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TENSION-TYPE HEADACHE, TEMPOROMANDIBULAR HEADACHE AND OCCIPITAL NEURALGIA DUE TO SEDENTARINESS, ANXIETY AND CRANIO-VERTEBRAL INSTABILITY: CASE REPORT – A MULTIDISCIPLINARY THERAPEUTIC APPROACH

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Abstract

The headache is one of the most wide-spread symptoms in general population of any age and any condition and thus many researches have been conducted in order to find out the causes involved in its occurrence.

It has been noticed a higher incidence of any type of headache in sedentary persons, especially secondary headaches. The diagnosis and therapeutic approach must take into account all the biomechanical, psychological and postural aspects in order to give a correct differential diagnosis.

We present the case of a patient, 33 years old female, diagnosed with chronic cervical pain and headache. After implementing a multidisciplinary therapeutic strategy, making some lifestyle changes (fighting the sedentariness), investigating the psycho-emotional aspects that can accentuate the symptomatology and adopting ergonomic measures for stabilising the lumbar spine, we noticed the total remission of the headache (occipital neuralgia), after 8 weeks, a significant drop in intensity and frequency of the headache after 3 weeks and a significant decrease in frequency and intensity of the tension headache.

Key words: headache, sedentariness, posture, malocclusion, manual therapy, ergonomics

INTRODUCTION

The headache is a frequently met symptom among the population that is attributed to many causes originated in very diverse anatomical and/or functional areas. 80% of the world population has suffered episodes of headache of variable intensity and duration at a certain moment (Stovner et al., 2007).

The importance given to this symptom and its causes lead to research studies on different populations to find out if there is certain distinctiveness (Yoon et al., 2012).

Thus, a higher incidence was noticed in sedentary persons, regardless of age (Bektaş et al., 2015). Sedentariness means adopting a posture and preserving it unchanged for at least 5 hours, without subsequent dynamic compensation. Frequently, those persons complain about headache episodes attributed erroneously to certain "popular" causes (draught, cold, weather changing, stress, high blood pressure or hypotension, digestive disorders, premenstrual syndrome or menopause, artificial light) that are imputed and not identified - which delays or makes the identification of the primary cause impossible.

The patient uses the self-medication (which only controls the symptoms) or a treatment focused on visible causes (orthodontic treatment, psychotherapy in bruxism, hormone or antihypertensive medication, etc.), with small or partial results in the frequency and intensity of the headache, but the real cause remains unidentified (Barbanti et al, 2014; Wilhelm, 2012).

As regards the secondary headaches (such as those determined by mechanical irritations at the upper cervical spine, with isolated or simultaneous irradiation towards several areas of the cranium), the diversity of localisation and pain types hinders a lot in finding an accurate diagnosis. An example of confusion is the occipital neuralgia, considered by the scientific community to be a type of headache (the cervicogenic headache), which doesn't always respect the anatomic territory specific to the occipital nerve that is frequently irritated by the posterior cranio-cervical myofascial structures, possible atypical irradiations existing in the antero-lateral area of the cranium or in the angle of the mandible (Becker, 2010; Fernández de Las Peñas et al., 2007; Yuan et al., 2016; Bartsch, Goadsby, 2003; Di Paolo et al., 2017).

Another frequent confusion is the overlapping of a secondary headache (Svensson, 2007) on a pre-existing primary form, for example: the temporomandibular headache (Manfredini et al., 2011) overlapped on a hemicrania medical background.

During my clinical practice and especially during the doctoral study period carried out under the supervision of Prof. Petru Mihancea, PhD, I have noted that more types of headaches emerge regularly at the sedentary persons, especially the secondary type, and the diagnosing and therapeutic approach (Castien et al., 2011; Stuhr et al., 2014) must take into account all the biomechanical, psychological (Karibe et al., 2015) and postural (Radas et al., 2013; Mongini et al., 2012) aspects in order to give a correct differential diagnosis.

OBJECTIVES

A. Demonstrating the biomechanical alterations between the cranium's base and atlas (C1), between C1 and axis (C2), in persons with lumbopelvic instability induced by a prolonged seating position.
B. Implementing a therapeutic strategy based on manual cranio-cervical therapy techniques with immediate benefits regarding the intensity and frequency of the symptoms in patients with chronic instability at the upper cervical spine.
C. Demonstrating the mechanisms through which the biomechanical lumbopelvic imbalance participates in the worsening and chronicization of the temporomandibular headache.
D. The efficiency of global therapeutic approach in patients with occipital neuralgia - the improvement of the cranio-cervical-mandibular (CCM) balance and the stabilisation of the lumbar spine by adopting customised ergonomic measures and fighting sedentariness.

