

# Impact of Ibuprofen Medication and Prosthetic Esthetical Treatment in Elderly Patients with Temporal Mandibular Joint Disorders and Depression

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*Affections of temporomandibular joint (TMJ) can lead to imbalances and disfunctions named temporomandibular disorders (TMDs). Elderly people with TMDs are experiencing more severe phenomena due to instability centric relationship, edentation, hypotonia, and cranio-mandibular malrelations, neurologic and chronic diseases. The aim of this study is to investigate the efficiency of the anti-inflammatory treatment followed by prosthetic, esthetic and gnathologic treatment in elderly. This is a prospective study, based on data obtained from 410 elderly people, 74 female and 33 male gender subjects. In the studied group we found a high prevalence of pain (42.99%) and articular affection (25.23%) which is due both to the grade of edentation and to complications of it, also the muscular affection, headache, modification of the cranio-mandibular relations, psychological affection. The prevalence of depressive manifestations was high (35.51%) and after the ibuprofen treatment in association with prosthetic treatment was completed decreased (at 23.36%) in the elderly subjects. In conclusion, the anti-inflammatory treatment followed by prosthetic treatment and also esthetical one determined the improved outcomes of the TMDs in elderly patients, not only in terms of pain and depression but also clinically, meaning at the TMJ function and in all the intraoral and facial aspects.*

**Keywords:** public health, dysfunctional syndrome of stomatognathic system (SDSS), the temporal-mandibular joint (TMJ), prosthetic treatment, temporomandibular disorders (TMDs)

Population aging is an undeniable fact people aged over 65 representing 10-15% of the population for most of the European countries [1]. In Romania, the demographic data on 1 January 2012 showed that the share of persons aged 60 years and over was 21% of the total population. The geriatric population increase and their specific pathology explain the high consumption of medical services and medicines registered in the last 10 years [2].

Temporal-mandibular disorders (TMDs) has been described as a cluster of disorders characterized by pain in the preauricular area, in the jaw and face, masticatory muscles and other muscles of the head and neck, limitation or deviations in mandibular range of motion, and clicking of the TMJ during mandibular function [3]. Elderly people are experiencing more severe phenomena due to instability centric relationship, edentation, hypotonia, and cranio-mandibular altered relationships, neurologic and chronic diseases [3]. Affections of TMJ can lead to imbalances and disfunctions named algo-dysfunctional syndrome (SDSS). A person is considered to have a temporal-mandibular disorder only if pain or limitation of motion is enough severe to make them seek professional care.

## Experimental part

Iasi County had, at 1 January 2016, 919,049 inhabitants, of which 19.8% were people aged 60 and over (60+). Extrapolating the prevalence of TMJ affections (code K 07.6 in the International Classification of Diseases ICD-10, 2013), this population would result in an estimated number of 48,313 elderly people affected by this pathology, only in Iasi County [4]. Therefore, the scientific interest in elderly TMJ disorders and the consideration of this pathology as

the priority public health issue in dentistry, which requires special attention from professionals in the field, is justified.

## Aim and objective of the study

The aim of this study is to investigate the efficiency of the anti-inflammatory drug treatment (fig. 1) vs. Prosthetic esthetical and gnathologic treatment of the TMJ disorder in elderly patients. One of the affections that we will take into consideration in this study is the temporal-mandibular arthrosis, which is, in fact, the most frequent pathology at this level in the elderly patients, and to which we will measure the pain before and after the administration of the anti-inflammatory therapy. To relieve pain and inflammation of the TMJ and muscles was used ibuprofen (fig. 1). Ibuprofen is a non-steroidal analgesic and antipyretic anti-inflammatory drug and anti-platelet; is recommended for mild and moderate pain. It is administered orally, analgesic 200-1000 mg per day; as anti-inflammatory 1200-2400 mg daily, divided into 3-4 outlets.

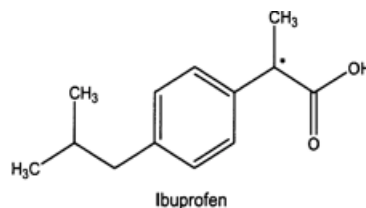


Fig. 1. Chemical formula for Ibuprofen

## Materials and methods

This is a prospective study, based on data obtained from 410 elderly persons, between 01.01.2016 and 31.11.2017 from Iasi County, who were addressed at two private dental offices and at the Mihail Kogalniceanu Clinical Education

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Base, of Iasi.

