

TEMPORO-MANDIBULAR MANIFESTATION AN IMPORTANT ISSUE IN REHABILITATION TREATMENT PLAN AT PATIENTS WITH OBESITY PATOLOGY AND STRESS DISORDERS.- clinical and paraclinical examination part 1-

Laura Elisabeta Checheriță¹⁺, Norina Consuela Forna²⁺, Liana Aminov^{1*}, Bogdan Mihaila³⁺, Toma Vasilica⁴⁺, Veronica Serban- Pintiliciuc^{4*}, Antonela Maria Beldiman²⁺, Ovidiu Stamatin²

¹ Department of Odontology, Periodontology and Fixed Prosthesis, Faculty of Dental Medicine, Grigore T. Popa University of Medicine and Pharmacy, 16 Universității Street, 700115, Iasi, Romania. ; e-mail: checherita.laura@gmail.com (C.L.E.)lianaaminov@umfiasi.ro(L.A.)

² Oral-Implantology, Dental Prostheses Technology and Removable Dentures, Faculty of Dental Medicine, Grigore T. Popa University of Medicine and Pharmacy, 16 Universității Street, 700115, Iasi, Romania ;profforna@gmail.com(N.C.F.)ovidustamatin@yahoo.com(O.S)

³ Public Health and Management Department, Faculty of Dental Medicine, Grigore T. Popa University of Medicine and Pharmacy, 16 Universității Street, 700115, Iasi, Romania;bogdanmihaila@yahoo.com(B.M.)

⁴ Pedodontics Departaments ,Faculty of Dental Medicine, Grigore T. Popa University of Medicine and Pharmacy, 16 Universitatii Street, 700115, Iasi, Romania,tomavasilica@yahoo.com(T.V.) and veronica.serban@umfiasi.com(V.S.P.)

Correspondence authors : Liana Aminov (L.A.):liana.aminov@umfiasi.ro

Veronica Serban Pintiliciuc(V.S.P) : veronica.serban-pintiliciuc@umfiasi.ro

+These authors have the same scientific contribution,equal, with the first author .

Abstract

The complex oral rehabilitation team should be aware of the link between an imbalanced TMJ, edentation, occlusion, and an increased caries risk after eating a high-carb diet. Prevention of obesity and metabolic diseases is critical for this population. Co-occurring diseases like as type 2 diabetes may impact periodontal health management, and erosion risk may increase due to reflux, and the following complex stress disorders pathology .

Keywords: stress , temporomandibular joint , temporomandibular disorders obesity , treatment. complex oral rehabilitation ,social condition, dental care management ,oral health

Introduction. Defined as an unusual or excessive fat buildup that could be harmful to one's health people. Body mass index (BMI), which is commonly used in healthcare settings, is a typical approach to measure body fat based on height and weight. A BMI of greater than 30 is regarded as obesity [1-2]. An individual's tendency to become obese is favored by lower socio-economic position, stress disorders ,psychological and mental health issues, and some drugs like steroids and antidepressants that can alter appetite are a few examples of these. Furthermore, those with physical disabilities could find it more difficult to exercise, and less common causes of obesity

include endocrinopathies (like Cushing's illness), genetic disorders, and hypothalamic diseases (like Prader-Willi syndrome)[3-4]. Dental teams need to be aware of the correlation between a high-carb diet and a higher caries rate when treating patients, as evidenced by studies published in dental journals.For this population group, prevention is crucial, and this includes fluoridated toothpaste, dietary recommendations, and teaching on proper oral hygiene [5-7].

*Aspects to take into account when offering dental care ;*With a few small changes, conventional dentistry may safely treat many obese individuals Although it might not be

immediately clear where anatomical landmarks are for intraoral radiography or local anesthetic injections, this can be addressed with effective soft tissue retraction utilizing tools like a tongue retractor. When treating an obese patient who had carries or dental treatment including edentation may have breathing difficulties when placed in a supine position for dental treatment, adjustments and the patient/ or operator arrangement may also be necessary. Co-morbid conditions like type 2 diabetes will affect periodontal care, and reflux may cause erosion to occur more frequently. Patients with non-alcoholic fatty liver disease may have bleeding irregularities and delayed healing in addition to a weakened immune system [8-10].