MATERIAL AND METHOD

CASE STUDY

The patient – aged 33, sex: female – comes to the Physical Therapy-Rehabilitation Department within *Linea Medica* Clinic in Oradea (Romania), with the following clinical presentation:

- malocclusion with dysfunction at the left temporomandibular joint (TMJ) - diagnosis given by the orthodontist,
- headache and cervical degenerative discopathy - diagnosis given by the neurosurgeon.

The anamnesis, the functional examination of the stomatognathic system and the overall postural evaluation track down the following:

A. Anamnesis

● *bruxism* – present constantly for the last 8 years;
● *chronic cervical pain* – for about 10 years; it coincides with the period of sedentary work. As reported, the pain has an intensity of 5 (on a scale from 1 to 10), a frequency of 2-3 episodes per week, variable duration (2 to 6 hours) partially correlated with the seating position and with stress; it disappears during sleep;
● *headache* in the left frontal-temporal and occipital area – with an intensity that for the most part goes beyond the subjective value of 8, with a daily frequency and duration ranging from 5 to 24 hours. The triggering and aggravating factors are: cold, sudden movements and stress. It is frequently associated with photophobia, dizziness, bright flashes, nausea and sometimes vomits. The patient states that the symptoms have commenced 8

years ago, with some dental extractions (the patient remaining afterwards edentated for 8 years), a psycho-emotionally traumatising event and the growth in the duration of sedentary working programme.
● *insomnia* – fractionated sleep.

B. Functional examination of the CCM complex (according to Valerio Palmerini Concept)

B1. Inspection:

● *alteration of the mandibular dynamics with left lateral deviation*, with a painful limitation of the opening at 30 mm;
● *a slight limitation of the left laterality movement* (under 10 mm), with a pain of 9 in intensity (on a scale of 1 to 10).

B2. Palpation:

● trigger points in the anterior and posterior area of the left mandibular condyle;
● trigger points on all the fascicles of the left temporal muscle;
● trigger points all over the surface of the left masseter muscle (sensitive structure at the endo-buccal palpation, too);
● trigger points on the left sternocleidomastoid muscle;
● trigger points on the bilateral sub-occipital tissues.

Other functional tests highlighted a significant limitation of the active and passive cervical flexion, owed to a defence reflex at the intensity of the pain and to a cranio-cervical myofascial restriction.

The C0-C1-C2 examination points out a rotation towards left (C1 being the salient one, in accordance with Rocabado Concept).

C. The postural examination showed the following:

● *in the anterior frontal and posterior plane*: no significant alterations noticed; it is relevant is that both the bipupillary plane and the occlusal plane are tilted leftwards, meaning that there is a primary problem at the level of the C2 vertebra, according to Rocabado;
● *in the sagittal plane*: the protrusion of the head, a phenomenon with double explanation:
- the adaptation of the cranium to an ocular refraction issue (R.E. - 1, L.E. + 0.75),
- the compensation of the biomechanical lumbopelvic instability induced by the prolonged position in the lumbar flexion, that is secondary to the seating position.
● *inspecting the seating position:* the patient adopts a position in accentuated lumbar flexion (see Image 1) and a compensatory cranio-cervical hyperextension (upper cervical spine), in order to optimise the visual field (according to Bricot Concept).
● *upon palpation:*

- anterior myofascial retractions of the muscles of the upper limbs, of the rectus abdominis muscles, of the anterior diaphragm and of the sub-occipital tissues (according to Souchard Concept);
- compensatory hypertrophy of the dorsolumbar muscularity;
- fascial retractions in the posterior chains of the lower limbs.

During walking, the patient partially corrects the imbalance from the previously described sagittal plane. Likewise, it is ascertained a slight limitation in the propulsion of the foot.