We lost from the study, 7 (1.71%) elderly people by changing their domicile (5 persons) or death (2 persons), the final response rate being 98.29%. The studied group involved 403 elderly people (161 men and 242 women). Of these, 107 elderly people aged 60-79 years (mean age:  $68.72 \pm 8.37$  years) were diagnosed with TMDs: 74 female and 33 male subjects.

Data concerning physical and mental health were retrieved from patients with painful TMDs according to the research diagnostic criteria [5].

*The inclusion criteria* for the patients in our study were: all patients had to have experienced pain complaints in the temporal-mandibular region, the presence of muscular tonus and muscular contraction alterations, muscular dysfunction (pain at the level of stomatognathic system and cephalic extremity, limitation of mouth opening, and deviation of mandible from the medial line during the opening, fatigue of cephalic extremity muscles and functional alteration of stomatognathic system). Participants admitted or keeping follow-up appointments were also included.

*The exclusion criteria* of the patients were represented by the presence of TMJ affliction, trauma [6, 7], rheumatoid arthritis [8] and neoplasm [9, 10]. Exclusion criteria were also: refuse of the patient to participate, uncooperative patients or those who did not respect the prescribed treatment.

We start the evaluation with the questionnaires for: a) subjective symptoms of TMD [5, 11]; b) pain (Graded Pain Scale, version 2.0) [11-13]; c) depression [14, 15].

The elderly patients answered at questions related to TMDs symptoms, which afforded a classification of each subject regarding the presence and severity of such dysfunctions [11]. For this study there were taken into consideration the symptoms of the patients, which determined their addressing to the doctor. *Symptoms Questionnaire of TMJ disorders* were assessed according to the 1-4 Likert scale which has: 1 = no symptoms, 2 = mild TMJ changes (such as TMJ sounds, feeling of fatigue in the jaws, and feeling of stiffness in the jaws on awakening or on movement of the lower jaw), type 3 = moderate TMJ changes (like difficulties in opening the mouth wide) and type 4 = severe TMJ changes (such as locking, subluxations, pain on movement of the lower jaw, pain in the region of the mandible or in the muscles in the last 30 days).

Nowadays, it is recognized that pain is influenced by a dynamic interaction between physical, psychological and social factors. The most common TMD symptom is the pain, which appears in front of the ear or near to it, with propagation towards the cheeks, neck or shoulder. In elderly people, the TMJ chronic pain is disabling and can impair cognitive functions such as concentration and memory, disrupt the sleep cycle, produce changes in personality, lead to a decrease in activities of daily living and stop people to participate in social activities [16].

Depression is defined as a state of low mood and aversion to activity which have a negative effect on a person's thoughts, behavior, feelings and sense of well-being [17].

Geriatric Depression Scale (GDS) - is a depression screening test for the elderly persons [18]. It is a simple test in which the elderly (with and without a history of depression) has to answer (affirmative/ negative) to a set of questions that explore the presence of symptoms that occur to depressed people. Over 5 scores indicating the presence of depression, and a score above 11 requires a specialist assessment. We mention that the diagnosis of depression in the elderly remains a problem because often

the symptoms are masked, negated by the patient or entourage, there are frequent somatization of the disease or cognitive disorder as its main manifestation [14, 15].

The second step of our study was a TMJ objective examination for clinical signs and a muscular examination. Diagnostic of TMD are based on a standardized clinical examination [5].

All 107 elderly patients were introduced in the Mihail Kogalniceanu Clinical Education Base, of Iasi for prosthetic esthetical and gnathologic treatment. The methodology of clinical and paraclinical examination was applied, including the TMJ and occlusion examination, as well as TMJ tomography. An objective examination of the TMJ has been realized by inspection, palpation and auscultation. Pretragical areas are static and dynamical examined, both of the TMJs, firstly separate and then simultaneously for comparison. Any static or dynamic deformation of the unilateral or bilateral pretragical area has been registered both, in mandibular rest or in occlusion and movement. During the articular examination, the patient was ordered to execute closing movements, opening movements, aperture movements, laterality, protrusion with a frequency that shall not be tiring and which permits the careful observation. The presence of clicks in the TMJ during opening and closing of the mouth was observed with the aid of a stethoscope placed near the external ear [5].

