

AN ELECTROMYOGRAPHIC EVALUATION OF MUSCLE SYMMETRY IN NORMO-OCCLUSION SUBJECTS

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INTRODUCTION

Assessments of morphological symmetry craniofacial have become a part of the usual characterization of both healthy subjects and in patients (Ferrario et al., 1994). The evaluation of functional symmetry of the complex craniofacial usually involves the patterns of movements in the jaw and the activities of the masticatory muscles (Naeije, McCarrroll & Weijs, 1989; Ferrario, Sforza & Serrão, 2000). Patterns of contraction of pairs of muscles can be investigated using surface electromyography (EMG), which enables the monitoring of some of the major masticatory muscles (masseter and temporalis). The aim of this study was to analyze the possible existence of asymmetries between the muscles masseters and temporalis anterior on both sides in subjects with normal occlusion and relate the EMG findings of asymmetry with data from the clinical evaluation of the stomatognathic system.

METHODS

Thirty subjects (13 men and 17 women) with an average of 20.77 years, healthy, with normal occlusion, complete and permanent healthy teeth including second molars (at least 28 teeth), with molar and canine into bilateral Angle class I (+/-1 mm). Data obtained through the following questionnaires: 1. RDC / TMD (Dworkin, LeResche, 1992), 2. Analysis Oclusal (Sheet FORP / USP), 3. Signs and Symptoms

(Felício), 4. Fonseca's Questionnaire (1994). For the electromyographic examination was used Freely EMG (DeGötzen, srl, Milan Italy) and disposable silver/silver chloride bipolar surface electrode (Duo - Trode, Myo-Tronics, Inc.). In order to reduce skin impedance, the skin was carefully cleaned prior to electrodes placement, and recordings were performed 5–6 min later, allowing the conductive paste to adequately moisten the skin surface. Three tests were recording: Test 1: Maximum Voluntary Clench (MVC) with cotton-roll (standardization); Test 2: MVC without cotton-roll (test where the dental relationship is considered), and Test 3: Alternate 'maximum' voluntary contractions and relaxations with a 1 Hz frequency (dynamic clench-relax test). The 3 seconds intermediaries of electromyographic waves of the pairs of muscles were compared computing the Percentage Overlapping Coefficient (POC), Torque Coefficient (TC), Asymmetry Index (ASSIM), Activation Index (ATTIV) and Impact (IMPACT).

RESULTS AND DISCUSSION

EMG potentials of the four analyzed muscles as per cent of maximum voluntary clench on cotton rolls (unit: mV/mV x 100) recorded in the two 3-s tests, as well as the average muscular potentials are reported in Table 1. In the questionnaire applied research of the severity of the signs and symptoms of DTM, the results are in line with expectations for the young and healthy

asymptomatic subjects. The index proposed in this work (POC), to quantify asymmetry, has advantages in relation to the index proposed by NAEIJE et al. (1989) and used in many works, because it analyzes the EMG wave whole and not just averages, and better employee at work where there are large EMG variations (FERRARIO et. al., 2000). The subjects of the search have undergone clinical evaluation fonaudiologic and for the confirmation of inclusion criteria, which brings the reliability of the sample, resulting in more reliable data. The data found was expected because of the other work (FERRARIO et. al., 2000), in different populations had average values very similar to the ones found in this study. Despite of some aspects of the functions themselves are changed, these changes do not appear to relate to a framework for DTM. Such changes should be probably to other problems such as the oral breath and open bite, aspects observed in the sample evaluated.

SUMMARY/CONCLUSIONS

The results showed that the subjects young adults evaluated had average values of asymmetry within the standards of normality already established for other people. Probably figures are also valid for the

Brazilian population, but many other studies with samples should be conducted. Such data could assist in the diagnosis of patients with some type of temporomandibular dysfunction.

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Table 1 and 2: EMG mean potentials as per cent of MVC on cotton rolls, and EMG indices, in 30 healthy young adults (mean \pm SD). Percentage Overlapping Coefficient (POC), Torque Coefficient (TC), Immediate Torque (ITC), Asymmetry Index (ASSIM), Activation Index (ATTIV) and Impact (IMPACT).temp: temporalis muscle; mm: masseter muscle.

Group	Electromyographic results			
	POC temp	POC mm	POC mean	TC
Health	86,96 \pm 3,20%	86,51 \pm 3,33%	86,75 \pm 2,48%	8,60 \pm 1,08%

Group	Electromyographic results			
	Assim	Attiv	Impact	ITC
Health	3,39 \pm 6,55%	-2,30 \pm 11,84%	101,53 \pm 32,15%	0,62 \pm 4,11%