Обзоры

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Tinnitus (Шум в ушах)

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Definition and Epidemiology

Tinnitus is defined as a subjective perception of a noise when there is a failing of a sound source [59] and dysfunction in hearing system is a cause. Tinnitus appears usually with hearing disturbances but it can also be a single symptom. Causes of Tinnitus genesis can versatile - noise, ototoxic substances, aging, stress, inflammation and bleeding disorders can be among them. Because of being heterogeneous and concerning its consequences Tinnitus can itself be shown as a symptom, not an illness.

Epidemiological researches indicate 5-15% prevalence of Tinnitus [1] . Prevalence exchanges with the suffering, app. 6% among mild and moderate Tinnitus suffering and 4% among heavy Tinnitus [41].

Clinical Classification

- *Acute vs. Chronic*

Tinnitus is indicated as acute when it ranges till 3 months. Therefore the acute therapeutic treatments are appropriate only during this time. When tinnitus continues more than 3 months it turns into chronic. And the change-

over is fluent. Division into 2 time flows is optimal from the therapeutic side. It's important to say that during long lasting chronic tinnitus there can be periods of it being louder or stronger (more noise, higher suffering). This exarbation can not be compared with acute tinnitus. It is more up to feeling phenomenon, which can change through stress reactions.

- *Objective vs. Subjective*

Objective tinnitus is coming from body and can normally be felt both by a patient and explorer (for example spasm of tensor tympani muscle, vascular changes, arterio-venous fistule). Subjective tinnitus is felt only by patient himself is more like a pantom feeling.

- *Tinnitus severity*

The heaviness of tinnitus in chronic stage shows necessity of therapeutic intervention. The decision depends on whether it is a compensated or decompensated tinnitus. The suffering degree allows to establish clinical anamnesis including psychosomatical aspects from one side and with the help of using valid questionnaires from the other side. (see psychosomatic diagnosis section).

Compensated (without secondary symptomatic)

The patient records (indexes) the ear noise, it also can be without secondary symptom.

I Grade - no painful pressure

II Grade - more in the silence, bothers during stress and load

Decompensated (with secondary symptomatic)

III Grade - when tinnitus makes negative influence in private and professional life. There is secondary symptomatic in emotional, cognitive and physical spheres.

VI Grade - tinnitus brought to complete negative influence in private and professional life.

- *Hearing Loss*

Tinnitus is often associated with high frequented, sensorineural hearing loss. Over 80% of Tinnitus patients suffer also from hearing loss, most of them have also hyperacusis (sensitiveness against loudness). Most of the ear sounds appear to be in high frequency level and impress as a high whistle, almost always they match with concurrently appeared high frequensed hearing loss [7,22,38,39,54,66]. Degree of hearing loss is in connection with accompanying

things such as sleeping disorders, loss of concentration, tinnitus severity degree is a crucial predictor of experienced impairment [9].

- *Localisation and Frequency*

Tinnitus can be felt from one side, both sides or in head. It can include different tones and noise variations [38,39] as for example whistle, noise, buzz, hissing (sizzle), ringing, beeping, whizz, hum, chirp, pulsation, hammer.

1.2. Therapie of chronic tinnitus

At the moment there aren't any causal healing methods for chronical stage of tinnitus found.

Suffering from tinnitus is individual and is not correlated with the frequency of tinnitus or with the loudness [13] . The major differences in suffering from tinnitus are the characteristics of the accompanying symptoms and diseases as for example depressions, sleeping and concentration disorders ets. explainable [34].

Therapeutic approaches above all aim currently support in working and coping processes such as stress management strategies and treatment of comorbid symptoms [18]. In the focus is re-evaluation of tinnitus as a symptom. Psychosocial factors as well as coping mechanisms or even chronic stress should be determined. An important point is the development of for example structure of self-perceptive abilities, e.g. the strengthening of health-related awareness. Various international relaxation techniques and body-related procedures are used.

In principle, avoidance behavior, e.g. search for silence in the sense of shielding ambient noises is not recommended to patients suffering from tinnitus.

