

AUDITIVE STIMULATION THERAPY AST® INTERVENTION IN SUBACUTE AND CHRONIC TINNITUS

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ABSTRACT

A study at the **Tinnitus Therapie Zentrum Krefeld**, in cooperation with the **University of Witten/Herdecke, Germany**, explored the efficiency of a multimodal therapy concept (psychological training auditive stimulation therapy - AST®; kinesietherapy - Krefelder Modell) for out-patients suffering from subacute and chronic tinnitus. Over three years data on treatment results of 700 tinnitus patients were collected and evaluated in a two-phase study.

The efficiency of the entire concept was explored first. Definite improvements were achieved in regard of subjective results. 40 % of patients answered the question whether therapy had helped them to cope with ear ringing with "excellent", 29 % with "good" and 16,8 % with "satisfactory".

In comparison with studies into other treatment concepts with hospitalized patients and out-patients, the multimodal treatment concept described above also produced noticeably better therapy results.

1. INTRODUCTION

Tinnitus Aurium is derived from Lat. Tinnire (ringing) and describes all types of ear and head sounds. There is a basic difference between objective and subjective tinnitus. The term **objective** tinnitus is used for ear sounds based on genuine physical vibrations. They may be perceived by others or registered by technical means (Feldmann 1992). This type of tinnitus is rather rare.

Subjective tinnitus is far more frequent. In these cases, only the person afflicted perceives the sounds. These may occur as rustling, whistling, whirring, ringing, or droning noises or sounds. High frequency sounds are perceived far more often than low frequency sounds (our own measurement/ M. Pilgramm et al. 1999), and a hearing impairment is detectable in over 50 % of all cases.

In subacute tinnitus, there are three defined phases: the acute phase, the subacute phase, the chronic phase.

The acute phase covers the time from the first incidence of the symptom up to a period of ca. 3 months afterwards. All diagnostic and traditional interventions should be performed in this period. Cases where medical inter-vention has not been sufficiently successful and traditional therapies have all been tried out after three months, are termed to be in a transition period, the subacute phase. This period is often decisive for the future progress of symptomatics. Afflicted patients are often told: "We cannot do anything else for you, you will have to live with this

from now on." Their reactions are diverse. Some develop self-help strategies to *ignore* ("turn a deaf ear to") and thus accept the symptom; others fall into a – for themselves - hopeless situation which might mean a heightened perception of the subjectively experienced sounds.

After about 6 months (Wilhelm et al. 1997) we speak of chronic tinnitus, the degree of which differs considerably from person to person and afflicts patients in different ways. A patient may be well able to tolerate a *compensated* tinnitus, so that no further intervention is required, unless there are no relevant organic causes. A *decompensated* tinnitus is accompanied in most cases by other complaints, e.g. depression, anxiety, impaired sleep and concentration, sensitiveness to noises etc. (Duckro et al., in: Kröner-Herwig 1997, p.1); consequently, intervention is required.

2. AUDITIVE STIMULATION THERAPY AST®

The Auditive Stimulation Therapy **AST®** is a compact programme of music therapy designed by the author of this paper (Martin Kusatz); it was originally employed in the treatment of chronic pain and developed specifically for tinnitus treatment. It comprises a total of 10 therapy sessions and consists in specifically developed receptive music pro-programmes (MSC-Training®, MW-Training®) in combination with an education programme. The objective is to improve a patient's emotional state and also to induce relaxation, to reduce anxiety and to stimulate changes in behavior patterns that are unfavorable from the therapist's perspective (MSC Training®). A particular focus is on perception of ear ringing which has to be controlled and influenced via music therapy intervention (MW-Training®). The education programme is aimed at alterations on a cognitive level.

3. THE STUDY

At the **Tinnitus Therapie Zentrum Krefeld**, in cooperation with the **University of Witten/Herdecke, Germany**, a research study was performed on a multimodal treatment concept (**Krefelder Modell**) in out-patient treatment of subacute and chronic tinnitus over a projected period of three years. Data on treatment results for 700 tinnitus patients were collected and evaluated in a two-phase study.