The examination of the muscles is made by inspection and palpation in order to determine the painful points and the irradiation areas. Any painful areas, trigger areas with determinations at distance, as they are noted in the observation paper, circumscribing the painful area at direct palpation, trigger area, irradiation area. The examination of the muscles in dynamic aims to detect the pain provoked by contraction, symmetric and equal participation in the realization of the mandibular dynamic.

In our study, we administered antiinflammatories frequently used in the TMJ treatment as ibuprofen 800-1200 mg/day, according to recent studies, for a period of 7 days (maximum 14 days). For all patients, we used the lowest effective dose and shortest treatment duration to control the symptoms.

### Variables

In our study, the demographic and socio-economic factors, considered as *independent variables* was: age, gender (male/female), social environment (rural/urban), marital status and the personal monthly income.

As *dependent variables* has been taken: the general health indicators (pain and depression), the symptoms of TMJ disorders, the results of objective examination for clinical signs and a muscular examination and the use of dental prosthesis.

The *statistical analysis* was performed with the SPSS software package for Windows [19]. The obtained data allowed for the classification of patients with respect to gender distribution, age groups, area of origin, clinical aspects, type of treatment instituted and appreciation of pain and depression.

To assess the significance of the identified differences we performed the Chi-squared test (Pearson  $\chi^2$ );  $p$  values  $\leq 0.05$  were considered to be statistically significant [20, 21].

Patients were informed about the study and the content of the questionnaire. When patients were willing to participate, they were requested to fill an informed consent. The study was approved by Institutional Committee of Research Ethics.

## Results and discussions

### General characteristics

In our study were included 107 elderly patients: 74 (69.16%) female and 33 (30.84%) male gender (fig. 2). The elderly patients are divided depending on the social

environment. Thus, in our study there were 58 (54.21%) patients from the rural area and 49 (45.79%) patients from the urban area (fig. 3). Thereby, we classified the elderly patients on age groups (table 1).

Fig. 2. Gender distribution

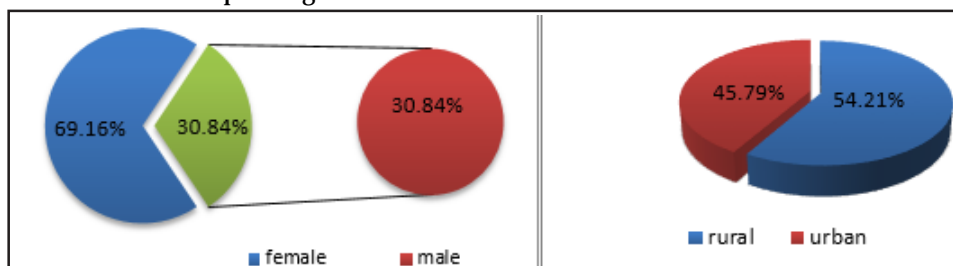


Fig. 3. Distribution based on social environment

**Table 1**  
GENERAL CHARACTERISTICS OF STUDIED GROUP

Variables:	Age: Gender:	60-79 years						Pearson's $\chi^2$			
		Male		Female		Total		$\chi^2_c$	Degrees of freedom	p value	Statistical Significance
		n <sub>1</sub>	(%)	n <sub>2</sub>	(%)	N	(%)				
<b>Social environment:</b>											
-urban;		14	28.57	35	71.43	49	45.79	31.421	1	0.0001	SS
-rural;		19	32.76	39	67.24	58	54.21				
<b>Personal monthly income:</b>								2.461	4	0.651632	NS
-no income;		1	3.03	4	5.41	5	4.67				
-poor (less than 80 €/month);		6	18.18	15	20.27	21	19.63				
-low income (81-120€/month);		9	27.27	23	31.08	32	29.91				
-lower middle income (121-220€/ month);		8	24.24	21	28.38	29	27.10				
-middle income (221€/month- medium income on economy- 525€/month).		9	27.27	11	14.86	20	18.69				
<b>Marital status:</b>								8.996	5	0.109223	NS
-unknown;		1	3.03	1	1.35	2	1.87				
-not married;		1	3.03	3	4.05	4	3.74				
-widower;		7	21.21	18	24.32	25	23.36				
-divorced;		5	15.15	17	22.97	22	20.56				
-currently married;		14	42.42	34	45.95	48	44.86				
-consensual union.		5	15.15	1	1.35	6	5.61				
<b>Age groups:</b>								0.327	3	0.95487	NS
-60-64 years;		7	21.21	13	17.57	20	18.69				
-65-69 years;		10	30.30	26	35.14	36	33.64				
-70-74 years;		11	33.33	24	32.43	35	32.71				
-75-79 years.		5	15.15	11	14.86	16	14.95				