With the patient's consent, the following multidisciplinary therapeutic strategy was established:

1. Manual mobilisation and specific exercises to reduce the painful syndrome of the left TMJ and to improve the mandibular dynamics.
2. Manual cranio-mandibular therapy in order to reduce and even eliminate the myalgia.
3. Educating the patient as regards the restrictions and ways of maintaining the functionality of the stomatognathic system and deglutition.
4. Cranio-mandibular therapy for temporomandibular disorder.
5. Occlusal mouth guard for levelling the contacts and the Neuromuscular Reprogramming.

There were six sessions of specific manual therapy, 60 minutes per session, and daily exercises for stimulating the symmetry in the mobility of the TMJ, simultaneously activating the lateral pterygoid muscles in the protrusion. Two occlusal mouth guards were also applied, one for rest and one for reprogramming.

Practically, it was agreed upon:

● fractioning the time spent seating with movement activities;
● walking daily for about 1 hour;
● a manual therapeutic sub-occipital/cranio-cervical intervention to eliminate the fascial restrictions from this level, responsible for the irritations in the nervous structures (C2), and to improve the C0-C3 biomechanics, a segment found in a chronic dysfunction compensated in the area of the lower cervical spine through hypermobility, which is responsible for the osteoarticular wear of this segment;
● as ergonomic measures for stabilising the lumbar spine, we suggested to use lumbar support pillows (*Lumbar Roll – The Original McKenzie*, of 9 cm in diameter and *Comfortex Comfort Car*) for the office chair and the car seat and to optimise the distance between the eyes and the monitor;
● as general exercises for stabilising and preserving the benefits for a long-term period, we proposed customised exercises from Sahrmann and Souchard Concepts.

RESULTS AND DISCUSSION

After three weeks, the subjective and functional evaluation has marked out the following modifications:

● A significant diminishing in the pain of the left TMJ – this pain still lingering at the maximum mandibular opening and at the left laterality;

● A slight diminishing of the headache.

Since the evolution was favourable in terms of the cranio-mandibular compartment and the patient has difficulties in differentiating accurately the headache from the temporomandibular pain and the chronic cervical pain, we suggested the necessity of a global approach as regards the balance improvement at the level of the CCM complex and the postural alignment, the change in lifestyle by fighting the sedentariness and also by investigating the psycho-emotional aspects that can accentuate the symptomatology.

The consistent carrying on of the previously described treatment has led to the following results:

- The total remission of the headache – the cervical component (occipital neuralgia), after 8 weeks since the starting of the specific therapy (manual cranio-cervical therapy, C0-C3 balancing);
- A significant drop in intensity and frequency in the headache – the temporomandibular component, after 3 weeks since the starting of the specific manual therapy and of the orthodontic treatment.
- A significant decrease of the tension headache in frequency and intensity – an aspect of special importance. Since there is no instrument for delimiting accurately the dominant component of the headache and its causes (Gonzalez, Manns, 1996), the only guide which we can rely on is the "map of the pain", a subjective description of the painful cranial area, correlated with the objective data concerning the fascial restrictions felt upon palpation that overlap on the trigger points.
- Improvement of the postural balance by adopting ergonomic measures and practising the suggested specific exercises;
- Psycho-emotional comfort by reducing the anxious symptomatology and therefore diminishing the bruxism.

Figures 1 and 2 demonstrate the immediate adaptation of the proximal corporeal segments at the modification of the sacro-lumbar angle induced by placing a lumbar pillow on the back of the office chair. The red arrow indicates the angle of the cervical spine curvature and the yellow one – re-acquiring the physiological curvature of the lumbar spine.

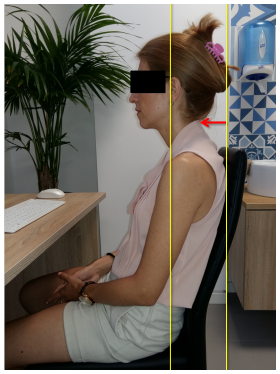

Figure 1. Initial, habitual position

Figure 2. Position after placing the lumbar pillow

Comparatively, figures 3 and 4 show the modification of the proportion between the cheek bone and mandible as a result of changing the position of the cranium subsequently to the placing of the lumbar pillow.

In seating position with lumbar instability, the weight centre of the body glides a lot towards the posterior direction, thus determining an adaptive reaction of head protrusion; to maintain the visual field horizontally, the cranium performs a hyperextension on the first cervical vertebra with the mandible being pulled along through the traction of the supra- and infrahyoid tissues towards the posterior direction, too (modifying the cranio-cervical angle, according to Rocabado).

