

**STUDY ON THE EFFECTIVENESS OF THE KINETIC
METHODS APPLICATION TO PATIENTS WITH RHEUMATIC
DISEASES AND TEMPOROMANDIBULAR JOINT
DYSFUNCTION**

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Key words: Temporomandibular joint dysfunction, the functional assessment, treatment, rehabilitation.

Abstract: Choosing the appropriate treatment solution coupled with appropriate therapeutic management is the ideal solution for achieving superior results in the treatment of algo-dysfunctional syndrome of the TMJ (TMJD). The study aims to test some kinetic methods that may cause the reduction and control symptoms of algo-dysfunctional syndrome of the TMJ.

Materials and methods: The study was conducted in the period October 2009-September 2011 and was included 83 patients with various inflammatory and degenerative rheumatic diseases, and presenting symptoms of temporomandibular joint dysfunction (TMJD). The rehabilitation techniques that were applied interest the upper jaw (the maxilla), lower jaw (the mandible) and soft tissues of the face and of the neck. The patients included in the study followed the kinetic treatment for three months with more percentage at the beginning of the study, because of the intensity of the symptoms, the frequency decreasing with the improvement of the tested indices.

Results: The clinical examination of the pain reveals a decrease of the intensity by increasing the number of the patients presenting moderate and low pain. There was 12.11% percentage decrease of the pain during the night time, and 2.41% decrease of the pain during the day time. After three months of treatment it was revealed the decrease or even the absence of joint noises during the motion so 27.71% of tested patients present noises when opening the mouth, 12.04% when closing the mouth, 8.43% from protrusion, 3.61% from retraction, and 18.07% to side movement. After the application of the kinetic methods of the treatment, the majority of the patients present values of the range of motion (ROM) close to normal limits. At the level of the tested muscles it was revealed a decrease of the

pain by 25-30%. The muscle contracture significantly decreases after 3 months of treatment. The atrophy is present in a low proportion compared with other indices. Also it was revealed a decrease of dysfunction, and an increase of the physical and psychological comfort. Statistically, there are significant differences between the two moments of the testing, the value of the significance being t below 0.05.

Conclusions: The kinetic reeducation for the patients included in the study favored the obtaining of a correct posture of the head, of the neck and of the trunk, the obtaining of normal processes of mastication, swallowing and respiration and the correction of neuromuscular imbalances.

Introduction

About 40% -70% of adults have experienced at least one symptom of the algo (painful)-temporal-mandible joint dysfunction, but in most of the cases it was treated superficially, leading to worsening of the symptoms. Due to the complexity and variability of the manifestations the painful-dysfunctional syndrome of the temporal-mandible joint (TMJ) can cause significant structural and functional changes, which in time lead to decrease the work capacity, reduce opportunities to carry out daily activities, diminishing of family support because of mental impairment of the patient (1).

At the joint level the inflammatory and degenerative manifestations such as arthritis and arthritis are responsible of generating pain and mandible dysfunction. (2) The clinical table 1 is dominated by the triad: pain, joint cracklings and joint mechanical disturbances (2). The movement therapy, through its effects and the applied noninvasive methods, can improve the existing symptoms and may change the patient's opinion regarding the condition of suffering.

Establishing a treatment plan involves customizing all general data regarding the clinical, functional and laboratory aspects and a summary of all clinical and biological, functional, psycho-socio-economic and behavioral indices of the patient. After this complex evaluation, the medical kinetic approach of the case involves the elaboration of a functional diagnosis and choice of the optimal therapeutic solution, based on the theoretical and practical achieved experience, the optimal therapeutic solution that will condition all the stages of general and local treatment.

Motivation of research

The application of kinetic treatment is required due to limited previous treatments that have not concerned to maintain or restore the functionality at this level leading to structural, functional and aesthetic changes. Choosing the appropriate treatment solution coupled with appropriate therapeutic management is the ideal solution for achieving superior results in the treatment of the painful-dysfunctional syndrome of the TMJ.

