
DENTAL PROSTHETICS AND TEMPOROMANDIBULAR DISORDERS

Boris Borisov¹, Elena Dimova²

¹*Department of Dental Material Science and Propaedeutics of Prosthetic Dental Medicine,
Faculty of Dental Medicine, Medical University of Varna*

²*Department of Pediatric Dentistry,
Faculty of Dental Medicine, Medical University of Varna*

ABSTRACT

Introduction: Edentulism, especially in the support areas, as well as pathological tooth wear (abrasion and attrition) of the hard dental tissues leads to a decrease in occlusal height and posterior translocation of the articular heads in central occlusion. Partial and complete edentulousness of patients disturbs their occlusal, phonetic function, as well as aesthetics.

Aim: The aim of the present study is to investigate the relationship between the type of prosthetic treatment and temporomandibular joint (TMJ) complaints.

Materials and Methods: A total of 152 patients who visited the Faculty of Dental Medicine at the Medical University of Varna and underwent prosthetic treatment were examined. The patients were evenly distributed by sex and age. They have been clinically examined and interviewed.

Results: Slightly more than half of the patients underwent prosthetic treatment with partial dentures (53.9%), the rest—with complete dentures. Sex dependence was not established while, in terms of age, it was determined that the mean age was 64.5 years for patients treated with complete dentures and 57.2 years for partial dentures ($p < 0.001$). There was a significant difference in the type of dentures and complaints related to TMJ dysfunction ($p = 0.030$), finding that the likelihood of TMJ dysfunction in patients with complete dentures increased more than twice (OR = 2.124 (1.030–4.381); $p < 0.05$).

Conclusion: The probability of TMJ dysfunction in patients with complete dentures is much higher than in those treated with partial dentures. Regardless of the type of the dentures, females are more prone to TMJ complaints.

Keywords: *temporomandibular joint dysfunction, TMJ, dental prosthetics, dentures*

Address for correspondence:

Boris Borisov
Faculty of Dental Medicine
Medical University of Varna
84 Tzar Osvoboditel Blvd
9002 Varna
e-mail: doctor_bb@abv.bg

Received: 2022

Accepted: 2022

INTRODUCTION

Edentulism, especially in the support areas, as well as pathological tooth wear (abrasion and attrition) of the hard dental tissues leads to a decrease in occlusal height and posterior translocation of the articular heads in central occlusion. Partial and complete edentulousness of patients disturbs their occlusal, phonetic function, as well as aesthetics.

Temporomandibular disorders (TMDs) is a collective term used to demonstrate a number of dysfunctions, including the temporomandibular joints (TMJ), the masticatory muscles, and related structures (1,2).

The functional disorders of the temporomandibular joint often manifest as acute or chronic pain in the joint area and/or in the masticatory muscles (3). Impaired dynamics of mandibular movements manifests itself as limited or increased range of the jaws, deviations in the course of movement and adduction of the lower jaw and lack of symmetry in the lateral movements of the lower jaw (2). Acoustic symptoms such as popping or clicking sounds may also be present, as evidenced by a lack of coordination between the articular head and the articular discs during movement of the lower jaw.

AIM

The aim of the present study is to investigate the relation between the type of prosthetic treatment and temporomandibular joint complaints.

MATERIALS AND METHODS

We studied 152 patients who visited the Faculty of Dental Medicine at the Medical University of Varna and had prosthetic treatment. The patients were evenly distributed by sex and age. They have been clinically examined and interviewed.

A detailed ambulatory card created for the purpose of the study was completed for each patient. It included information about name, sex, age, concomitant diseases (diabetes, joint diseases), reasons for visiting the dentist's office, reasons for the need for prosthetic treatment, reasons for tooth loss, parafunctions (bruxism, bruxomania), TMJ condition (pain, clicking, trismus). The study was conducted after obtaining approval by the Commission for Scientific Research Ethics at Medical University of Varna, decision № 100 from a meeting on 25.02.2021. All study participants signed an informed consent.

The results were processed with SPSS v. 20.0, using the following analyses: dispersion analysis, variation analysis, correlation analysis, regression analysis, risk assessment analysis—odds ratio (OR), comparative analysis, as well as a graphical method for displaying the obtained results.

RESULTS

Slightly more than half of the patients underwent prosthetic treatment with partial dentures (53.9%), while the rest underwent treatment with complete dentures (Fig. 1).

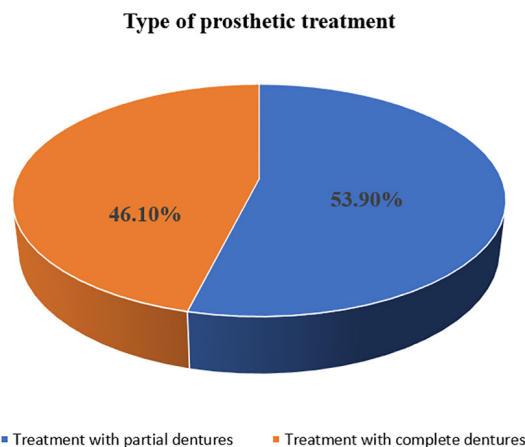


Fig. 1. Distribution of patients according to the type of prosthetic treatment.

Sex dependence was not established while, in terms of age, it was determined that the mean age was 64.5 years for patients treated with complete dentures and 57.2 years for partial dentures ($p < 0.001$) (Fig. 2).