Aim of the study .Demonstrating the unstable condition at the loco-regional and intraoral levels, particularly in the articular-TMJ area in patients who are obese and under stress. Also, the dysfunctional syndrome (DSSS) alterations brought on by stress and overwork that are not related to the development of caries , and subsequent dental complications

Methodology. Out of the 45 patients who were seen in the dental clinic in the Prosthodontics-Gnatology department at UMF Gr. T. Popa Iasi, we included 22 patients for this study. These patients had diabetes and a BMI index that was within normal ranges, but they could not be classified as obese. As a result, the majority are between the ages of 22 and 32; there are stressful circumstances; most are students or novices in trades; necessary training with erratic schedules; nervous consumption; and poor nutrition, particularly in regards to sweets. In this regards on methodology the BMI index is important , BMI level in this study, including the normal weight group: $18.5 \leq \text{BMI} < 25$, overweight group: $25 \leq \text{BMI} < 30$, obesity group: $\text{BMI} \geq 30$, control group: $\text{BMI} < 25$, and overweight and obesity group: $\text{BMI} \geq 25$. The clinical assessment of the oral status, perioral on TMJ from patients with TMDs, and not only, regards the identification of intraoral arch disharmonies, the nature of muscular

hyperactivity at manducatory muscle , or hipotonicity on the oyher side (obesity disese)and the presence of symptoms of TMDs. perioral on TMJ in patients with TMDs, as well as other aspects, such as the presence of symptoms, the nature of muscular hyperactivity at the manducatory muscle, the identification of intraoral arch disharmonies, or hipotonicity on the other side (obesity disease). The importance of *paraclinical methods*, model study, radiographs,TMj investigation , like a good diagnostic and a correlation between the intraoral parameters for a rehabilitation complex treatment. We used the **DASS 21** stress questionnaire(Fig 1) , it should not be used to replace a face to face clinical interview just complete it , follow its degree and applied and after 3 months of rehabilitation treatment with splints ,unidental and rarely pluridental prosthesis max 2elements , occlusal adaptation , or physiokinetotherapy medication myorelaxant , accompanied by diet and stress management program. Responses being queried by stress questionnaire after 3 or 6 six months. This type of questionnaire is a tool used to assess sources of stress in dental students. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty in relaxing, nervous excitement and being easily upset/agitated, irritable/hyperreactive and anxious. Depression, anxiety and stress scores are calculated by summing the scores for the relevant item.

The set of blood tests that certify the general status of the patient, being able to identify even better ways of treatment that can accompany and stabilize the clinical situation. we also need at the same time to perform general physiotherapy exercises not only loco regional that can be performed without some risk. we are also trying to restore the posture, which has a direct connection with the situation at TMJ level, and thus we are interested in the general status and then the loco-regional situation that comes in addition to the local dental one. Management of the doctor's working method is

practiced with precaution of these cases with obesity, being a little permissive and much more difficult from most points of view. *Ethics and registration* .Our research was approved by the Ethics Committee of “Grigore

T. Popa” University of Medicine and Pharmacy, Iasi, TD 312/2008, and No. 176/17.04.2022. All protocols were in accordance with provisions of the Declaration of Helsinki.

Stress	Score
Normal	0-14
Mild	15-18
Moderate	19-25
Severe	26-33
Extremely Severe	34+

Fig.1 The DASS-21 for stress should not be used to replace a face to face clinical interview.

Lovibond, S.H. & Lovibond, P.F. (1995)[11-14].

Exemplificatory for our research we chose , the next case ;

1) Subjective clinical examination

Patient data

Name: First name:K I Age:22 Gender: masculin Profession:student.Address: France,Lyon ; Anamnesis: gastroesophageal reflux disease, glucide intolerantion,,obesity. Reason for presentation presentation: TMJ—temporomandibular joint -disorder following interdisciplinary consultation in the clinical examination program in Gnatology Prosthetic discipline in UMF Gr. T. Popa Iasi. Personal general physiological and pathological

history: social and and family stress . Personal dental history: none,Family general history mother diabetes typ 1, hypertension obesity typ 1,BMI 25 father lung cancer , obesity type 2 ,BMI 30, brother obesity type 1 - 25 BMI , grandfather obesity type IBMI 30 ,lung cancer; Living and working conditions: irregular meal , familial stress ,intrelectual stress . Alcohol consumption:no Drug consumption:no declaration,coffee consumption .