**Table 2**  
SYMPTOMATOLOGY OF TMJ DISORDERS IN ELDERLY- BEFORE TREATMENT

Variables:	Age: Gender:	60-79 years						Pearson's $\chi^2$			
		Male		Female		Total		$\chi^2_c$	Degrees of freedom	p value	Statistical Significance
		n <sub>1</sub>	(%)	n <sub>2</sub>	(%)	N	(%)				
<b>TMJ presence:</b>								1.83	1	0.176127	NS
-absent;		113	77.40	183	71.21	296	73.45				
-present.		33	22.60	74	28.79	107	26.55				
<b>TMJ severity</b>								0.292	2	0.864157	NS
-mild TMJ changes;		21	63.63	43	58.11	64	59.81				
-moderate TMJ changes;		10	30.30	26	35.14	36	33.64				
-severe TMJ changes.		2	6.07	5	6.76	7	6.55				
<b>Graded Pain Scale (version 2.0, 2013):</b>								0.806	4	0.937641	NS
-pain free mouth opening;		18	54.54	43	58.11	61	57.01				
-mild;		7	21.21	11	14.86	18	16.82				
-moderate;		5	15.15	14	18.92	19	17.76				
-severe;		2	6.07	4	5.41	6	5.61				
-non-response.		1	3.03	2	2.70	3	2.80				
<b>TMJ pain detected at palpation by examiner:</b>								0.006	1	0.938257	NS
-no;		23	69.70	51	69.92	74	69.16				
-yes.		10	30.30	23	31.08	33	30.84				
<b>Headache attributed to TMJ:</b>								1.065	2	0.587135	NS
-absent;		21	63.63	52	70.27	73	68.22				
-present;		12	36.37	21	28.38	33	30.84				
-non-response.		0	0	1	1.35	1	0.93				
<b>Articular affection:</b>								0.633	4	0.959326	NS
-current TMJ noises during mouth open&close:		9	27.27	18	24.32	27	25.23				
-click detected by examiner;		5	15.15	11	14.86	16	14.95				
-crepitus detected by examiner;		3	9.09	6	8.11	9	8.41				
-at least one TMJ sound reported by patient;		2	6.07	5	6.76	7	6.55				
-subluxation of the TMJ;		13	39.39	21	28.39	34	31.78				
-luxation of the TMJ;		2	6.07	3	4.05	5	4.67				
-TMJ blockage.		1	3.03	3	4.05	4	3.74				
<b>Pain in masticatory muscle(s):</b>								4.879	2	0.087204	NS
-pain reported by patient;		10	30.30	25	33.78	35	32.71				
-detected at muscle palpation by examiner:		5	15.15	9	12.16	14	13.08				
-masticatory muscles;		3	9.09	5	6.76	8	7.48				
-cervical muscles.		2	6.07	4	5.41	6	5.61				
<b>Mouth opening:</b>								0.021	1	0.884778	NS
-normal (35-40 mm);		25	75.76	57	77.03	82	76.64				
-limited (<35 mm).		8	24.24	17	22.97	25	23.36				
<b>Modifications of the occlusion:</b>								0.127	2	0.938474	NS
-modifications of the dynamic occlusion;		9	27.27	18	24.32	27	25.23				
-modifications of the static occlusion.		15	45.45	34	45.95	49	45.79				
<b>The cranial-mandibular relations:</b>								3.157	3	0.368046	NS
-extraposture malrelation;		1	3.03	5	6.76	6	5.61				
-excentric malrelation;		2	6.07	8	10.81	10	9.35				
-mixt malrelation.		8	24.24	25	33.78	33	30.84				
<b>Mobility in the TMJ:</b>								0.932	1	0.334343	NS
-absent;		22	66.67	42	65.76	64	59.81				
-present.		11	33.33	32	43.24	43	40.19				
<b>Depression (GDS):</b>								0.126	1	0.722615	NS
-nonraspuns;		1	3.03	3	4.05	4	3.74				
-absent;		21	63.63	44	59.46	65	60.75				
-present- from wich:		11	33.33	27	36.47	38	35.51				
-mild depressive mood;		8	24.24	20	27.03	28	24.30				
-medium depressive mood.		3	9.09	7	9.46	10	9.35				