The out-patient therapy (duration: 2 weeks) comprised a total of 38 hours of therapy (20 h **psychological training**; 10 h **auditive stimulation therapy – AST®**; 8 h **kinesietherapy**) and also included counselling by ENT experts, orthopedists and dentists. Data were collected with questionnaires immediately prior to and after therapy, with a follow-up after 6 months.

Apart from anamnestic data, the questionnaires also asked for a subjective evaluation of treatment. The tinnitus questionnaire designed by Goebel & Hiller, now the recommended standard tool throughout Germany, was in addition employed at all times of measurement in **phase I** (n=155/ pre-post-follow-up). In **phase II** (n=545/pre-post) it was used prior to and after the onset of the treatment.

The entire concept was first tested for efficiency. Clearly observable improvements were achieved with a view to subjective results.

In answer to the question whether the therapy helped them to cope better with the ear ringing, 40 % of patients described the success as "excellent", 29 % as good and 16,8 % as satisfactory.

At a follow-up six months after the end of the therapy another question was whether any ear ringing was still perceivable. 3,2% of patients said none at all. A temporary absence of ear ringing was the answer of 30.8 %; about two thirds of patients continued to perceive noises during the six months after the therapy ended; however, these had been clearly reduced. In summary, 52,3 % indicated further positive changes after the therapy was concluded.

The results of the tinnitus questionnaire TF indicated clearly measurable improvements in the general strain induced by ear ringing at all points of measurement.

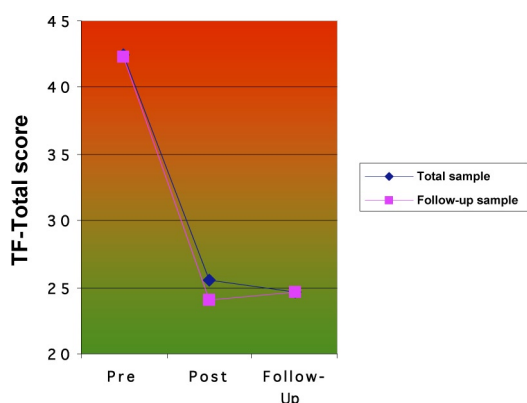


Figure 1: TF-Total score

Total sample

(Pre: N=146, Post:N=146, Follow Up: N=106)

Follow-Up sample

(Pre: N=106, Post:N=106, Follow Up: N=106)

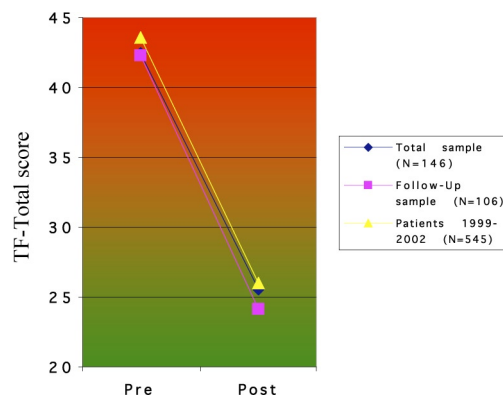


Figure 2: Comparison of TF Total scores of phase I and phase II (Pre-Post)

We were able to demonstrate that the multimodal concept evaluated (**Krefelder Modell**) achieves highly significant changes.

The calculation of effect size according to the tinnitus questionnaires illustrated that the most significant effect sizes occurred in the area of psychological stress and in the changes of the total scores.