Purpose of research

Given the complexity and variability of the algo (painful)-dysfunctional syndrome symptoms of TMJ, seen in selected patients, the study aims at choosing the most effective of kinetic means, and their appropriate application to each. The study aims to test some kinetic methods that may determine the decrease and/or control symptoms of the algo (painful)-dysfunctional syndrome of the TMJ.

Materials and methods

To identify a complete and correct protocol for evaluation and treatment a prospective study was performed, that has investigated a number of subjects with rheumatic diseases and presenting symptoms of temporal-mandible joint dysfunction (TMJD). The study was conducted during the period October -2009 - September 2011 and included 83 patients with different inflammatory and degenerative diseases. The symptoms of the *acute stage presents* joint pain, referred pain, inflammation and localized warmth, limitation of movement. It is recommended medication AIS and /or AINS for pain relief, muscle relaxant medication and easily chewable diet foods and liquids. Depending on the type of the disease, the rest is recommended in degenerative lesions and the movement and exercises, controlling pain, when there is an inflammatory process. It is required orthodontic care, and if there are any teeth less areas, it will be fixed dentures, to not overuse the TMJ. The application of the occlusal trays or palatal plates (orthodontic devices) keeps the joint resting for a while to decrease the pain.

The symptoms of the sub acute phase are expressed through the pain reference, the muscle spasm and limitation of the movement. The physical therapy aims to reduce muscle spasm, referred pain and to restore mandible movements through the corrective exercises

(4). The functional rehabilitation therapy is also supported by the orthodontic means such as: to decrease the daily and nightly bruxism, as special means to restore the support given by the molars and to restore normal occlusion...

The symptoms of chronic phase include severe pain, muscle spasm and limitation of movement especially in the morning, decreasing during the day (5). The treatment of *chronic phase aims* to increase the range of motion (ROM), rebalancing the agonist and antagonist muscles groups of the neck and face and proprioceptive recovery. The treatment was applied to groups of patients and individualized for each case according to diagnosis, the treatment final solution was found by studying in details the case and after browsing the preceding steps of the actual treatment.

The treatment of patients in the research was applied methodologically, as follows:

- 3 sessions / week for two weeks;
- 2 sessions / week for the next two weeks;
- 1 session / week up to 3 months;

The duration of a session was between 60 to 90 minutes, the time varying, aiming to obtain the local and general relaxation of the patient.

The goals in the rehabilitation process are:

- Local and general relaxation;
- Eliminate painful symptoms;
- Eliminate muscle spasms and residual tensions;
- Increase of the range of motion;
- Restore the morphology and aesthetic aspect of the face;
- Rebalancing the agonist and antagonist muscle groups of the neck and face;
- Muscular coordination;
- Proprioceptive rehabilitation;
- Restoring the body scheme through an accurate mental representation of different mandible functions;
- Maintaining a correct posture of the head, neck, trunk and scapular-humeral joint.

All these objectives can only be achieved by an early, aggressive, sustained and continuous treatment.

The rehabilitation techniques applied interested the mandible and the soft parts of the face and neck.

The following methods and techniques were used:

- general massage of the head and neck;

- relaxing massage for muscle spasms control for: temporalis, masseter, medial and lateral pterigoid, suprahyoids, infrahyoids, digastric;
- techniques for detecting and treating trigger points on the face, head and neck;
- •passive and active stretching exercises lowering of the mandible, side movements, protrusion and retraction
- passive stretching exercises performed through specific movements of the trunk and neck;
- techniques of manipulating the mandible intra and extra oral;
- resistance exercises for opening and closing the mouth;
- posture corrective exercises of the head, neck and trunk;
- proprioceptive exercises of tmj;
- diaphragmatic breathing exercises for rehabilitation;
- swallowing rehabilitation exercises.
- active rehabilitation consists of three main stages:
 - rehabilitation through visual control of the patient;
 - rehabilitation of the patient without visual control, only by touch;
 - the execution of the movements without visual or tactile control, proprioceptive rehabilitation.