1.2.1. Counseling

The aim of the counseling is to provide a clarifying psycho-educative explanation. In addition, the classification of tinnitus as a benign symptom is discussed and possibilities for therapy are shown. Thus counseling is the basis for constructive habituation mechanisms and leads to the avoidance of negative disease models. The evidence level is moderate [24,25].

1.2.2. Tinnitus retraining therapy (TRT)

The TRT is a special combination of counseling and auditory stimulation by maskers or hearing aids [31]. In the German-speaking world, psychological aspects are integrated into the TRT.

Even if the TRT has been carried out worldwide for 25 years and is described in many studies [4,29], there is no evidence for the very different and sometimes incomparable approaches. Therefore, the clinical effectiveness of the TRT is not clearly demonstrated by Cochrane meta-analysis [50].

1.2.3. Behavioral therapy approaches

1.2.3.1. Cognitive Behavioral Therapy

At the moment, CBT has demonstrated its efficacy in the treatment of chronic tinnitus with high evidence. The aim of a CBT is to raise awareness and change maladaptive patterns on cognitive, emotional and behavioural levels.

A Cochrane meta-analysis (8 studies, n = 468) showed a significant improvement in quality of life and tinnitus, as well as the degree of depression. Tinnitus was not affected [42].

1.2.3.2. Multimodal Therapies

Step-by-step multimodal CBT oriented therapy programs (including counseling, CBT and auditory stimulation) also show a positive influence on the quality of life, tinnitus severity and obstruction by the ear noise [10,43-46]. Other multimodal therapeutic approaches, including counseling with information mediation and detailed psychosocial and ENT diagnostics, CBT, hearing training, relaxation and body-related procedures, show a sustained, consistent reduction in tinnitus over a period of 3 years and 5 years. Even stationary multimodal psychosomatic therapies show good intervention effects [22].

The psychological models underlying the therapy of tinnitus can be divided into two main approaches: cognitive (behaviour-oriented) approaches and psychosomatic complex approaches:

Cognitive approaches

Jastreboff's neurophysiological model *Main hypothesis:*
Dysfunctionality with respect to two strategies:
- recognition, filtering
- perception, assessment

Based on two fundamental principles of neuronal organization:
1) Plasticity
2) Habituation

Hallam's habituation model *Main hypothesis:*
Dysfunctions in the attention system prevent

habituation.

McKenna's cognitive model *Main hypothesis:*
Cognitive fixation on the tinnitus signal and altered selective attention
the tinnitus perception

Cognitive Behavioral Therapy (CBT)

Anxiety avoidance model *Main hypothesis:*
Avoidance behavior and short-term reinforcement
(E.g., anxiety solution)
Tinnitus medium to long term (maintenance based fears).

Multimodal psychosomatic therapy:

Dysregulation model Main hypothesis:
Associated with tinnitus perception affects and stress leads to catastrophic tendency and increased stress relief through tinnitus

1.2.4. Hearing Therapeutic Intervention

1.2.4.1. Sound therapy

A Cochrane review on sound therapy (6 studies, n = 553) showed poor quality of the studies and great methodological heterogeneity, so that a planned meta-analysis was not feasible [28]. The therapy showed no significant change in tinnitus loudness and in the suffering degree. Possibly a sound therapy can be used as accompanying therapy. At the moment, however, it is unclear whether complete or partial masking is more effective with regard to a long-term effect. In summary, the effectiveness can neither be demonstrated nor disproved [28].

1.2.4.2. Hearing aids

Hearing aids lead to the improvement of the hearing loss and the quality of life. This makes the decision on hearing aids for the sole tinnitus therapy very complicated [28]. Only few randomized, controlled cases examined hearing aids as primary intervention in tinnitus [24,27,57,58]. Currently, however, there is agreement that hearing aid as a primary intervention in case of co-existing hearing loss also contributes to the tinnitus habituation and thus the early hearing aid supply is also indicated for tinnitus in the case of hearing loss [63].

