Dental occlusion/temporomandibular joint and general body health

Drs Yong-Keun Lee & Hyung-Joo Moon discuss clinical evidence and mechanism of an underestimated relationship

**1) Synchronization of head & jaw muscles with other muscles**

There is a necessary systematic synchronization of the head and jaw muscles with the other muscles of the body to maintain proper body posture. The functional blending of the stomatognathic system with the neck muscles is well known. Patients suffering from occlusal or TMJ disorders have reported dysfunction and pain in their neck muscles.1, 2 An imbalance of sternocleidomastoid muscle activity, often leading to neck pain, can be induced by a unilateral loss of occlusal support.3-5 The biomechanical impact on cervical vertebrae during mastication has been calculated, which confirmed that vertical occlusal alteration can influence stress distribution in the cervical column.6 Possible associations between trunk and cervical asymmetry and facial symmetry have been reported.7 For example, it has been found that visual perception control is most important in orienting the head in the frontal plane.8 A relationship between dental occlusion and postural control has also been postulated.9

**2) TMJ and body stability**

**Dental occlusion**. TMJ condition exerts an important effect on body stability. Human beings assume a relatively unstable postural state when in the standing position; therefore, the maintenance of a standing position is postulated to initially be the centre of gravity, which is controlled by information from the ocular region, the three semi-circular canals and anti-gravity muscles.10 It has been suggested that occlusion and head position affect the centre of gravity, resulting in an increased risk of falling when abnormal.11 Poor or absent dental occlusion may decrease proprioception in this area, interfering with the proper stability of the head posture.12 It is thought that tooth loss is a risk factor for postural instability.13 Physiologically, mechanical receptors in the periodontal membrane control mandibular movements and coordinate masticatory function,14 and this is related to the motor activity of the neck muscles.

Fluctuation in the centre of gravity caused by altering the occlusal contact area experimentally was examined experimentally, and the results confirmed that occlusal contact affects gravity fluctuation and that appropriate occlusion attained by maintaining even occlusal contact in the posterior region is crucial for gravity fluctuation.15

**3) TMJ & physical performance**

TMJ conditions can influence physical performance. Trainers often advise athletes to wear occlusal splints or mouth guards during competitions in order to increase motor performance.16 It has also been reported that proper tooth-clenching plays an effective role in the enhancement of physical performance.17

The relationship between the presence of occlusal support in edentulous subjects and their capacity for physical exercise has been investigated, and it was concluded that reconstruction of occlusal support holds significance not only for the restoration of masticatory function but also for the maintenance of physical exercise.18, 19

**Mechanism of relationship between the TMJ and general body health** Based on the myofascial aspect it is first hypothesizing that TMJ and other parts of the body are connected through fasciae, which is a connective element between various anatomical structures, and has been confirmed experimentally, and the results confirmed that there is a stretching of fasciae. For example, it has been found that visual perception control is most important in orienting the head in the frontal plane.9 A relationship between dental occlusion and postural control has also been postulated.9

**Correlation between trigger points and acupuncture points**

Although separated by two millennia, the traditions of acupuncture and myofascial pain therapies share fundamental similarities in the treatment of pain disorders.20 Recent reports have suggested substantial anatomic, clinical and physiological overlap of the myofascial trigger points and acupuncture points.21 The analogy between the trigger points and acupuncture points has been discussed since 1977,22 when 300 per cent anatomic and 71 per cent clinical pain correspondences for the myofascial trigger points and acupuncture points in the treatment of pain disorders were reported.23

A number of similarities between them were also suggested. The two structures have similar locations and needles are used at either point to treat pain. The pain associated with the local twitch response at trigger points is similar to the de qi sensation, and the referred pain generated by needling trigger points is similar to the propagated sensation along the meridians.24 It was pointed out, however, that the acupuncture points located at the trigger points are not frequently used by acupuncturists, and do not share the same clinical indications as the trigger point therapy.25 It was further argued that the claim of 71 per cent correspondence between the acupuncture points and the trigger points is conceptually impossible. Furthermore, even putting this conceptual problem aside, no more than 40 per cent of the acupuncture points correspond to the treatment for pain and, more likely, only approximately 18 to 19 per cent of the points are actually correlated.26 The correlation between the trigger points and the acupuncture points clearly need to be further investigated in the future.

The fascial connection theory we propose can explain the functional connection between dental occlusion/TMJ and other parts of the body based on either myofascial release or the qi and meridian system, or a combination of both. Therefore, dental occlusion is important to maintain in a normal natural condition, while causes for deterioration of the TMJ status should be treated in an effort to restore the natural condition.

**Editorial note** - This article is a summary of two review papers recently published in the Journal of Alternative and Complementary Medicine 17 (2011): 995–1000 & 1119–24. A complete list of references is available from the authors.

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