Results:

The patients included in the research followed kinetic treatment for three months, at the beginning more frequently due to the intensity of the symptoms, the rhythm decreasing while improving test indices..

The initial clinical examination revealed the existence of pain at the temporal-mandible joint level in all tested patients. The examination performed after three months reveals a decrease in pain intensity, increasing the number of patients presenting moderate and mild pain compared with the initial assessment when the patients had severe and moderate pain. In two tested patients there was no pain.

The pain is present on palpation at the external auditory canal, at the palpation of the pretragus, during chewing, at the mobilization of the mandible or jaw muscle palpation.

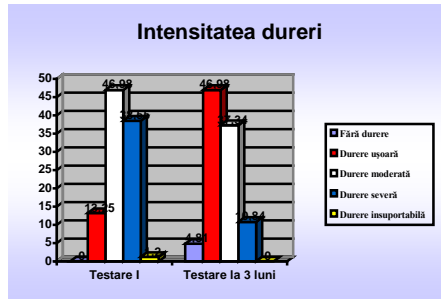


Fig.1 Pain evidence in tested patients

Figure 1 show that after three months of kinetic treatment the pain decreased, predominating in patients presenting mild and little pain. Extreme cases are not many, but the applied treatment may be the cause of these results. After three months of treatment there is a change in track indices, thus an increase in patients with pain that is caused to 75.90%, and less spontaneous to 18.05%, the predominating pain, somatic type to 97.59%. The appearance of pain as diurnal and nocturnal at the two tests, registered a decrease of 12.11% to the nocturnal and 2.41% to the diurnal.

At the initial assessment 50% of the analyzed cases complained noises at the level of the TMJ. With the basic stage of the disease more advanced there will be more frequent noises inside the joint. After three months of treatment it was revealed the decrease or even the absence of the joint noises during the execution of the movements such as: 27.71% from the patients being tested present noises at the mouth opening, 12.04% at the mouth closing, 8.43% at protrusion 3.61% at the retraction and 18.07% at the side movements.

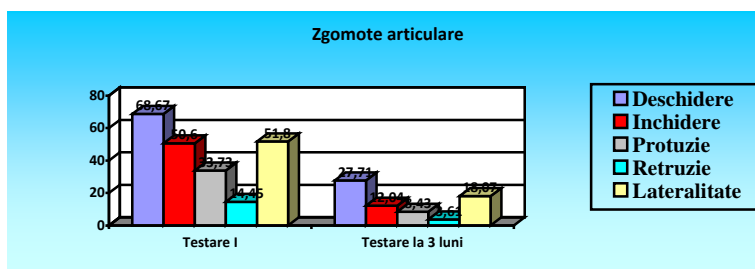


Fig.2. Joint noises

At the initial assessment the range of motion at the temporal-mandible on all movement axes is damaged to a variable percentage of patients: 15.38% movement of mouth opening,

29.9% at the side movement 29.9%, 21.15%- protrusion movement, 1.92% at the retraction movement. Limitation of the mandible mobility leads to diet restriction, the disruption of daily activities and the generation of abnormal social and family life. After three months of the application of the kinetic treatment the range of motion of the patients included in the research increased, the majority of the patients having values close by normal indices. This progress determines an increase of quality life in patients. The muscle testing was performed on masseter, temporalis, medial pterigoid and lateral pterigoid, digastric, sternocleidomastoideus and longus colli muscles and it looked for the presence of pain, spasm and atrophy.

TABLE II
Analysis of the ATM index

ATM INDEX	NO.	MED	Standard Deviation
Initial Testing	83	15.01	3391
Testing after 3 months	83	11	2798

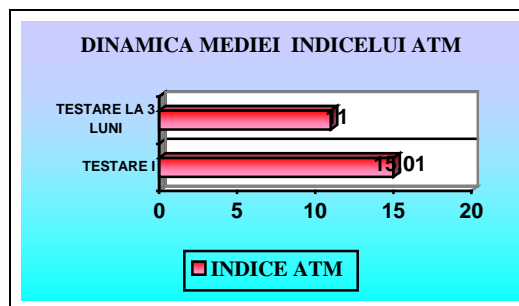


Figure 3 Evolution of the average of the ATM index

In assessing the differences between the average of indices, T-Test, it analyze the testing performed in two different times, registering the values as an average score for the patients who followed a kinetic treatment. The included tested values show that there are significant differences, statistically, between the two moments of testing; the significance value *t* is below 0.05 for each of the tested indices.