**Table 3**  
SYMPTOMATOLOGY OF TMJ DISORDERS IN ELDERLY- AFTER TREATMENT

Variables:	Age: Gender:	60-79 years						Pearson's $\chi^2$			
		Male		Female		Total		$\chi^2$	Degrees of freedom	p value	Statistical Significance
		n <sub>1</sub>	(%)	n <sub>2</sub>	(%)	N	(%)				
<b>TMJ presence:</b>											
-absent:		113	77.40	183	71.21	296	73.45	1.83	1	0.176127	NS
-present:		33	22.60	74	28.79	107	26.55				
<b>TMJ severity:</b>											
-mild TMJ changes:		26	78.78	56	75.68	82	76.64	0.229	2	0.891811	NS
-moderate TMJ changes:		5	15.15	14	18.92	19	17.76				
-severe TMJ changes:		2	6.07	4	5.40	6	5.60				
<b>Graded Pain Scale (version 2.0, 2013):</b>											
-pain free mouth opening:		22	66.67	49	66.22	71	66.36	0.806	4	0.937641	NS
-mild:		5	15.15	13	17.57	18	9.35				
-moderate:		4	12.12	8	10.81	12	12.21				
-severe:		1	3.03	3	4.05	4	3.74				
-non-response:		1	3.03	1	1.35	2	1.87				
<b>TMJ pain detected at palpation by examiner:</b>											
-no:		26	78.78	63	85.14	89	83.18	0.657	1	0.417621	NS
-yes:		7	21.22	11	14.86	18	16.82				
<b>Headache attributed to TMD:</b>											
-absent:		28	84.85	64	86.49	92	85.98	0.609	2	0.737492	NS
-present:		5	15.15	9	12.16	14	13.08				
-non-response:		0	0.0	1	1.35	1	0.94				
<b>Articular affection:</b>											
-current TMJ noises during mouth open&close:		7	21.21	13	17.57	20	18.69	1.458	4	0.834054	NS
-click detected by examiner:		3	9.09	8	10.81	11	10.28				
-crepitus detected by examiner:		2	6.07	4	5.40	6	5.60				
-at least one TMJ sound reported by patient:		1	3.03	4	5.40	5	4.62				
-subluxation of the TMJ:		7	21.22	15	20.27	22	20.56				
-luxation of the TMJ:		2	6.07	2	2.70	4	3.74				
-TMJ blockage:		1	3.03	2	2.70	3	2.80				
<b>Pain in masticatory muscle(s):</b>											
-pain reported by patient:		5	15.15	11	14.86	16	15.89	0.001	1	0.974728	NS
-detected at muscle palpation by examiner:		4	12.12	7	9.46	11	10.28				
-masticatory muscles:		3	9.09	4	5.40	7	6.54				
-cervical muscles:		1	3.03	3	4.05	4	3.74				
<b>Mouth opening:</b>											
-normal (35-40 mm):		27	81.82	61	82.43	88	82.24	0.006	1	0.938257	NS
-limited (<35 mm):		6	18.18	13	17.57	19	17.76				
<b>Modifications of the occlusion:</b>											
-modifications of the dynamic occlusion:		5	15.15	9	12.16	14	13.08	0.219	2	0.896282	NS
-modifications of the static occlusion:		7	21.22	15	20.27	22	20.56				
<b>The crano-mandibular relations:</b>											
-extraposture malrelation:		1	3.03	3	4.05	4	3.74	2.941	3	0.400811	NS
-excentric malrelation:		1	3.03	5	6.76	6	5.60				
-mixt malrelation:		5	15.15	16	21.62	21	19.63				
<b>Mobility in the TMJ:</b>											
-absent:		24	72.73	52	70.27	76	71.03	0.067	1	0.795755	NS
-present:		9	27.27	22	29.73	31	28.97				
<b>Depression (GDS):</b>											
-nonraspsuns:		1	3.03	2	2.70	3	2.80	0.118	1	0.731213	NS
-absent:		25	75.76	54	72.97	79	73.83				
-present- from wich:		7	21.22	18	24.32	25	23.36				
-mild depressive mood:		4	12.12	11	14.86	15	14.02				
-medium depressive mood:		3	9.09	7	9.46	10	9.35				

