The Society of Oral Physiology 26th Store Kro Club Conference

May 7–10, 2009
Dresden, Germany

The 26th scientific meeting of the Society of Oral Physiology (the former Store Kro Club) took place in Dresden, Germany, from May 7–10, 2009. The Society brings together members and some guests interested in the physiology of the masticatory system and related structures. The meeting in which 102 delegates participated consisted of 25 oral and 34 poster presentations. The following briefly outlines selected topics divided into five main categories (and also indicates the presenters of each topic).

Jaw Biomechanics. The condyle-fossa distance depends upon the degree of contraction of the jaw-elevator muscles. Indeed, this distance decreases significantly when closing from the postural position into maximum intercuspation, indicating that the "best" unloading of the temporomandibular joint (TMJ) is obtained by muscle relaxation (Palla et al). In TMJs with an anterior disc displacement with reduction and with but not without intermittent locking, intensive gum chewing leads to a delay in the disc reduction time. In some cases, the disc reduction even disappears, indicating that joint loading may affect the disc biomechanics (Kalaykova et al). Intensive long-lasting chewing leads not only to muscle fatigue and pain but interestingly also to a reduction in muscle stiffness (Koutris et al), while chewing of large size and harder-texture bolus increases the degree of head flexion and extension, suggesting that there is a linkage between the recruitment of the neck and jaw muscles (Häggman-Henrikson et al). This connection was demonstrated also in another study showing that the amount of body sway immediately decreases/increases after inserting/taking off an intraoral appliance, both in patients with a history of whiplash-associated disorders and in healthy controls (Eriksson et al). This observation raises new questions about the influence of the jaw system on postural control.

Previous studies have shown that the ratio in the electromyographic (EMG) activity of the jaw-elevator muscles between the working and balancing side differs between unilateral chewing and isometric biting. This difference disappears during chewing along with a decrease of the interocclusal distance, indicating that the neuromuscular strategy involved in both tasks is similar and is influenced by receptors signaling the amount of interocclusal distance (Pröschel et al). Furthermore, during isometric biting, the same working/balancing ratio as during chewing was recorded only when subjects bit on a resilient medium that allowed a small jaw-closing movement (Morneburg et al).

Orofacial Pain: Clinical Research. It was reported that in a southern Chinese population, the prevalence of widespread pain, depression, and somatization is higher in patients with than those without orofacial pain, although the prevalence of widespread pain seems to be lower and that of psychological distress higher than in western counterparts (McMillan et al). This may indicate the importance of cultural, ethnic, and possibly genetic factors in pain perception. Interestingly, and likely clinically relevant, were the observations that the prevalence of temporomandibular disorder (TMD) signs and symptoms is higher in patients with than those without eating disorders (Johansson et al) and that the risk of developing a pain condition in the facial, head, and spinally innervated area within a 2-year period is higher when the subject reported already a pain condition at baseline (Marklund et al).

The efficacy of an occlusal appliance in reducing masticatory myalgia is nonspecific, since two occlusal appliances with different designs were equally effective even after 12-months follow-up (Doepel et al). Concordant results were reported by a study showing that three different splints had similar efficacy in reducing bruxism-related symptoms. The wearing comfort, however, differed with the splint adjusted in the most comfortable position being the most comfortable (Niedermeier et al). The reports of the next two studies confirmed previous results, eg, that a simple educational and physiotherapy program aimed at reducing muscle contraction and increasing the capability of perceiving it when it is too elevated is able to reduce the prevalence of headache and cervical pain and consequently the pain-related disability (Milani et al and Ferrero et al).

Orofacial pain is most easily curable when correctly diagnosed and the pain is not chronic. Assessment of pain chronicity becomes therefore mandatory. The Pictorial Representation of Illness and Self Measure[1] is a simple visual instrument that proved valid in detecting patients with high pain-related suffering and could therefore help the clinician in screening those TMD patients who need more comprehensive assessment and treatment (Ettlin et al).