Discussion:

The kinetic therapy in the algo (painful)-dysfunctional syndrome of the temporal-mandible joint (TMJD) it directs to a functional rehabilitation aiming to improve the quality of life. In the current context in which the modern medicine emphasizes more and more the aspect of the assuring patient's comfort and quality of life, we estimated the relationships that can be established between the therapeutic solutions and the clinical-biological, socio-economical and psycho-behavioral parameters of the patient, also the subjective post-therapeutic feed-back are extremely important elements in the complex process of developing a treatment plan.

To achieve positive results, the recovery process of patients with algo (painful)-dysfunctional syndrome of the temporal-mandible joint was based on the interdisciplinary qualified cooperation (rheumatologist, dentist, kinetic therapist, physiotherapist and psychologist) on the one hand and on the other hand the possibilities for cooperation with the patient who need be involved in their own rehabilitation. The rehabilitation team is responsible to remove or improve as much as possible the morbidity status of an individual, to restore its capacity to live in an integrated manner, physically and psychosocially. The complex issues generated by the algo (painful)-dysfunctional syndrome of the temporal-mandible joint (TMJD) capture and attract the interest of practitioners and researchers in the field. So, I tried to find and bring new concepts regarding the application of the therapy through movement at temporal-mandible joint level.

Conclusions:

In order to provide an optimal therapeutic solution, we must analyze and synthesize information related to a number of data taken from the patient Medical Records file (medical history, clinical and functional laboratory tests).

The applied kinetic treatment depends on the quality of the communication therapist-patient, motivation, perseverance, and not the last, this being one of the most important issues in the recovery: the patient collaboration. The applied treatment should include clear objectives aiming benefits on short and long terms.

The kinetic recovery in the algo (painful)-dysfunctional temporal-mandible joint is a prerequisite for a proper mastication and includes stages of specific and non specific preparation.

The kinetic applied treatment methods justified through a functional rehabilitation to improve the quality of life of rheumatic patients with temporal-mandible joint dysfunction (TMJD).

The kinetic recovery for the included patients favored to obtain correct posture of the head, neck and trunk, the obtaining of a normal mastication deglutition and respiration, the increase of the range of motion and to overcome the neuromuscular imbalances.

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Titlu: Studiu privind eficiența aplicării metodelor kinetice la pacienții reumatici cu disfuncție temporo-mandibulară.

Cuvinte cheie: evaluarea funcțională, disfuncție temporomandibulară tratament, reabilitare.

Rezumat: Alegerea soluției terapeutice adecvate corelată cu un management terapeutic corespunzător constituie soluția ideală pentru obținerea unor rezultate superioare în tratarea sindromului algo-disfuncțional al articulației temporo-mandibulare. Studiul dorește să testeze anumite metode kinetice care pot determina diminuarea și combaterea simptomatologiei din sindromul algo-disfuncțional al articulației temporo-mandibulare.

Titre: Etude sur l'efficacité des méthodes cinétiques chez les patients rhumatismaux avec dysfonction temporo-mandibulaire.

Mots-cles : L'évaluation fonctionnelle, temporo-mandibulaire dysfonctionnement, le traitement, la readaptation.

Résumé: Choisir la solution de traitement approprié couplé avec prise en charge thérapeutique appropriée est la solution idéale pour atteindre des résultats supérieurs dans le traitement du syndrome algo-dysfonctionnel de l'articulation temporo-mandibulaire. L'étude vise à tester des méthodes cinétiques qui peuvent causer des symptômes de réduction et de contrôle de algo-dysfonctionnel syndrome de l'ATM.