Headache Medicine

# Impact of somatosensory tinnitus and painful temporomandibular disorder in patients with migraine

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**Introduction**

Tinnitus is defined as a perception of sound in the absence of an external sound stimulus. In somatosensory tinnitus (SST), there may be changes in the perception of frequency or intensity of sound due to different stimuli to the somatosensory system, such as through increased muscle tension in the masticatory or cervical muscles. Individuals with Temporomandibular Disorders (TMD) have a high prevalence of tinnitus, reaching up to 80%, and are approximately twice as likely to have some type of headache, such as migraine. When muscle pain is involved, the presence of migraine seems to be a factor that increases the risk of tinnitus. Chronic pain presented by individuals with TMD, fibromyalgia, neuropathic pain, migraine and other pain syndromes are related to the central sensitization process. Central Sensitization Syndrome (CSS) represents an abnormality of the nociceptive system, where neuronal hyperexcitability generates poor processing and deficit in pain modulation, which contributes to its expansion and chronicity. Painful TMDs, tinnitus and migraine are conditions that share many similarities with respect to associated comorbidities and pathophysiology, indicating that they are disorders where there is CSS involvement.

**Objective**

The present study sought to verify the association between SST and painful TMD in migraine patients.

**Results**

The mean age among the individuals in this study was 40.9 years ( 12.7). Among patients with migraine, most were female (n=24; 88.9%) and there was no statistically significant difference in age between groups. Of the patients with migraine, about 66.7% (n=18) had SST and complaints of dizziness or vertigo, and this association was statistically significant (p=0.032; p=0.008 respectively), with patients with SST having 2 .86 times more likely to have migraine (95% CI: 1.08-7.58). Ear fullness was present in 40.7% of patients with migraine (p=0.014), with a 3.7 times greater chance of this symptom being a complaint of these patients (95% CI: 1.26-10.8). The degree of discomfort due to hyperacusis, measured using a visual analogue scale, had a median of 4 (0-8; p=0.025) among patients with migraine, despite this symptom not being statistically associated in these patients (p=0.352). The presence of SST, painful TMD and higher scores on the Central Sensitization Inventory were positively correlated with the presence of migraine (r=0.243; p=0.032; r=0.295; p=0.009; r=0.378; p<0.001 respectively ).

**Conclusion**

The presence of somatosensory tinnitus and painful TMD can be considered risk factors for migraine, representing comorbidities within CSS. Knowing part of the complex relationships between these conditions helps in the selection of specific treatment modalities, aiming at personalized strategies that seek to reduce tinnitus, pain and suffering.

**Keywords**: Migraine Disorders, Tinnitus, Temporomandibular Joint Disorders, Central Nervous System Sensitization