The calculated prevalence of TMDs was 26.55% in the studied group: 20.49% in male and 30.58% in female gender (between the two gender being a statistically significant difference,  $\chi^2 = 5.039$ , GL=1, p=0.024782), the gender ratio being F/M=74/33= 2.24/1 (tables 2,3).

Making a proper medical history of the elderly patient we revealed that a history of local infection is present in 9.35% (10) of patients, osteoporosis 19.63% (21) of the cases, depression in 9.35% (10) of the cases and arthritis in 10.28% (11) of the cases (fig. 4).

*TMD symptomatology* in elderly patients before versus after treatment was presented in figure 5.

The holistic vision, the unitary, systemic conception, supports the dis-homeostatic theory in the generation of TMDs, the idea of the conjugate action of triggering factors. Thus, we describe the factors: articular, muscular, dental, periodontal and functional [16].

It is a disorder of the temporal-mandibular articulation, which frequently determines patients to ask for treatment, because the elderly persons usually do not realize the existence of the crackles or other functional disorders.

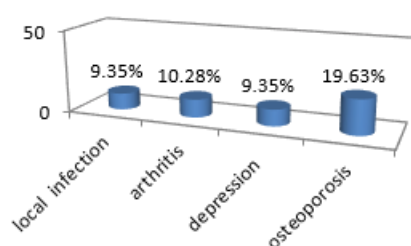


Fig. 4. Personal pathological antecedents- in elderly patients

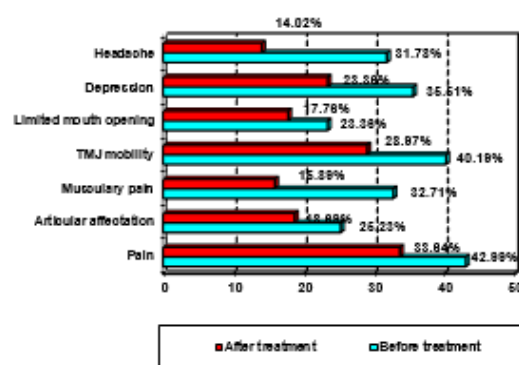


Fig. 5. TMDs symptomatology prevalence in the elderly patients- before and after treatment

#### *Pain and the TMJ affection*

Pain and TMJ function disorder reflect intra-articular problems. In the studied group (table 2 and 3), we found a high prevalence of *pain* (42.99%) and *articular affection* (25.23%), which is due both to grade of edentation (complications of it) and the chaotic, uncoordinated, functioning of the stomatognathic muscle system, especially of the external pterygoid. Articular pain is of variable intensity, starting with dull vivid pains, up to real uni- or bilateral pain, it appears at rest and can be exacerbated in motion, usually in the morning, disappearing after a few moves. It can also appear after lunch, as a result of the fatigue and joint solicitation.

After the treatment with Ibuprofen it can be noted, in male gender, a decrease (from 27.27 to 21.21%) in the prevalence of articular affection, but it is statistically insignificant ( $\chi^2 = 0.42$ , GL=4, p=0.980806). After

treatment with Ibuprofen in female gender subjects is also a decrease (from 24.32% to 17.57%) in the prevalence of joint damage, but it is statistically insignificant ( $\chi^2_c=0.414$ , GL=4,  $p=0.981314$ ).

#### Headache attributed to TMJ disorders

In male gender subjects, after a treatment with Ibuprofen, it can be noted a decrease (from 36.37% to 15.15%) of headache prevalence attributed to TMDs, it is a statistically significant decrease ( $\chi^2_c=3.882$ , GL=1,  $p=0.0488063$ ). Similarly to female gender subjects, was observed a decrease (from 28.38% to 12.16%) of the TMDs headache prevalence attributable to Ibuprofen treatment, statistically significant also ( $\chi^2_c=6.041$ , GL=2,  $p=0.048776$ ).

