Temporomandibular Joint and Masticatory Muscle Disorders in Patients with Tinnitus

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**Objectives**

The frequent concurrent occurrence of tinnitus and temporomandibular joint and masticatory muscle disorders (TMD) has led to the assumption of a possible relationship between these two conditions. However, the scientific community still debates whether tinnitus and TMD are coexistent or independent, or whether the two symptoms have a causal connection. The present prospective clinical study was conducted to verify the potential correlation between TMD and tinnitus on the basis of three research hypotheses:

I. The prevalence of perceived tinnitus is higher in patients with TMD than in patients without TMD.
II. In patients with both tinnitus and TMD, TMD is found on the ipsilateral side.
III. Dental functional therapy has a positive effect on perceived tinnitus distress.

**Methods**

- **Prospective clinical trial**
  - 951 Patients referred to the Department of Prosthodontics
  - 82 TMD patients
  - 529 without TMD
  - 30 TMD & tinnitus

**1. Classification of TMD and tinnitus (n=30)**

<table>
<thead>
<tr>
<th>TMD</th>
<th>Tinnitus</th>
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<tbody>
<tr>
<td>1. Detailed functional analysis of the masticatory system</td>
<td>THI questionnaire 25 questions → 5 severities</td>
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<tr>
<td>2. Severity of TMD (wakana index)</td>
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<td>3. TMD diagnosis (RDC/TMD)</td>
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<td>3a. Muscle disorder</td>
<td></td>
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<tr>
<td>3b. Disc displacement</td>
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<td>3c. Arthralgia, osteoarthritis, oedemaarthrosis</td>
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**2. TMD functional therapy (n=25)**

- Occlusal splint therapy
- Physiotherapy
- Stabilization splints (Michigan) or distraction splints
- Pain in temporomandibular joint
- Pain in masticatory muscles
- Joint sounds
- Limited mandibular movements
- Tinnitus

**3. Revaluation after 3 to 5 months (n=25)**

- Pain improved
- No change to baseline
- Improvement
- Complete remission

**Conclusions**

I. The risk of having tinnitus is 8.37-times higher for patients with TMD than for patients without TMD. All patients with unilateral TMD and unilateral tinnitus had both symptoms on the ipsilateral side. → The study strongly reinforces the putative association between tinnitus and TMD.

II. The application of dental functional therapy in patients with TMD-related tinnitus improved or eliminated tinnitus symptoms in approximately half of the patients. → TMD therapy in patients with TMD-related tinnitus seems feasible.

III. The treatment success of TMD-related tinnitus decreases with the duration of tinnitus. → Early intervention in patients with TMD-related tinnitus is necessary.