Fig.1 Posture ,face, profile clinical case aspects , blood tests .

2) Objective clinical examination General

Patient Comments :Height:1.68 Weight:13 (IBM 30(134/1.68))4. Psychic state:balanced ;Head and body posture status:little modified forword .Psychic behavior: normal in apearence(after the day stands with the discussion over his mental and derulle the discution, considering stress .



Fig .2 a, b ,c, Examination of the face – anthropometric measurements.(Modified Leonardo Da Vinci method, Boianov and Willis method.Compare the superior ,middle floor dimension and lower floor ; middle floor Measurements SubNasal – Nasion = 55 mm.floor measurement: Ophrion – SubNasal = 55mm;measurement of the lower oral floor: SuNasal – Gnathion = 56mm.)

1)Face Inspection: Symmetry Assessment: Boianov method Compare distance Cheilon – Cheilon and Stomion distance – Nation Measurement of Ch – Ch = 53mm Measurement of St – Gn = 53mm.

Inspection of the face: Assessment of symmetry: modified boianov method Compare the distance Inter-pupillary with distance



Fig.3.a,b,c,d,e .Deep palpation ,bone contours, manducatory muscle groups .

1) ATM examination: Statique: Inspection (front and side) normal. Pretragian regions = modification absent; Chin position = Normal .

3) Local objective clinical examination of extraoral aspects

The extraoral examination includes the following steps: 1) Inspection of the face (Figure 2a,b,c,); 2) Profile inspection; 3) Superficial palpation of the skin; 4) Deep palpation; 5) ATM Review;

1)Inspection of the face .

Stomion–Gnation Interpupillary distance measurement =54 mm Measurement of St – Gn =54 mm.

2)Profile inspection: Nasolabial angle = 85° The goniac angle =140 ° Lip ratio = normal

3)Superficial palpation of the skin: Evaluation of tactile sensitivity using a compress, we symmetrically appreciate a change in sensitivity while stroking-normal . Temperature and humidity: Normal

4)Deep palpation bone contours: Integrates ,continue ;not painful.

Trigeminal points: no special sensitivity;; Muscle groups: not painful on palpation;hypertonicity external pterigoidian , temporal right and maseter right also, hypotonicity on temporal left.

The symmetry of the face is respected.Palpation Pre-tragyal regions = Sensitivity absent. Chin compression = Sensitivity absent (Fig. 4).



Fig. 4. TMJ clinical examination .

Dynamic Inspection: Methodology used: Is done by asking the patient to open and close the mouth by evaluating the trajectory movements of the chin excursion: Chin excursion (from profile and face) Front: on the midline .Profile: convex forward ,discontinuous excursion.

Dynamic Inspection + Palpation Method used - Simultaneous inspection and palpation to obtain all the information about the condylar excursion Pretragic region ; Condylar excursion •aynergic •asymmetric• inequal amplitude .

4)Local Objective Clinical.Intra-Oral Examination :

Examination of the oral orifice -Lip texture (by palpation) = Normal • Lip contour= Symmetrical • Lip height=4mm -L.sup- St= 2,3mm -L.inf-St= 3,4mm • Cupid's bow= flat • Filter of upper lip= normal • Cleft lip= closed, length • Amplitude of opening= 40mm,normal • Absence of any pathological changes.

Ch,right,left downposition –disposition clinical sign.

Examination of the labio-jugal mucosa: •Integrity= Integral• Coloration= Normal •Joint line= Absent •Stenon Canal= Normal (normal saliva) •Fordyce's corpuscle= Absent —> Absence of any pathological lesions.

Intraoral of the maxillary clinical aspects (Fig 5).

Examination of the maxillary vestibule • Absence of any modifications • Alveolo-Jugal fold = straight = short, thin, single, with a base of medium implantation, with a medium insertion in relation to the top of the ridge. left= short, thin, single, with a base of medium implantation, with a medium insertion in relation to the top of the crest. Upper labial frenulum = long, thick, medium implantation base, with a low insertion relative to the top of the ridge. —> **the vestibule is free without formations pathological.**



Fig. 5 Intraoral of the maxillary clinical aspects.