Although the alterations occurred at the level of the antero-posterior occlusal plane are of the order of millimetres, they have extremely important consequences not only at the level of the contacts between the pieces of the two arcades, but also at the level of the TMJ where attrition phenomena take place due to neuromuscular and osteoarticular imbalance.

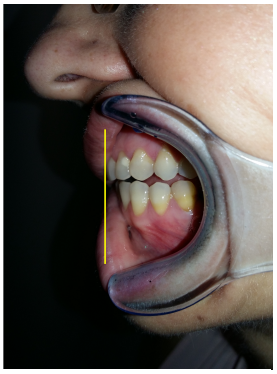

Figure 3. Initial position

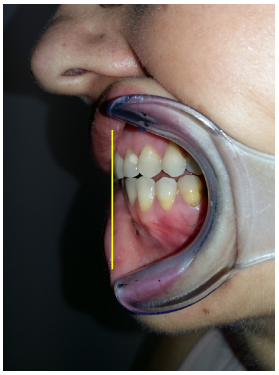

Figure 4. Position obtained following the raising of the cranio-cervical angle

The benefits of the specific manual therapy have been demonstrated on all the components of the headache found at this patient, thus contradicting more or less the only therapeutic approach of primary headaches – the medicines-based treatment.

The explanation would be that at the root of this painful syndrome there is the chronicization of certain pathologic mechanisms inducing myofascial restriction in the area of the cranium and of the upper cervical spine, altering the mandibular dynamics induced by malocclusion (Gadotti et al., 2005) or bruxism, the equilibrium ratio between the base of the cranium and the cervical vertebrae (Fernández de las Peñas et al., 2007), the excessive distension of the cranio-cervical and cranio-mandibular tissues (Wade, 2015) when adapting the upper corporeal segments at the ascending imbalances, habits, twitches determining parafunctions (Solow, Sandham, 2002), postural issues and not the symptom per se.

Regardless of the origin, the interruption of the cause-effect vicious circle (Bevilaqua Grossi, Chaves, 2004; Falla et al., 2007; Martins et al., 2016) leads to the improvement of the symptomatology.

The position of the mandible in retrusion – induced by optimising the visual field through the cranio-cervical hyperextension - overstresses the muscular tissues in charge with the control of the mandibular dynamics, irritating the nervous structures within the afferent territory, thus resulting one of the three possible consequences: myalgia and/or arthralgia of the TMJ, with secondary headache of the TMD.

The hyperextension of the cranium on the first cervical vertebra reduces a lot – even up to elimination – the physiological spaces between the base of the cranium (C0) and C1, respectively between C1 and C2, inducing a mechanic suffering on the vessels and the strongly innervated musculature from the base of the cranium or frequently on the occipital nerve.

The clinical manifestation of these modifications is the cervicogenic headache (neuralgia), with upper irradiation in the territory of C2 or with anterior (orofacial) irradiation, through the mechanism of interconnections at the level of the trigeminocervical nucleus.

The manual therapy applied on the cranio-cervical and cranio-mandibular tissues, the specific exercises, as well as the relaxation techniques learnt during psychotherapy do not succeed in controlling entirely the tensions around the cranium, in the mandibular area and of the cervical spine; we had to add targeted and customised ergonomic measures, with low costs, but great benefits, in order to obtain the aimed the results.

CONCLUSIONS

1. When diagnosing the headache, the specialists usually make reference to a certain type, detecting very seldom, in the clinical practice, two or more types of overlapped headaches in the symptomatology of a single patient. Our case study presents the ways of diagnosing three types of headaches (one primary and two secondary) in the same patient, in accordance with the Diagnostic Criteria for TMD: Diagnostic Decision Tree (Palmerini, 2015).

2. The objective alterations presented in this study demonstrated the close connection between the adaptive lumbar flexion and the cranio-vertebral instability present in patients with occipital neuralgia and tension headache.

3. At the same time, it was demonstrated the influence of the postural ascending imbalance on the mandibular dynamics.

4. Minimum changes in the ergonomics of the working space entail major changes at the level of the tissues of the CCM complex that are involved in the imbalances with drawling and disabling symptomatology, with psycho-social and economic impact not quantified yet.

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