The use of hearing aids at low and medium tinnitus frequencies (up to 6 kHZ) may be higher than in high-frequency tinnitus [47]. A few studies show that an early hearing aid contributes to the maintenance and strengthening of cognitive function, as well as to the reduction of distress and tinnitus, until the reduction of dementia [40].

1.2.4.3. Hearing training

The aim of the hearing training is to practice the skills of the central hearing processing such as directional listening, focusing, differentiation in the noise with and without hearing aid. This can be used to ensure an improvement in the over-hearing of tinnitus [23,51,55]. Despite some studies [19-21,26], the overall evidence level is weak.

1.2.4.4. Cochlear Implant

After cochlear implantation with appropriate indication (deafness, one-sided or bilateral), tinnitus (homolateral, contralateral and bilateral) is often shown to be improved (CI-based single-implantation studies [48,49,52], A metaanalysis (9 studien, N = 36) showed a significant tinnitus reduction, improved speech comprehension and spatial hearing [8].

1.2.5. Pharmacological intervention

Both the German and the American guideline clearly state that at present no drug has demonstrated efficacy in chronic tinnitus [36].

2. Complications

2.1. Decompensation

Particularly in the presence of pronounced tinnitus (chronicly compensated with severity III and IV to Biesinger), the symptom tinnitus dominates the affected person increasingly, dominates his ability to live and create and constrains this more and more [14,22,38,39]. From the increasing fixation to the ear noise, further comorbidities such as sleep and concentration disorders develop, depressive symptoms, anxiety, hearing impairments such as hyperacusis, dysfunctional coping strategies (for example, avoiding rest and relaxation) and distress symptoms with stress-associated somatic symptoms. In regard to the complexity of tinnitus and the frequent involvement of psychological factors, especially in this case a comprehensive and differentiated diagnosis seems to be indispensable, which should contain, in addition to audiological measurements, the investigation of relevant psychometric parameters [9,59]. The inclusion of psychometric procedures in tinnitus

diagnostics is of great importance in the context of a more individualized and adequate counseling and treatment. On one hand, it can contribute to the cause of the disease, on the other hand it can also be used to identify and analyse existing psychological comorbidities and psychosocial influencing factors in the habituation process. 0.5% of the adults are significantly restricted in their quality of life (decompensated complex tinnitus disorders) by the ear noise. The focus is on:

- Fixation to acoustic phenomenon Tinnitus,
- Lack of concentration, nervousness,
- Psychomotor restlessness up to sleep disturbances,
- Depressive developments to the endangerment of workability and suicidal behaviour

2.2. Hyperacusis

Tinnitus is often accompanied by other auditory phenomena. Under other abnormal hearing impairments' is especially understood the 'hyperacusis', which is characterized by the fact that patients react to their acoustic environment with high subjective suffering.

The recruitment of internal ear diseases, primarily as peripheral cases, possibly with (central) habituation, as well as disturbances of the central or psychical processing - usually without damage to the inner ear - can be distinguished by hypersensitivity over the entire frequency spectrum of hearing. Often, the phonophobia is characterized as a fear-coloured sensitivity against specific noises, largely independent of the loudness of the sound.

The hyperacusis is shown as a hearing-impaired problem in the sense of a lack of efferent inhibition, for example due to (stress-induced) exhaustion reactions. In the phonophobic sensitivities, there are usually intact inner ear conditions and sufficient hearing filter functions, However, learning processes (conditioning processes) lead to a reaction pattern with anxious avoidance behaviour for certain acoustic stimuli with specific meaning [54].

2.3. Depression and suicidality

Affective disorders are one of the common mental disorders among tinnitus sufferers [68]. In almost 90% of patients, inpatient patients are experiencing mental disorders such as major depression, dysthymia, anxiety disorders and somatoform disorders. In 48-60% of all inpatients treated with depressive symptoms, tinnitus can also be detected at the same time [14]. Depression is thus one of the most influential factors for high tinnitus [9]. Those with a low level of tinnitus suffering have less psychological disturbances than those with decompensated tinnitus [68].