Maxillary intra-oral aspects.Examination of the dento-alveolar arch maxillary. The maxillary arch describes a shape: semi- ellipse, symmetrical. Condition of the remaining teeth

= Integral but (2.8 infroclussion). Caries present in retentive molar zone – pigmentation ,periodontal aspects gingivitis simple ,GI =1,localized lateral area .

Mandibular intraoral aspects Examination of the mandibular vestibule normal. Normal • Alveolo-Jugal fold = straight = short, fine, single, with a medium implantation base, with a medium insertion in relation to the top of the ridge. left = short, thin, single, medium implantation base, with medium insertion from the top of the ridge. • Lower labial frenulum = medium length, thin, with medium implantation base, with medium insertion in relation to the top of the ridge. —> **the vestibule is free without formations pathological**

Intra-Oral Mandibular: Examination of the dento-alveolar arch .The Mandibular arch describes a shape: semi-ellipse, symmetrical. Condition of the remaining teeth- Integra(missing the 3.8 anclavation

,4.8anodontie). Caries present in retentive molar zone 3.7 and 4.7,periodontal aspects gingivitis simple ,GI =1,localized frontal and lateral area .

INTRA-ORAL STATIC occlusion parameter

I.Occlusal parameters: 1. Occlusal area: - Maxilla:continouse , shorted(2.8 missing) ;Mandibular: continouse , shorted(4.8 3.8 missing) 2. Curve of Spee shorted :3. Wilson curve normal : 4. Frontal curvature:normal : 5. Support Cusps:normal cuspidation 6. Guiding Cusps: normal cuspidation, 7. Anterior guidance: normal 8. Occlusal plane: Present (Fig 6).

II.Angle Key-Overbite Accentuated $\frac{1}{2}$ Incisor Landmark Vertical Plane .



Fig.6 Static parameter of occlusion and Angle key,occlusogramme-maximale intecuspidyand centric relation .

Dynamic occlusion parameter • Examination of protruding contacts. Test position: 2.1 22. 3.1 and 11 1.2 with 4.1,4.2Propulsion movement continouse No presence of interference; sagittal Christensen phenomenon normal ;

Laterality right – lateral ghidance,in test position ; lateral Christensen phenomenon present.

Laterality left – canin ghidance,in test position ; lateral Christensen phenomenon present (Fig.7).



Fig.7 Dynamic occlusion-protrusion laterality aspects .

4) LOCAL OBJECTIVE CLINICAL EXAMINATION MANDIBULO-CRANIAL RELATIONS

PR • Articular landmark= Condyles centered in the glenoid cavity • Muscular Mark= Balanced contraction masticatory muscles. • Bone Marker = Levels of levels • Tooth mark= Headroom, 2.6mm • Labial marker= in contact without effort. • Lingual Mark= Donders space present

CR —> induced by the Ramfjorde method • Articular landmark= Condyles deep in the glenoid cavity • Muscle Mark= Contraction balanced masticatory muscles(hypertonicity on external pterygoid and maseter right). • Bone Marker = Levels of levels-equal - • Tooth mark = multiple (Fig.8).



Fig.8 Clinical examination- centric and posture relation, landmarks.

5) PARACLINICAL EXAMINATION RADIOGRAPHY:

Orthopantomographycal and TMJ EVALUATION also model study are the princitpal modaliteis to investigate our pacient and make corelation with the clinical examination (Fig.9).



Fig.9 Paraclinical Examination : Orthopantomography and TMJ tomography .

Results and Discution .We are able to detach from the context of the clinical examination, following an explicit evaluation carried out according to the standard protocol for examining the stymatognathic system, which

targets the intra-oral extra-oral and loco-regional area, as an important phase of correlation and detection of intra-oral and loco signs -regional at the oro-maxillo-facial level with the application of advanced paraclinical

examinations, both local and loco-regional , to anticipate a local and loco-regional diagnosis of the relevant general pathology and on a favorable and optimal direction of complete rehabilitation within the existing pathology of approach at patients with stress obesity and algodysfunctional syndrom manifestation.

obesity and stress [15-21].

