Dental occlusion/temporomandibular joint and general body health

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

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. Recent reports have suggested substantial anatomic, clinical and physiological overlap of the myofascial trigger points and acupuncture points in the pain disorders.

1) Synchronisation of head & jaw muscles with other muscles

There is a necessary systematic synchronisation of the head and jaw muscles with the other muscles of the body to maintain proper body posture. The functional coupling 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. An imbalance of sternocleidomastoid muscle activity, often leading to neck pain, can be induced by a unilateral loss of occlusal support. 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. Possible associations between trunk and cervical asymmetry and facial symmetry have been reported. For example, it has been found that visual perception control is most important in orienting the head in the frontal plane. A relationship between dental occlusion and postural control has also been postulated.

2) TMJ and body stability

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

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. It has also been reported that proper teeth clenching plays an effective role in the enhancement of physical performance.

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.

Mechanism of relationship between the TMJ and general body health based on the myofascial aspect is the first hypothesis of this article that TMJ and other parts of the body are connected through a three-dimensional network extending throughout the whole body. This network can be stretched by the contraction of underlying muscles and transmit tension over a distance. The fascial tissues are arranged vertically, from head to toe, and four interconnective transverse fascial planes crisscross the body. Therefore, an injury should occur in one part of the body, pain and dysfunction may occur throughout the body.

Mechanism based on qi and the meridian aspect

The second hypothesis is that the TMJ and other parts of the body are connected through the meridian system, which is constituted of the fasciae. Traditional acupuncture meridians are believed to form a network throughout the body, connecting peripheral tissues to each other. Studies that seek to understand the acupuncture point/meridian systems from a Western perspective have mainly focused on identifying distinct histological features that differentiate acupuncture points from surrounding tissue. One of the biological and anatomical associations with the meridians is intermuscular or intra-muscular loose connective tissue (fascia). Ancient acupuncture texts contain several references to “fat, greasy membranes, fasciae and systems of connecting membranes” through which the qi is believed to flow. In terms of connective tissue associations, several authors have suggested that the fascia may exist between the acupuncture meridians, which tend to be located along the fascial planes between muscles or between a muscle and bone or tendon, and the connective tissue. In view of experimental evidence, it has been hypothesised that the network of the meridians can be visualised as a representation of a network of interstitial connective tissue.

These findings are supported by ultrasound images showing connective tissue cleavage planes at the acupuncture points in human beings. Rather than viewing acupuncture points as discrete entities, it has been proposed that these points might correspond to sites of convergence in a network of connective tissue permeating the entire body, similar to highway intersections in a network of primary and secondary roads.

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