BIAP Recommendation 29/1:

Tinnitus and Hyperacusis – diagnostic procedures

Foreword

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Introduction

In the industrialised European countries ~ 20% of the population report to have a tinnitus occasionally, ~ 4% seek further diagnostics and 1-2% are affected by their tinnitus and/or hyperacusis to such an extend that it has such a severe effect on their quality of life so that a treatment is required.

The causes of tinnitus and hyperacusis are various and the real etiopathology in most cases is still unknown. So the diagnostic procedures, which are the focus of this recommendation, must be quite broad to cover all possible causes and demand quite often a multidisciplinary approach. Therapeutic procedures and their multidisciplinary aspects will be dealt with in a second recommendation.

Recommendation

1. Definition and Classification

The term "Tinnitus" covers all abnormal sounds in the ear in the absence of an external sound sources. Only in a few cases these sounds are also audible by an examiner.

Tinnitus can be classified by its origin (a), its timely progression (b) and by its effects on the patients (c).

a. Objective Tinnitus, which has an physical sound source inside the patient`s body (like a blood vessel) and subjective Tinnitus, which originates in false information processing in the auditory pathways without the existence of a physical sound source.

b. Acute Tinnitus exists less than 3 months, subacute tinnitus exists between 3 - 12 months and chronical tinnitus exists more than 12 months.

c. Compensated Tinnitus is noticed by the patient but without or only with minor effects on his quality of life. The patient can cope with the tinnitus.

Decompensated Tinnitus has a major effect on the life quality of the patient. The patient develops secondary mostly psychosomatic symptoms. The patient cannot cope with the tinnitus without external help.

Hyperacusis is used here in a broader sense of any oversensitivity to sounds and noises that affects the patients well being.

2. Diagnostic Procedures

Tinnitus and Hyperacusis are symptoms based on various causes. Tinnitus of otogenic causes is often intensified by other functional and/or psychological factors. All possible causes have to be individually diagnosed or ruled out, as the results of the examinations are the necessary basis for counselling and eventual treatment. Quite often the doctor`s explanations and the reassuring test results will overcome the patients fearful attitude. This may lead to an acceptance of the tinnitus without any further therapy.

Considering the economically feasible and medical necessities, the diagnosic procedures should not be done using a strict schedule for each patient, but to be adapted to the individual case. Often the procedure will leads to the identification of a hearing loss.

3. Case history

A thorough case history presents the basis by which a sequence of relevant diagnostic procedures are identified. It also allows an evaluation of the level of severity and annoyance as well as secondary symptoms. It must be stressed that the examiner allocates enough time for the anamnesis (for most tinnitus/hyperacusis patients 30 minutes must be regarded as a minimum). The use of a questionnaire before or after the interview or as a guideline for the examiner during the interview might be helpful but can never substitute or cut short the amount of time allocated to the personal exchange.

During the interview the following topics are especially relevant:

- tinnitus/hyperacusis persistence (development over time)
- external influences on the tinnitus/hyperacusis
- additional diseases / medical problems beside or connected to the tinnitus/hyperacusis
- physical and psychological effects on the well being of the patient

4. Necessary diagnostic procedures (which should be done at least once)

- ENT-evaluation including tympanomicroscopy and nasopharyngoscopy
- function of the eustachian tube
- auscultation of the a. carotis, cranial arteries and at the entrance of the ear canal when tinnitus is pulse synchronic
- pure tone audiometry (AC and BC), speech audiometry
- loudness discomfort level (LDL)
- evaluation of the tinnitus loudness with narrow band noise and evaluation of the frequency characteristic by pure tones

- evaluation of the minimal masking level with broadband and narrow band noise
- tympanometry and stapedius reflex measurement including monitoring of possible breathing- or pulse synchronic changes.
- OAE (Otoacoustic Emissions)
- BERA (Brainstem Evoked Response Audiometry)
- test of the vestibular function including caloric testing
- manual examination of the neck, searching for functional disorders
- dental and maxillary inspection
- evaluation of the tinnitus/hyperacusis severity as well as possible secondary symptoms, by the quantitative evaluation of the level of annoyance using a
- standardised questionnaire or structured interview possibly in combination with visual digital or analogue scales. (They can be also used to monitor the treatment progress.)
- All test methods which use high loudness levels (impedance audiometry, BERA, speech audiometry) should be performed with precaution because of the danger of further damaging the inner ear.

5. Useful in special cases

After analysing the results of the case history and the basic diagnostic evaluation further and/or psychological diagnostic procedures might be necessary:

1. medical examinations like:

   A gnathogical evaluation (when jaw disorders are existing), a sonography of brain supplying arteries, an angiography of cerebralvascular system, high resolution computer tomography of the petrosus bones, MRI of the brain and the auditory pathways, internal medical examination;

   laboratory testing for: neurotropic bacteria or viruses, immune system disorders, metabolic disorders, blood cell disorders

2. psychological evaluation:

   A psychological evaluation should be considered, if the answers to the questions ”Is tinnitus annoying?” or ”Is tinnitus during the day enervating and always present?” are positive. (It is not recommended, if the patient is hardly aware of the tinnitus during the day or only aware of it in silence and if the level of annoyance is small). The psychological assessment is crucial to diagnose accompanying disorders of decompensated chronic tinnitus. This assessment should take into account especially the patient`s actual disorders which are directly related to tinnitus, seldom resulting into psychoanalysis. The psychological evaluation should be made by a psychologist trained in tinnitus diagnosis and therapy. In individual single cases this diagnosis may lead to a psychotherapeutical approach.

References

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Royal National Institute for Deaf People (RNID) factsheet, Statistics on deafness; RNID Helpline, PO Box 16464, London EC1Y 8TT

This recommendation was created and approved in multidisciplinary cooperation between professionals of all audiophonologic disciplines, which are medicine, pedagogy, speech therapy, psychology and hearing instrument audiology.

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