

CORRELATION BETWEEN POSTURE AND OCCLUSION

Bracco P.

University of Turin, Italy

Introduction

In the last years, a number of researches investigated the various determinants that may influence body posture. Respiration, head and neck position, mood states have been assessed to have effects on posture (1). Among those determinants, recent studies seem to demonstrate a role of trigeminal afferences and dental occlusions on proprioception, visual and postural stabilization (2). Moreover, the possibility that there could be a relation between stomatognathic pathologies, such as temporomandibular joint disorders, and postural disorders have been investigated (3). The aim of the present paper was to verify if different jaws relations modify posture in a sample of human subjects.

Methods

The sample for the study was constituted of 95 subjects (23 males, 72 females), average age 29 yrs (range 18-52). All subjects were asymptomatic volunteers without information on the aim of the study. They were preventively investigated in order to exclude signs and/or symptoms of temporomandibular disorders and of psychiatric disorders. Posture was analyzed in three different mandibular positions: centric occlusion (or intercuspid position); rest position; myocentric position. This is a position referred to the muscles, obtained by the transcutaneous electric neural stimulation (TENS) technique, according to Jankelson. TENS was provided and monitored by means of a computerized mandibular scan CMS (mandibular kinesiograph K6-I) and the Myo-monitor J3 (both Myotronics Inc, Tukwila, WA).

The kinesiograph is able to record mandibular position in three dimensions of space and simultaneously record the bilateral electromyographical activity of the masseter, anterior temporalis, sternocleidomastoideus and upper trapezius muscles. Myo-monitor supplies low frequency, low amplitude TENS stimulation to the muscles innervated by the mandibular division of the trigeminal nerve, causing muscles to contract once every 1,5 s. Each subject underwent the TENS stimulation for at least 45 s: when a stable mandibular position and a good muscular balance (EMG controlled) were reached, the myocentric position was recorded by an intraoral bite registration acrylic resin material, later used for the fabrication of an orthosis.

Subjects posture was evaluated by a computerized posturographic and stabilometric footboard. For each subject, three different registrations on the footboard were taken: the first in centric occlusion (maximum intercuspidation, ICP); the second with the cotton rolls (rest position, REST); and the third with the orthosis (myocentric position, MYO). The three tests were recorded consecutively, without moving the subject on the footboard: tests were recorded with open and closed eyes. Closed eyes results were considered in this research. Both posturometric and stabilometric data were considered: from the load graph, the percent difference of load on right and left lower limbs was calculated. The obtained value was assumed as asymmetry index of weight distribution. Ideally, the global weight has to be distributed 50% on each lower limb, that means asymmetry index is 0.

The analysis of variance for repeated measures (ANOVA) test with the Student-Newman-Keuls Multiple Comparisons post test were performed in order to verify whether eventual postural variations in the different mandibular positions were statistically significant. The statistical analysis was made using GraphPad InStat (Ver 3.01, Graphpad Software Inc. San Diego, CA, USA). The hypothesis is that there is not any difference: if $P < 0.05$ eventual differences are significant. The test was repeated for asymmetry index, x distance and y distance. The post test was then used for relating the average values two by two, to verify which mandibular position eventually corresponded to a significant different posture.

Results

There was a strong relation between mandibular position and body posture: 91 out of 95 (96%) subjects showed variations in load distribution closing mouth either in centric occlusion or in centric relation or in myocentric position. Furthermore, 92 out of 95 (98%) subjects showed changes also in the distance between theoretical and real barycenter on x axis, and 95 cases out of 95 (100%) showed changes on y axis. Similar results were observed by the authors in previous experiences (2).



The Rehabilitation of Sports Muscle and Tendon Injuries

Conclusions

The results seem to support the observation that different jaws relations imply differences in body posture.

References

1. Bolmont P et Al. Mood states and anxiety influence abilities to maintain balance control in healthy human subjects. *Neurosci Lett* 329: 96-100, 2002.
2. Bracco P et Al. Observations on the correlations between posture and jaw position: a pilot study. *J Craniomandib Pract* 16: 252-258, 1998.
3. Braun BL Postural differences between asymptomatic men and women and craniofacial pain patients. *Arch Phys Med Rehabil* 72: 653-656, 1991.