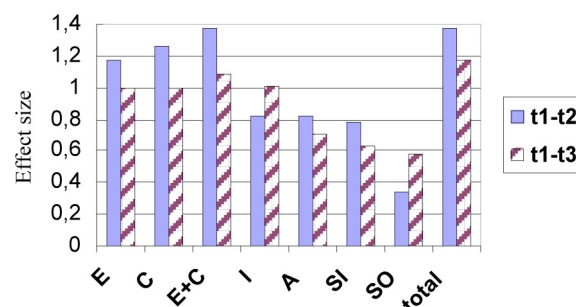


Figure 3: Changes in scale values of effect sizes (N=106)

E = Emotional stress; C = cognitive stress;

E+C = psychological stress; I = intensity of tinnitus;

A = auditory impairments; SI = sleep impairments;

SO = somatic disorders

3.1 The significance of music therapy (AST®) as part of the treatment concept

As the treatment concept presented in this study (**Krefelder Modell**) is a multimodal concept, the different elements of treatment have to be compared in order to achieve more detailed results on the efficiency of the music therapy training programme (AST®). Kinesitherapy having received a distinctly lower rating by patients, only the two treatment elements rated as most successful were compared (psychological training PT – music therapy MT). The findings gained in this way were then used to draw conclusions on the significance of individual therapies for the entire therapy concept.

Comparing the individual therapies, music therapy training (AST®) was responsible for a surprisingly high percentage of the positive total result and clearly preferred by patients despite the fact that psychological training was twice as long (20 therapy sessions hours compared to 10 for music therapy). For further analysis of these findings, effect sizes at measurement times for patients of phase I were calculated and related to the patients' subjective evaluation. The following graph illustrates the calculation of effect sizes:

As expected, the effect size in groups who rated music therapy training as more successful

(AST®) is clearly higher compared to psychological training. The most expressive results in this context certainly are those of the follow-up, since the data of these particular patients are available for all measurement times. In retrospective they were able to come to a conclusive evaluation for themselves. Effect sizes for the group are as follows:

MT+ (AST® most effective)
between 1,13 and 1,6

PT+ (PT most effective)
between 0,92 and 1,29

MT=PT (AST® and PT most effective)
between 1,21 and 1,67

This means that a combination of MT and PT renders the best effects. MT alone is in second place, and PT third. The combination of MT=PT comprises the partial therapies MT and PT, and this suggests that the share of MT in this result is higher than that of PT. In addition, MT shows excellent effect sizes over longer periods as well; a clear indication of the quality of the concept of AST® as to contents and didactic implementation. The results appear to confirm in particular the intention to enable patients to continue independently with music therapy and to make autonomous use of receptive music programmes.

In comparison with studies into other therapies with hospitalized patients and out-patients, the advantages of the multimodal treatment concept as described above with a view to treatment results have been amply demonstrated. The fact that the Krefelder Modell is the only concept to use the music therapy training programme, combined with the significance of this programme for the entire treatment concept indicates that the advantage compared to other treatment forms which have been evaluated is mainly due to music therapy intervention.

4. CONCLUSIONS

An analysis of the tinnitus issue, in particular from a traditional perspective, suggests a general confusion among most experts, although renowned scientists have explored the problem. A great variety of models and treatment approaches are available, the effectiveness of which, however, is still inconclusive. The standard therapy in Germany e.g. is medication in tablet form supporting the blood flow, or, with increasing frequency, infusions as part of a period in hospital, with disproportionate side effects compared to the severity of the complaints (Bork, 2000). The question remains: Why this helplessness in medical treatment of tinnitus?

If we assume that tinnitus is not a disease in itself but a symptom, then we may imagine that traditional methods will hardly suffice to cope with this symptom. Symptom-oriented treatment does not lead to satisfactory results in this case (Pilgramm et al.). 61 % of patients state that professional medical help was of not much use – a shockingly high figure in view of the numerous medical interventions. There is much to suggest a holistic treatment approach and to see the ringing in the ear as a sign of particularly high stress. The question whether the symptom is of a somatic or a psychosomatic nature seems to be of no importance in the treatment of subacute and chronic tinnitus. An analysis not only of the biological but also the psychological and social background of patients (Aldridge 1998) provides a more comprehensive insight into and understanding of their situation. This might well explain the salience and high acceptance of music therapy AST® among patients. On this extended basis of knowledge it should be possible to develop coping strategies for patients that address the causes of the problem directly and thus render the symptom superfluous.

5. REFERENCES

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