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## Low Level Laser Therapy of Tinnitus

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### Introduction

Tinnitus is an auditory perception appearing without an objective sonic source from the outer environment. Tinnitus can be subjective (heard only by the patient) and objective (sound can be even heard also by others). According to literature, fifteen percent of entire population have experienced at least a tinnitus episode some time, its incidence and severity rising with age up to approx. Eighty-five percent of population older than 60.

Low Level Laser Therapy (LLLT) has been suggested as a possible therapy for tinnitus. Several studies have used Ginkgo biloba infusions in combination with LLLT, the former being a widespread but not well documented therapy for tinnitus.

Success of therapy of any disease always depends on the level of its casual impact on a particular disease or symptom. As well as there is no joint cause for tinnitus, there is no universal therapy of this disease either. For years, medicamentous therapy has been based upon vasoactive medication, and antihistaminic and psychopharmacologic, too.

### Method

The study comprised of 103 patients (62 male and 41 female). Patients were divided into two groups treated by laser (72 patients) and placebo laser (31 patients). Group treated by laser did not differ from placebo group significantly, average age of both groups and also sub-groups of male and female was in range of 50 - 56 years, total average of all 103 persons is 52.

Prior to the application of LLLT, all the patients underwent the following pre-therapy examination:

1. Anamnesis (aimed especially at the fact whether tinnitus was caused by an acoustic trauma, as well as at genetic predisposition).
2. Subjective evaluation of suffering
3. Clinical examination (otoneurology, axial skeleton, nystagm, blood pressure)
4. Technical examination (audiogram, x-ray of neck vertebra, ENG tinnitometry)
5. Laboratory testing

MediCom MAESTRO laser device was used for the study, with an infrared laser probe 830nm and power output 300mW. The following application dosages and frequency modulations were applied on the following points.

1. meatus acusticus externus - in the direction of the axis of the auditory duct - continuous beam 50 J followed by 25 J, frequency modulation of 5 Hz
2. processus mastoideus - directly on the center, the vector of the beam in the direction of counter-lateral orbit, continuous beam 90 J, followed by 45 J with 5 Hz frequency modulation

At the beginning, attendance was scheduled to 10 procedures in total, twice a week.

Having completed the first series, patients returned after 2 - 3 months for another two series, each consisting of 5 - 6 therapies, once a week.

With regard to the level of subjectivity of tinnitus we tried objectivity this subjectivity to maximum possible extent. We set percentage scale (patients had evaluated their complaints 100 percent at the beginning of therapy, adjusting this figure with regard to further development).



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## Results

In order to simplify the effect of therapy as much as possible the results were divided in four groups:

1. Patients with no effect of comprehensive therapy
2. Less than 50% relief
3. More than 50% relief
4. No more tinnitus, patient free of the disease.

The results in the two groups Active Laser/ Placebo Laser were as follows: no effect 20.8/22.6%, less than 50% relief 26.4/48.4%, more than 50% relief 30.6/25.8%, no more tinnitus 22.2/0%

The results obtained are shown in diagram.

We have quite unambiguously proven the significance of therapy with non invasive laser beam in therapy of tinnitus. In combination with comprehensive care for patients, therapy with non invasive laser is a priority from the point of view of the rate of expectation of therapeutic results. With the use of a placebo laser we have also quite convincingly came to conclusion that our results could never be reached with a device emitting no laser light.

## Discussion

22.2% patients never again suffered from tinnitus after treatment with therapeutic laser. This is a great success of LLLT. It only confirms the leading role of LLLT within comprehensive laser rehabilitation therapy of tinnitus. On the other hand we must stress the necessity to apply the two remaining parts of our therapeutic triad as well, since medication and physiotherapeutic manipulation are integral parts of the general care of our patients, and we should not deprive the suffering of the means and methods capable of bringing them more relief, which we are aware of.

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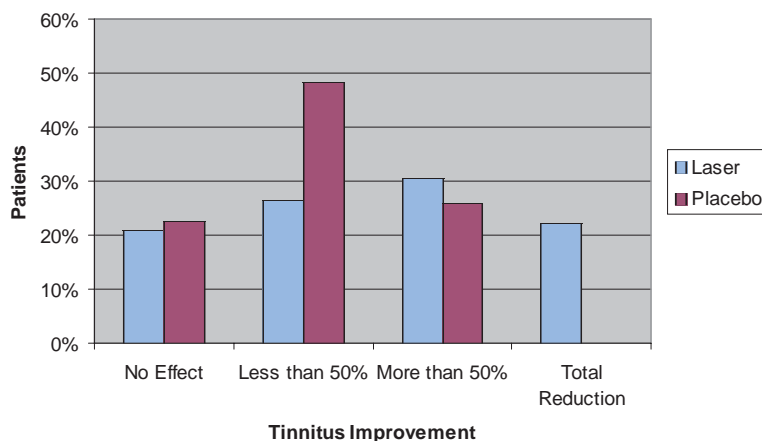


Irradiation of meatus acusticus externus.



Irradiation of processus mastoideus.

**Tinnitus Clinical Results of Laser Therapy  
Active Laser and Placebo Laser Groups**



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