#### The muscular pain and affectionation

Signs and muscular symptoms are predominant in the clinical table, in elderly patients being almost impossible to clearly establish the cause of the signs and symptoms, such as TMJ pathology or as a consequence of edentulous.

In our study, the prevalence of pain in masticatory muscles reported by elderly patients was high (32.71%).

After treatment with Ibuprofen, it can be noted a decrease (from 15.15 to 12.12%) in the prevalence of muscle pain reported by elderly male patients, statistically insignificant ( $\chi^2_c=0.94$ , GL=1,  $p=0.332277$ ). Also, at female gender elderly subjects, after treatment with Ibuprofen, there was a decrease (from 12.16% to 9.46%) in the prevalence of muscle pain reported by the patient, it was a statistically significant decrease ( $\chi^2_c=7.194$ , GL=1,  $p=0.007314$ ).

The clear influence could be studied after prosthetic estetical and gnathologic treatment, when the influence would remain only in patients with TMDs. Affectionation of the muscular factor, important milestone in the correctitude of the cranial-mandibular fundamental relations will implicitly generate the installation of cranial-mandibular relations.

#### Psychologically affectionation

Patients with persistent TMDs problems may suffer psychologically and socially because of pain and dysfunction [22]. Failed treatments and recurrent pain episodes contribute to stresses with a pattern of frustration and even depression [23].

At the beginning of our study, the prevalence of depressive manifestations was higher (33.33%), statistically significant ( $\chi^2_c=4.486$ , GL=1,  $p=0.034173$ ) in elderly males subjects with TMDs versus those without TMDs clinically manifest (20.18%). After treatment with Ibuprofen followed by prosthetic estetical treatment, TMDs prevalence decreased to 21.22% [OR=1.9452, CI 95%=(0.6422-5.8946),  $p=0.2393$ ], the risk attributable to depression being  $Ar=48.59\%$ .

At the beginning of our study, the prevalence of depressive manifestations was high (36.47%) and in elderly women with TMDs versus those without TMDs (28.48%), but it was statistically insignificant ( $\chi^2_c=2.258$ , GL=1,  $p=0.132925$ ). After treatment with Ibuprofen followed by prosthetic estetical and gnathologic treatment, TMDs prevalence decreased (at 24.32%), [OR=1.1702, CI95%=(0.6269-2.1844),  $p=0.6216$ ], the risk attributable to depression being in this case low,  $Ar=14.54\%$ .

We mention that muscular pain is the symptom that most commonly associates with depression, leading to a vicious circle by which one causes it then maintains the other.

#### Modification of the cranial-mandibular relations

The relationship between TMD and malocclusion is an extremely critical issue in dentistry. Elderly people are the most affected group of altered cranio-mandibular relationships.

In male gender group, was observed a significant decrease in the prevalence of modifications of occlusion after treatment with Ibuprofen followed by prosthetic treatment ( $\chi^2_c=8.852$ , GL=2,  $p=0.011962$ ). And in female gender, there was a significant decrease in the prevalence of modifications of occlusion after treatment with Ibuprofen followed by prosthetic treatment ( $\chi^2_c=21.256$ , GL=2,  $p=0.000024$ ) increase the occlusion criteria.

The cranio-mandibular relationships can be altered as a result of action, frequently simultaneous and conjugated, of risk factors that can be correlated with stomatologic system elements. This situation can also occur due to the hypotonicity of the *mosquito muscles*, a phenomenon especially encountered in elderly peoples with neurological and/or chronic diseases.

The disturbance of tone and muscle contraction will in time involve articular, odontal, periodontal stress, all aggravating the altered cranio-mandibular relationships.

Examination of the centric relation has a major impact in establishing the diagnosis of the stomatognathic system's dysfunctions. Interarch reports registered in centric relation will serve to detect the premature contacts (where applicable) in centric relation or at fitting models in the simulator.

