



ISB 2013 BRAZIL

XXIV CONGRESS OF THE INTERNATIONAL
SOCIETY OF BIOMECHANICS

XV BRAZILIAN CONGRESS
OF BIOMECHANICS

ELECTROMYOGRAPHIC EVALUATION CASES OF TENSION HEADACHES TYPE THROUGH FUNCTIONAL ADJUSTMENT OCCLUSAL

Ferreira LMDB¹, Berzin F¹, Santos JLB¹, Barela J²

¹ Department of Anatomy, Faculty of Dentistry of Piracicaba - FOP / UNICAMP. liegedb@gmail.com

² Faculty of Physical Education of Rio Claro –UNESP

INTRODUCTION

The Tension-type headache (CT) is a heterogeneous disorder of central origin and location, with several possible etiologic factors, including muscle tension involving muscles of the head and neck, psychosocial stress, poor posture and others. [1]. The aim of this study was to investigate the relationship between occlusal anatomy and electromyographic activity of masticatory muscles in cases of tension-type headache. In this study we investigated the occlusal position of 2 volunteers from 48 to 28 years with all the teeth, Angle class I, stable occlusion, complaining of headache on the right side of the forehead and clenching night, and who had the diagnosis of neurological Tension-type headache for 9 years.

METHODS

Muscular Digital palpation was performed, picking up the change in muscle mass, in Superficial Masseter (SM) and Temporal, anterior belly (AT) muscles, at the time of the first dental contacts. We evaluated the brands of occlusal contacts obtained by Bausch articulating paper. Associating these information, was made the Functional Occlusal Adjustment (FOA) [2]. For electromyography test was used the equipment BIOEMG1000 (Lynx ® São Paulo, SP, Brazil). We analyzed the muscular symmetry in two ways: in activity [3], and interval on set time of the activity (through mathematical routine programmed in Matlab) between right and left muscles MS and right and left TA, during the intercuspitation, at first jaw stability. The collections post occlusal intervention were performed immediately after it, and one week after the FOA. Our evaluation of referred pain was made by Visual Analogue Scale (VAS), and the pre assessment by Research Diagnostic Criteria (RDC).

RESULTS AND DISCUSSION

The adjustments that alter the normal position of the jaw can be the result of adapted muscle work when performed differently than normal [4]. The knowledge of biomechanics can identify occlusal imbalances that drive the positioning of the jaw, changing the working muscles directly or indirectly related to it. The FOA was performed with the

intention of promoting improvement in balance and symmetry of activity in masticatory muscles, through information provided by the occlusal anatomy and Digital Muscular Palpation [4]. It was found a significant increase in the rate of symmetry activity immediately after occlusal intervention in both muscles studied. The reduced levels remained after one week, suggesting that during this period, remained stable occlusal promoted the adjustment of the muscles. (Fig. 1)

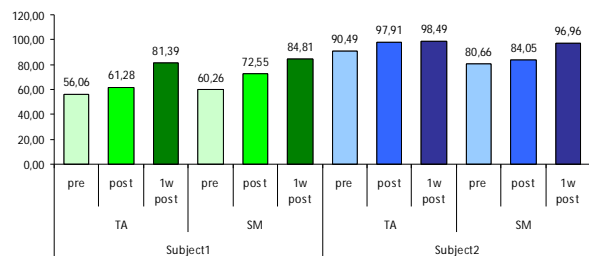


Fig 1: Indices (in percentage) of muscle activity MS right and left, and TA right and left, Pre, Post and Post 1 week of FOA.

The evaluation of the time interval between the onset of muscle activity in MS contralateral and AT contralateral, showed a significant decrease after the occlusal intervention, and was maintained after one week, confirming the stability of the jaw during occlusion in functions performed. The results suggest that careful interpretation of the direction of forces acting on the muscle during occlusion when unbalanced, allowed appropriate intervention that brought mandibular stability, balance, muscle activity and reduction of referred pain. (Fig 2)

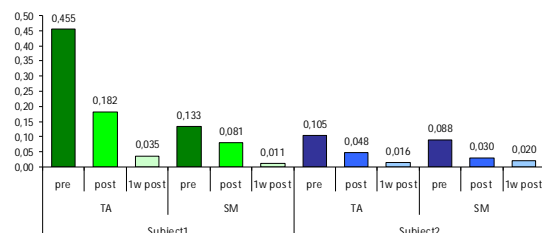


Fig 2: Values of intervals of on set time of the beginning of muscle activity MS right and left, and TA right and left, Pre, Post and Post 1 week of FOA.

Immediately after the occlusal intervention of FOA, referred pain decreased significantly [7] and the picture remained stable despite other central / peripheral influences, suggesting that the occlusal imbalance may have been a reasonably proportion as contributing factor to the onset of CT. (Fig 3) [5.6]

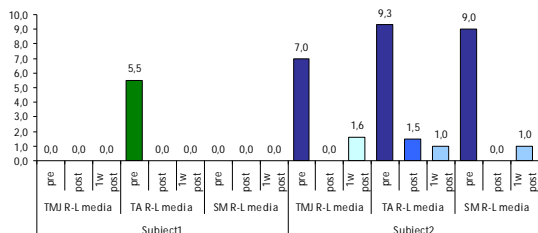


Fig 3: Values of the Visual Analogue Scale Pre, Post and Post a week of AOF

CONCLUSIONS

- There was a change in the electromyographic activity of the muscles studied after Functional Occlusal Adjustment.
- There was overall improvement in reporting of pain.
- This study suggests that DDS has an important role in diagnosing and interence appropriately on occlusal imbalances that can be part of the type of tension headache, which must be addressed multidisciplinary.
- Functional Occlusal Adjustment, which relates the masticatory muscle activity and occlusal anatomy, suggests to be an alternative treatment and effective solution for order imbalances and muscle discomfort related to head and neck, but randomized studies are needed with larger populations.

REFERENCES

1. Jensen R. Paiva T. In: Olesen J, Tfelt-Hansen P, Welch KMA (eds). *The Headaches*. New York: Raven Press, 1993:497-502.
2. Santos, JLB. In Simões, W.A. *Ortopedia Funcional dos Maxilares vista através da Reabilitação Neuro-Occlusal*. 3ª Ed. São Paulo. Artes Médicas. 314-330, 2003
3. Naeije M, McCarroll R. S, Weijs W.A. *Electromyographic activity of the human masticatory muscles during submaximal clenching in the inter-cuspal position*. J of Oral Rehab. 16:63-70, 1989
4. Funakoshi M, Amano N. *Periodontal Jaw Muscle Reflexes in the Albino Rat*. J Dent Res. 53:598, 1974
5. Li J, Jiang T, Feng H. *The electromyographic activity of masseter and anterior temporalis during orofacial symptoms induced by experimental occlusal highspot*. J of Oral Rehab. 35; 79-87, 2008
6. Hunning, S.V. *Estudo dos distúrbios oclusais em posição máxima com papel articular e palpação dos músculos masseter superficial e temporal anterior numa mostra de portadores de cefaléia crônica tipo Migraine e voluntários normais*. Tese de dissertação de Mestrado apresentada à

Universidade Federal do Rio grande do Sul. Porto Alegre. 2000

7.. Forssell H, Kirveskari P, Kangasniemi P. *Changes in headache after treatment of mandibular dysfunction*. *Cephalalgia*. Dec;5(4):229-36, 1985