



# Stress, Sex, Smoking, Sounds, Sleep, and Sensitization— Studies on Associations, Risk Factors, and Mechanisms in Orofacial Pain

A variety of factors ranging from psychological stress and occlusal variables to gender and sleep may be related to the expression of chronic orofacial pain conditions such as temporomandibular disorders (TMD) or atypical odontalgia. Several articles in this issue of the *Journal of Orofacial Pain* report on studies that have explored some of these possible associations or risk factors. Although the article by Yoshihara et al does not set out to address whether stress is the cause or effect of TMD, it does document that TMD patients are more reactive to psychological stress than healthy controls, as reflected in significantly higher levels of and more prolonged elevation of plasma cortisol, adrenaline, and nonadrenaline. Of related interest is LeResche et al's article, which presents the results of the first prospective study of TMD pain during pregnancy. The authors show that psychological distress changes little over the course of pregnancy in female TMD patients, while signs and symptoms of TMD improve over this period. They attribute the TMD improvements to the marked sex hormone changes during pregnancy, which is interesting in light of earlier studies reporting that use of oral contraceptives and hormone replacement therapy increases the risk for TMD. Other TMD risk factors suggested in the literature include occlusal factors and smoking. The latter is addressed in Wänman's article reporting that smoking is not an important element influencing the development or maintenance of TMD, while no causal relationships were found in the study reported by Hirsch et al between overbite or overjet and temporomandibular joint (TMJ) sounds defined according to the Research Diagnostic Criteria for TMD. Their study suggests that normal functioning of the TMJ is associated with wide ranges of overbite or overjet. Joint sounds were also the subject of a study by Baba et al. Since they report that joint sounds, as well as gender, are significantly associated with the duration of masseter muscle activity during sleep, it will be interesting to investigate this association further, given the frequently cited view that muscle hyperactivity is a factor in sleep bruxism and that sleep bruxism is causally related to TMD. Sleep

bruxism is also the focus of the article by Ommerborn et al, who report on the utility of a recently developed computer-based approach to the assessment of sleep bruxism.

One of the remaining articles is a case report by Mourouzis et al of occipital neuralgia associated with respiratory tract infection. The other 2 papers in this issue focus on dental pain and possible mechanisms. The study by Baad-Hansen et al utilized the blink reflex, which a recent review article in the *Journal* indicates may be useful in the diagnosis of orofacial pain conditions.<sup>1</sup> No difference in blink reflexes was found between the painful and nonpainful sides of patients with atypical odontalgia. The blink reflex also was not significantly modulated by experimental pain induced by the intraoral application of capsaicin, the chemical in hot peppers that acts as an irritant on the vanilloid receptor TRPV1 in peripheral tissues. As the authors indicate, further studies are needed to clarify the potential role of peripheral as well as central mechanisms, including sensitization, in atypical odontalgia. The TRPV1 receptor is also the focus of the article by Morgan et al who document that TRPV1 is present in the dental pulp and that TRPV1 expression in pulpal nerve fibers and vascular cells is greater in carious and painful teeth, respectively. Since TRPV1 has been shown elsewhere in the body to be an important signaling mechanism in the responses of nociceptive afferent fibers to heat and irritant chemicals such as capsaicin and in the sensitization of the fibers, it offers a novel therapeutic target to control pain, and so it will be important to study further the role of these receptor mechanisms in acute and chronic orofacial pain conditions.

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#### Reference

1. Jääskeläinen SK. Clinical neurophysiology and quantitative sensory testing in the investigation of orofacial pain and sensory function. *J Orofac Pain* 2004;18:85–107.