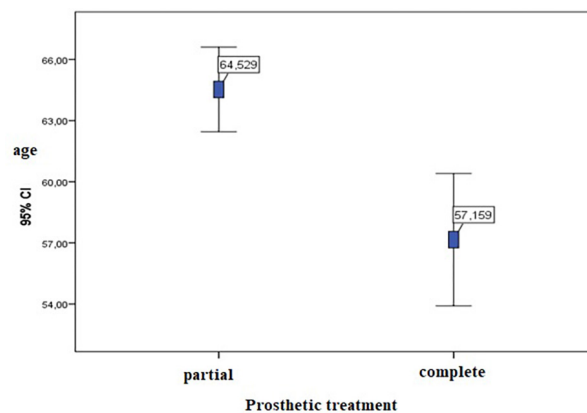


Fig. 2. Mean age of patients according to the performed prosthetic treatment.

Of the patients studied, only 5.9% were diagnosed with bruxism, with a predominance of women (66.7%).

The majority of patients with TMD were symptomatic, with a predominance of female patients (66.7%). Complaints were less common in men. Men without complaints were more than those with complaints (39.10%/33.30%) (Fig. 3).

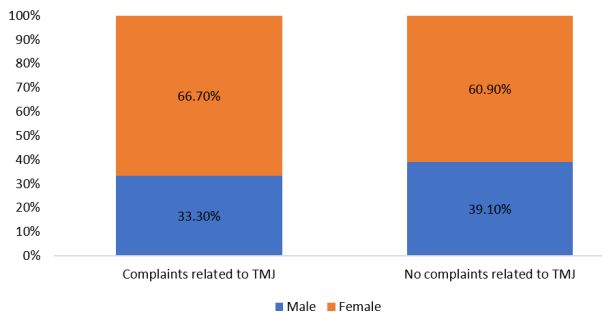


Fig. 3. Distribution of patients according to TMJ complaints and sex.

There was a significant difference in the type of dentures and complaints related to TMJ dysfunction ($p = 0.030$), finding that the likelihood of TMJ dysfunction in patients with complete dentures increased more than twice ($OR = 2.124 (1.030-4.381)$; $p < 0.05$) (Fig. 4).

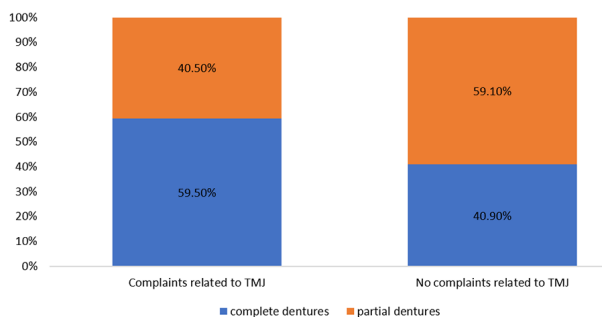


Fig. 4. Distribution of patients according to the complaints related to TMJ and the type of dentures.

DISCUSSION

The etiology of temporomandibular dysfunction remains unclear. The most possible causes are related to occlusal dysfunction and psychological distress (4,5). Intracapsular inflammation (arthritis) or injury and muscle pain or spasm can be caused by improper occlusion, parafunctions, stress, anxiety or joint disc disorders (6).

The incidence of TMJ disorders is from 10 to 15% in the general population and is most common in the age group of 20–40 years and twice as common in women, which was confirmed by our study (2,3). Approximately 60 to 70% of the general population suffers from at least one symptom of TMD, but only 1 in 4 patients is aware of the signs of the disease and reports them.

Occlusal parafunctions are responsible for hyperactivity of the masticatory muscles. The contractures of these muscles, arising from pathological motor habits, move the disc forward and lead to the posterior position of the articular heads. Most patients report an association between ear pain and muscle disorders (2).

The need for prosthetic treatment with complete dentures increases with age (mean age is 64.5 years). This is confirmed not only by our research but also by a number of other author groups (7). The need for partial prosthetics is present at a slightly younger age (mean age 57.2 years).

In totally edentulous patients, TMJ-related complaints are more common than in partial edentulousness. The explanation of this result stems from the fact that because of the total edentulousness the height of the occlusion changes, which affects the functioning of the temporomandibular joint.

CONCLUSION

The probability of TMJ dysfunction in patients with total dentures is much higher than in those treated with partial dentures. Regardless of the type of the dentures, females are more prone to TMJ complaints.

REFERENCES

- Gopinath B, McMahon CM, Rochtchina E, Karpa MJ, Mitchell P. Risk factors and impacts of incident tinnitus in older adults. *Ann Epidemiol.* 2010;20(2):129–35. doi: 10.1016/j.annepidem.2009.09.002.
- Okeson JP, de Leeuw R. Differential diagnosis of temporomandibular disorders and other orofacial pain disorders. *Dent Clin North Am.* 2011;55(1):105–20. doi: 10.1016/j.cden.2010.08.007.
- Von Korff M, Ormel J, Keefe FJ, Dworkin SF. Grading the severity of chronic pain. *Pain.* 2017;50(2):133–49. doi: 10.1016/0304-3959(92)90154-4.

-
4. Ferrari R, Russell AS. Epidemiology of whiplash: an international dilemma. *Ann Rheum Dis.* 1999;58(1):1-5. doi: 10.1136/ard.58.1.1.
 5. Reynolds P, Gardner D, Lee R. Tinnitus and psychological morbidity: a cross-sectional study to investigate psychological morbidity in tinnitus patients and its relationship with severity of symptoms and illness perceptions. *Clin Otolaryngol Allied Sci.* 2004;29(6):628-34. doi: 10.1111/j.1365-2273.2004.00879.x.
 6. Adler RH. Engel's biopsychosocial model is still relevant today. *J Psychosom Res.* 2009;67(6):607-11. doi: 10.1016/j.jpsychores.2009.08.008.
 7. Chen YF, Yang YH, Chen JH, Lee HE, Lin YC, Ebinger J, et al. The impact of complete dentures on the oral health-related quality of life among the elderly. *J Dent Sci.* 2012;7(3):289-95. doi: 10.1016/j.jds.2012.06.004.