According to various studies, factors such as sleep disturbances, anxiety, and emotional stress are often present at the time of the tinnitus, which is why you are very important in the development and perception of tinnitus [60]. Stress, conflict situations and mental exhaustion can lead to an increased perception of tinnitus and to a negative effect on its processing. Due to the mutual reinforcement of these factors, tinnitus can also be regarded as the source of a circle with the addition of depressive symptoms to suicidal tendencies or suicide. Konzag et al. however, has been shown that ambulatory tinnitus patients show a significantly increased burden of anxiety disorders, whereas depressive disorders did not show any significant differences to the 'normal incidence' of depressive diseases [33].

3. Summary
Psychosomatic / psychological aspects of tinnitus

Tinnitus cannot be seen exclusively as a hearing phenomenon. The result of damages of the hair cells, the auditory pathway to the brain with malfunctions in physiological processes leads to hearing changes. In the diagnosis and therapy of tinnitus, the impairment experienced plays a decisive role. This is in turn determined by psychological factors of the patient:

- ✓ Cognitive functions (attention, memory, interpretations, attributions)
- ✓ Emotional status or reactions (fear, anxiety, depression, personality)
- ✓ Behavioral aspects (coping strategies, avoidance, displacement or catastrophic tendency).

These psychological factors are central to predicting the quality of life with tinnitus. Thus, the reduction of tinnitus-related distress must be a major component of tinnitus treatment strategies.

- **Therapy strategies**

Multimodal tinnitus therapy

The main components

- ✓ Cognitive therapy with information dissemination and counseling and exposure exercises (CBT): The aim is to re-evaluate tinnitus and to change negative tinnitus-related thoughts and feelings. Tinnitus and hearing-specific exposures reduce noise-related anxiety and progression.
- ✓ Hearing therapy: This may include wearing tinnitus treating measurements, hearing strategies such as avoidance of silence, hearing in noisy environments, special hearing training.
- ✓ Body-related therapies including relaxation techniques: The aim is to promote physical quality of life and to reduce tinnitus-amplifying, somatic tensioning circuits.

Cognitive therapy (manualized)

Cognitive restructuring initiated by therapists with the aim of changing tinnitus-related emotions: e.g. On 'Socratic Dialogue', thought control, target formulation, exploration of automated thoughts, control of persuasion of behavioural experiments.

Cognitive behavioral therapy (as single or in the group)

Look for special behavioural settings for lowering specified fears (see above).

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Шум в ушах (Tinnitus)

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В работе описываются психосоматические и психологические аспекты тиннитуса (ушного шума).

Авторы считают, что тиннитус нельзя рассматривать исключительно как следствие нарушения слуха и результат повреждений волосковых клеток, слухового пути к головному мозгу с нарушениями физиологических процессов, что приводит к изменениям слуха и как осложнение– появлению ушных шумов.

При диагностике и лечении шума в ушах наблюдаются слуховые нарушения, которые играют решающую роль. Это, в свою очередь, определяется психологическими факторами пациента, из которых наиболее важными являются:

- Когнитивные функции (внимание, память, интерпретации, атрибуции),
- Эмоциональный статус или реакции (страх, тревога, депрессия, личностные изменения),
- Поведенческие аспекты (стратегии выживания, избегание, вытеснение или катастрофическая тенденция).

Эти психологические факторы имеют решающее значение для лечения и прогнозирования качества жизни при тиннитусе.

Основной принцип стратегии терапии ушных шумов:

- Мультимодальная терапия тиннитуса.

Основные компоненты этого лечения:

Когнитивная терапия производится при помощи специальных упражнений с целью оценки шума в ушах и связанных с тиннитусом отрицательных изменений мыслей и чувств.

Такое воздействие на слух уменьшает шум, а также связанные с ним тревогу и прогрессирование психогенных факторов.

Слуховая терапия обязательно включает в себя измерение слуха, а также такие рекомендации, как избегание тишины, настраивание на слышимость в шумной обстановке, особая слуховая подготовка.