Modification of the main functions: masticatory, deglutition, physiognomic, phonetic and latching occurs in the whole group of patients, each patient being total or subtotal edentulous, showing damage physiognomy, a self-maintaining circuit, speaking problems, masticatory issues or dysphagia for liquids and solids.

In case of dynamic occlusion the testing movement is realized, testing position with contact at the level of all the incisors (normal) and a distal occlusion (Cristhensen sagittal). It is observed the way in which dynamic occlusion is in compliance with mandibular dynamic, articular dynamic or muscular contraction [28].

Another variable taken into consideration is *the articular mobility*, and the third obvious sign are the crackles produced when using the articulation, which can be heard by the patient and also by the ones around him, but which are not significant in the absence of the pain and articular immobility.

In our study, after Ibuprofen treatment, from the mobility point of view, articular hypermobility can be found in 31 (28.97%) elderly patients, which is much more frequent than the limitation of the mandible movements, which is present in 19 (17.76%) patients (fig. 6). Between the two parameters it is a statistically significant difference ( $\chi^2_c=3.758$ , GL=1,  $p=0.05$ ).

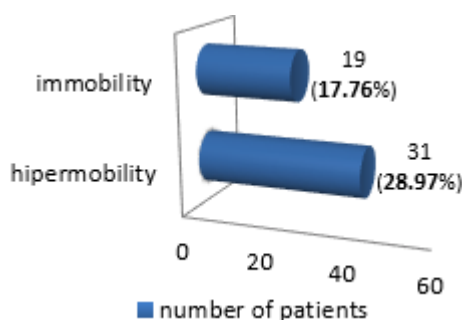


Fig. 6. Mobility in the TMJ

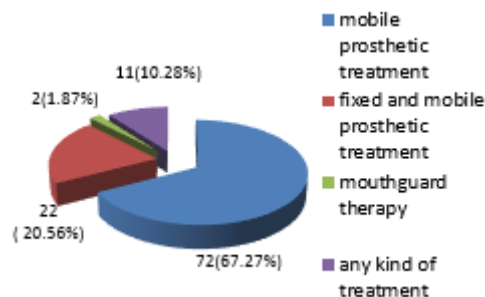


Fig. 7. The prosthetic and gnathologic treatment of the elderly patients

They were questioned and evaluated after treatment about the pain threshold according to VAS (Visual Analogue Scale) [8]. The effect of Ibuprofen is moderate at this time.

The last evaluation was conducted after prosthetic treatment completion. The effects of the anti-inflammatories were preserved throughout the time of administration, without any significant changes. It can also be mentioned that improved outcomes was not only in terms of pain but also in terms of clinical function of the TMJ [25, 26].

Another important parameter that we took into consideration was *the side effects of the anti-inflammatories*. They cause side effects including gastrointestinal (GI) disorders (from minor dyspepsia through to major ulcers and bleeding), kidney effects and cardiovascular effects.

In our study there were no usual side effects during the administration of any of the used drugs, with the condition of respecting the basic rules. In considering the risk associated with non-prescription use of the anti-inflammatories, it is important to consider three factors: safety at low doses, with short durations of treatment, and in populations with a low background risk of events [8].

Patients have been applied, simultaneously, different fix prosthetic treatments, mobile, as well as relaxation mouth guards (fig. 7), an improvement of the quality of life of these patients being registered, as it follows: in 67.29% were applied acrylic prostheses and in the rest, both fixed and mobile, in 2 (1.87%) cases being used the method of relaxation mouth guards. Only 11 patients (10.28%) reject any kind of prosthetic treatment.

At the facial level, the appearance of the teeth and oral cavity as a whole is of particular importance, and by its morphology and complexity of functions, its physical and psychological significance is the dominant facial element.

Psychiatric disorders are secondary to body shape changes (facial features, facet level, golden proportions and intraoral signs) due to the projection of one's own body morphology, which determines the degree of comfort of the individual in the report with the normal body composition.

Intraoral signs of edentation no longer correspond to the normal image created by inducing confusion that can cause psychological imbalance or depression [27].

## Conclusions

Our study found a high prevalence of TMD, considering the geriatric population studied and the results of other studies.

The improved health outcomes of the elderly patients was not only in terms of pain and depression but also clinically, meaning at the TMJ function.

In elderly patients, the noninvasive therapies are clearly preferred for most TMDs problems.

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