians, in accordance with the AAO-HNS CPG recommendations. In other areas, such as drug therapies, 31% of physicians stated that they prescribe anti-depressive or anxiolytic therapy, although there is no study indicating a clear benefit from these medications and all entail the possible side effects. The same can be said regarding treatment using Gingko Biloba and Gabapentin, both of which are not recommended and are rarely used by physicians.

The use of CAM, particularly acupuncture, was discussed in the AAO-HNS CPG, but no specific recommendation was provided, owing to poor evidence of efficacy and the low potential for harm. In the present survey, approximately one-third physicians opted for the use of CAM possibility. This may be a consequence of the perception of the relatively benign nature of these treatments. Further rigorous studies are warranted in order provide information regarding the potential benefit of alternative therapy and in particular acupuncture for patients with PT.

Tinnitus is a common disorder that can involve a time-consuming workup, which is both costly and mostly ineffective, and treatments which are unproven and sometimes even harmful. To decrease unnecessary expenditure and secondary effects of unproven treatments, we propose a simple schematic approach to tinnitus for clinicians who infrequently deal with this entity. The diagnosis and management scheme (Appendix 1), which takes into consideration both the AAO-HNS CPG for tinnitus as well as physician diagnosis and management paradigms, as demonstrated in this survey, may be such an instrument.

CONCLUSION

The publication of the AAO-HNS CPG for tinnitus is important, which will permit a common approach for the diagnosis and management of PT. The physicians who participated in this survey generally adhered to these guidelines. A structured schema is

suggested, and it may provide the clinicians with a practical and easy to use tool, thereby leading to a more efficient work-up and realistic treatment expectations for patients with bothersome PT.

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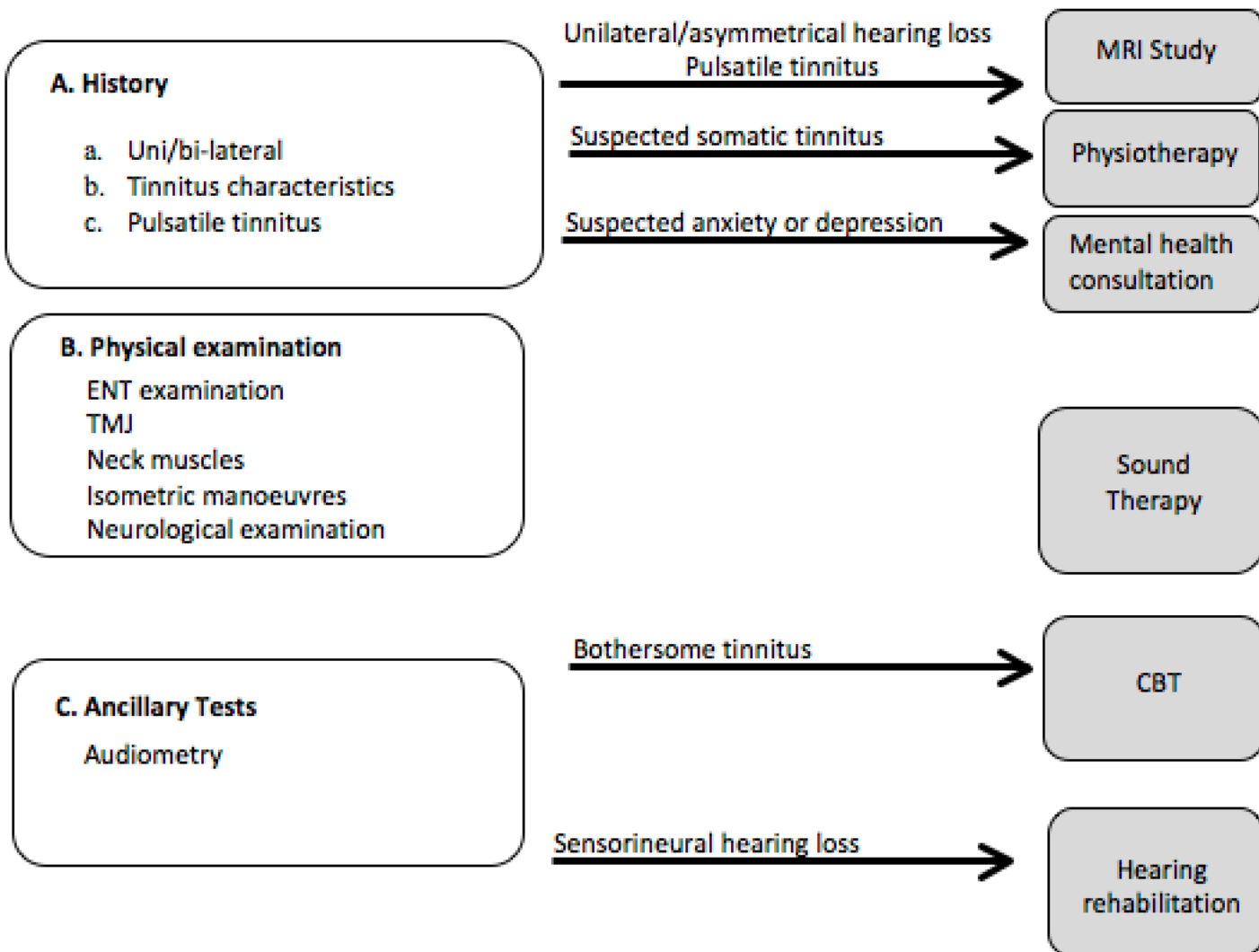
You can reach the appendix of this article at <https://doi.org/10.5152/iao.2018.5627>.

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Appendix 1. Tinnitus Diagnosis and Management Schema



ENT: ear, nose and throat; TMJ: temporomandibular joint; MRI: magnetic resonance imaging; CBT: cognitive behavioral treatment