Важное значение имеет телесная терапия, включая техники релаксации: с целью улучшения физического качества жизни и уменьшения шума в ушах, усиливающих соматическое напряжение.

Когнитивная реструктуризация, инициированная терапевтами с целью изменения шума в ушах и связанных с ним эмоциональных расстройств .

При этом важными факторами являются контроль мышления, постановка цели, исследование автоматизированных мыслей, контроль убеждения поведенческих экспериментов.

Таким образом, необходимо учитывать,что при тиннитусе важно уменьшить стресс и отношение к ушному шуму, научиться переключать внимание и поведенческие изменения.

Աղմուկ ականջներում (Tinnitus)

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Աշխատանքում նկարագրվում է ականջների տինիտուսի (ականջների աղմուկ) հոգեսոմատիկ և հոգեբանական կողմերը:

Հեղինակները համարում են, որ ականջների աղմուկը չի կարող դիտվել միայն որպես լսողության խանգարման, մազիկավոր բջիջների վնասման և ուղեղի լսողական ուղու՝ ֆիզիոլոգիական պրոցեսների խախտման հետևանք, որը բերում է լսողության խանգարման և որպես բարդություն՝ ականջի աղմուկի:

Ականջի աղմուկի ախտորոշման և բուժման մեջ որոշիչ դեր են խաղում լսողության խանգարումները:

Սա, իր հերթին, որոշվում է հիվանդի հոգեբանական գործոններով, որոնցից ամենակարևորներն են.

- ճանաչողական գործառույթներ (ուշադրություն, հիշողություն, մեկնաբանություն, վերագրում),
- զգացմունքային կարգավիճակ կամ ռեակցիաներ (վախ, անհանգստություն, դեպրեսիա, անհատականություն),
- վարքագծային ասպեկտներ (հաղթահարման ռազմավարություններ, խուսափում, ճնշում կամ աղետալի միտում):

Այս հոգեբանական գործոնները վճռորոշ նշանակություն ունեն տինիտուսի ժամանակ կյանքի որակի բուժման և կանխատեսման համար:

Տինիտուսի բուժման ռազմավարության հիմնական սկզբունքներն են.

• Մուլտիմոդալ թերապիա.

Այս բուժման հիմնական բաղադրիչներն են.

Ճանաչողական թերապիան, որը իրականացվում է հատուկ վարժությունների միջոցով `գնահատելու ականջների աղմուկը և նրա հետ կապված մտքերի և զգացմունքների բացասական փոփոխությունները:

Լսողության վրա այս ազդեցությունը նվազեցնում է աղմուկը, ինչպես նաև դրա հետ կապված անհանգստությունն ու հոգեկան գործոնների առաջընթացը:

Լսողության թերապիան անպայման ներառում է լսողության չափումը, ինչպես նաև այնպիսի առաջարկություններ, ինչպիսիք են լռությունից խուսափելը, աղմկոտ միջավայրում ձայների ընկալման կարգավորումը և լսողության հատուկ ուսուցումը:

Մարմնի թերապիան, ներառյալ թուլացման տեխնիկան, էական նշանակություն ունի կյանքի ֆիզիկական որակը բարելավելու և ականջների աղմուկի թուլացման միջոցով սոմատիկ սթրեսը նվազեցնելու:

Թերապևտների նախաձեռնած ճանաչողական վերակազմավորումը նույնպես մեծ նշանակություն ունի ականջի աղմուկը և հարակից հուզական խանգարումները նվազեցնելու համար:

Միևնույն ժամանակ, կարևոր գործոններ են մտածողության վերահսկումը, նպատակների սահմանումը, ավտոմատացված մտքերի ուսումնասիրությունը, վարքային փորձերի ստույգ վերահսկողությունը:

Այսպիսով, պետք է հաշվի առնել, որ ականջի աղմուկի դեպքում կարևոր է նվազեցնել սթրեսը և վերաբերմունքը ականջի աղմուկի նկատմամբ, սովորել փոխել ուշադրությունը և վարքաձևը:

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