Conclusion All surrounded data, it offers us a good predictability in the context of the complex oral rehabilitation

References

1. National Institute for Health and Care Research. Research to examine role dentists can play in tackling obesity crisis. 31 January 2022. Available at: <https://www.nihr.ac.uk/news/research-to-examine-role-dentists-can-play-in-tackling-obesity-crisis/29808> (accessed November 2022).
2. Holland, C. Obesity, oral health and the role of the dental profession. *Br Dent J* **233**, 712–713 (2022). <https://doi.org/10.1038/s41415-022-5242->
3. Chandahas Deshpande N, Rajendrakumar Amrutiya M. Obesity and oral health - Is there a link? An observational study. *J Indian Soc Periodontol* 2017; 21: 229-233.
4. HM Government. Healthy Lives, Healthy People. A call to action on obesity in England. 2011. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213720/dh_130487.pdf (accessed November 2022).
5. Large J F, O'Keefe E, Valentine C, Roebuck E M. Weight screening in paediatric dentistry: What do families and staff think? *Int J Paediatr Dent* 2022; **32 Suppl 1**: 64-66
6. British Society of Paediatric Dentistry. Position Statements. Available at: <https://www.bspd.co.uk/Professionals/Resources/Position-Statements> (accessed November 2022).
7. Troeltzsch M, Troeltzsch M, Cronin RJ, Brodine AH, Frankenberger R, Messlinger K. Prevalence and association of headaches, temporomandibular joint disorders, and occlusal interferences. *J Prosthet Dent*, 2011; 105(6):410-7.
8. Von Piekartz H, Lütke K. Effect of treatment of temporomandibular disorders (TMD) in patients with cervicogenic headache: a single-blind, randomized controlled study. *Cranio*, 2011; 29(1):43-56
9. Pihut M, Ferendiuk E, Szewczyk M, Kasprzyk K, Wieckiewicz M. The efficiency of botulinum toxin type A for the treatment of masseter muscle pain in patients with temporo-mandibular joint dysfunction and tension-type headache. *J Headache Pain*, 2016; 17: 1– 6.
10. Rigon M, Pereira LM, Bortoluzzi MC, Loguercio AD, Ramos AL, Cardoso JR. Arthroscopy for temporomandibular disorders. *Cochrane Database Syst Rev*, 2011; 5: CD006385.
11. Lovibond, P. F., & Lovibond, S. H. (1995). *Depression Anxiety and Stress Scales (DASS-42)* [Database record]. APA PsycTests.
12. Lovibond, S.H. & Lovibond, P.F. (1995). *Manual for the Depression Anxiety Stress Scales*. (2nd. Ed.) Sydney: Psychology Foundatio
13. Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*, 33(3), 335-34
14. Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British journal of clinical psychology*, 44(2), 227-239.
15. Ferrillo M, Migliario M, Marotta N, et al. Temporomandibular disorders and neck pain in primary headache patients: a retrospective machine learning study. *Acta Odontol Scand*. 2023;81(2):151–7.
16. Marotta N, Ferrillo M, Demeco A, Drago Ferrante V, Inzitari MT, Pellegrino R, Pino I, Russo I, de Sire A, Ammendolia A. Effects of radial extracorporeal shock wave therapy in reducing pain in patients with temporomandibular disorders: a pilot randomized controlled trial. *Appl Sci*. 2022;12(8):3821. <https://doi.org/10.3390/app12083821>.
17. Wadhokar OC, Patil DS. Current trends in the management of temporomandibular joint dysfunction: a review. *Cureus*. 2022;14(9): e29314

18. Jordani PC, Campi LB, Braidó GVV, et al. Obesity, sedentarism and TMD-pain in adolescents. *J Oral Rehabil.* 2019;46(5):460–7.
19. T, Leung CW. Associations between perceived stress and BMI and waist circumference in Chinese adults: data from the 2015 China Health and Nutrition Survey. *Public Health Nutr.* 2021;24(15):4965–74.
20. Bremner JD, Moazzami K, Wittbrodt MT, et al. Diet, stress and mental health. *Nutrients.* 2020;12(8):2428.
21. Fernandez-de-Las-Penas C, Von Piekartz H. Clinical reasoning for the examination and physical therapy treatment of Temporomandibular Disorders (TMD): a narrative literature review. *J Clin Med.* 2020;9(11):3686.