As it could have been anticipated, Dr Kirveskari's lecture that reported that occlusal interferences are a health risk that increases the probability of seeking treatment led to a very animated discussion that once more showed how emotional the topic of occlusion is in today's "TMD world."

Orofacial Pain: Basic Research. The pathophysiological mechanisms behind localized muscle pain are still largely unknown. Clenching during wake time seems to increase the risk of localized masticatory muscle. During a prolonged, low-level muscle contraction lasting up to 30 minutes, some motor units (Cindarella units) fire continuously. They may therefore get overloaded and damaged and are therefore likely candidates for localized muscle pain (Farella et al). Central sensitization processes are implicated in the transition of acute to chronic pain and in the maintenance of chronic pain. New findings indicated that non-neural cells (astroglia) are critically involved in the sensitization process produced in medullary nociceptive neurons in animal models of acute and chronic orofacial pain (Sessle).

Obstructive Sleep Apnea. It has been repeatedly reported that a mandibular advancement device (MAD) reduces obstructive sleep apnea (OSA) in the short to medium range. A placebo-controlled study showed that this reduction seems to parallel that of a continuous positive airway pressure device (CPAP) also in the long term, eg, up to 12 months in patients with a mild to severe apnea (Aarab et al). However, as shown by a longer follow-up study, the MAD continues being effective primarily in cases with nonsevere OSA. The drawback of a long-lasting MAD therapy is the higher risk of dental arch alterations (proclination of lower incisors and possibly reclination of the upper ones) (Doff et al). In non-obese OSA patients, the volume of the upper airway at the retropalatal level as measured by magnetic resonance imaging decreases when laying on the back with the jaw opened; at 10 to 15 mm this was not seen in controls. The findings indicate that the OSA patients have an impairment of upper airway muscle tone. The airway volume reduction disappears and the apnea decreases when the mandible is advanced with an MAD to about 75% of maximum protrusion (Chen et al).

Oral Physiology. By means of a miniature loading device, Minagi et al confirmed that vital teeth are more sensitive than nonvital ones, supporting the hypothesis that intradental receptors contribute to tooth sensitivity. Electrical stimulation of the superior laryngeal nerve and of the pharyngeal branch of the glossopharyngeal nerve elicits swallowing in animals. Using a newly developed technique by which electrodes are inserted through the nose, Kurose et al provided new insights into the physiology of human swallowing. They showed that this reflex can be elicited by stimulation of the hypopharynx and oropharynx, although elicitation is easier with the first than the second stimulation. Another new finding was the observation that tongue movement during swallowing is altered in the elderly. The authors of these studies must be complimented for having opened a new research avenue that may become important in light of the aging population and its related disphagic problems.

Some patients with complete dentures complain of altered taste perception because of palatal coverage. In dentate subjects, the perception of sweet, sour, salt, and bitter was only slightly altered by covering the palate, although there was interindividual variability. The threshold never exceeded more than two dilution steps. This indicates that other factors more than the palate coverage account for the complaint of altered taste perception in complete denture patients (Jüch et al). Also intriguing were the results that differences in food taste should affect not only the rhythm of muscular activity but also brain activity during chewing. The latter was assessed by measuring the blood flow in the brain by means of near infrared spectroscopy.

All in all, this was a very interesting scientific meeting that provided the audience with several new findings. In accordance to the tradition of the Society, sufficient time was left for social activities so that the participants could interact and visit and appreciate the beauty of Dresden, in particular how well the city has been reconstructed. We will all remember its cathedral, the Frauenkirche, because it has been reconstructed as a landmark symbol of reconciliation between former warring enemies. Professor Utz and his organizing team must be complimented for having put together a stimulating meeting, both scientifically and socially.

Sandro Palla
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Reference

1. Mühleisen B, Büchi S, Schmidhauser S, Jenewein J, French LE, Hofbauer GF. Pictorial representation of illness and self measure (PRISM): A novel visual instrument to measure quality of life in dermatological inpatients. Arch Dermatol 2009;145:774–780.