



Nutritional problems in rheumatoid arthritis patients with temporomandibular joint involvement

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Abstract

Rheumatoid arthritis (RA) is an inflammatory arthritis that affects synovial joints, and it is not surprising that the temporomandibular joint (TMJ), a synovial joint, is also affected. However, TMJ is rarely the first affected joint in the course of RA. Often, RA patients come to the physician with more focus on complaints in other peripheral joints. Therefore, asking TMJ complaints and symptoms, and TMJ examination in RA patients is often neglected by doctors too, because they focus more on other joints. This neglect may cause serious damage to the joints and cause disability. Examination of TMJs, which is a crucial component of vital activities such as nutrition and speech, should be added to the routine. Also, further studies may be focused on adding TMJ assessment to disease activity scales and health assessment questionnaires.

Keywords

Disability, malnutrition, obesity, rheumatoid arthritis, temporomandibular joint

Introduction

Temporomandibular joint (TMJ) is a synovial joint consisting of 4 articulated surfaces consisting of the glenoid fossa of the temporal bone, the upper and lower surfaces of the articular disc, and the mandibular condyle [1].

Since rheumatoid arthritis (RA) is an inflammatory arthritis that affects synovial joints, it is not surprising that TMJ is involved in the course of RA. TMJ involvement in patients with RA is not rare and approximately 50% to 75% of patients with RA have TMJ involvement during the course of the disease [2]. However, TMJ is rarely the first affected joint in the course of RA [3]. Pain is the most common complaint due to TMJ involvement in RA patients [4]. Limited mouth opening is another frequent complaint [4]. Frequently observed clinical findings are restrictions on daily activities such as eating, speaking, and swallowing in patients with symptoms such as pain, sensitivity, swelling, and limitations in jaw movements [5]. Furthermore, deep preauricular pain during the mouth opening and closing, the morning stiffness of



the jaw, and the tenderness during palpation of the jaw and the masticatory muscles are common [5]. Morning stiffness and weakness in masticatory muscles are also seen in TMJ involvement. TMJ is a crucial component of our vital activities such as nutrition and speech. As such, RA patients with TMJ involvement may have phonation and nutritional problems. In addition, about half of the RA patients (51.5%) complain of xerostomia that causes difficulties in swallowing and phonation, sensation of burning mouth, increased thirst, taste disorder and odor, and dental sensitivity [6]. All these can impact eating, drinking, and swallowing, resulting in oral-stage dysphagia [7, 8].

Nutrition

Gilheaney et al. [9] reported that 24.63% and 30.69% of RA patients with TMJ involvement experience impaired swallowing and mastication, respectively. Thus, the RA patients may avoid eating or they may consume a softer modified diet in order to reduce the exacerbation of pain and TMJ dysfunction, and to increase the ease of oral intake. Bessa-Nogueira et al. [10] reported the prevalence of diet modifications as 50.82%. This is a high ratio to be considered. This diet may not contain the needed nutrients, vitamins, and minerals and therefore may not be nutritionally optimal. Dietary choices can also show pro-inflammatory effects (for example red meat, salt, excessive caloric intake) or on the contrary reduce inflammation (oil, fatty fish, fruit, and others). For example, the Western diet, characterized by a high intake of red meat, saturated and trans fats, a low ratio of omega-3/omega-6 fatty acids, and high consumption of refined carbohydrates, has been associated with an increased RA inflammation, insulin-resistance, and obesity. The effects of vitamin A, C, E, selenium, and zinc on RA disease activity are controversial. However, the deficiencies of these antioxidant nutrients may be associated with the disease activity [11, 12]. However, it is well known that hypovitaminosis D is associated with RA disease progression [13]. The gut microbiota, which includes all common and potentially pathogenic bacteria found in the gastrointestinal system, has an important role in the immunological homeostasis of human, and the alteration of the microbiota may be associated with the pathogenesis of inflammatory diseases, including RA. Diet is an important factor affecting the microbiota composition and the alterations in gut microbiota and body composition changes are indirect mechanisms of how diet affects the onset and progression of RA [14]. As we know, body composition and weight changes are common in RA patients, and there may be elevated risks of malnutrition or obesity in patients with TMJ involvement [15]. TMJ involvement may result in weight loss and malnutrition, rheumatoid cachexia, and even obesity [16, 17].

Malnutrition leading to weight loss is highly prevalent in up to 71% of RA patients [18]. Also, low body mass index has been suggested as a crucial predictor of worse clinical outcomes, with negative implications on levels of muscle mass and joint destruction [19]. Therefore, malnutrition and weight loss may be contributing factors to increased morbidity and mortality in patients with RA, and a link between increased malnutrition and the presence of TMJ involvement can be hypothesized [19]. In RA patients, body composition of reduced muscle mass in the presence of stable or increased body fat is known as rheumatoid cachexia and this occurs in up to 67% of RA patients, and it is often associated with poor psychosocial and functional outcomes [20–22]. Significant weight loss may result in muscle atrophy, sarcopenia, osteoporosis, and reduced wound healing, with increased joint damage and dysfunction [23, 24]. In addition, consumption of modified softer diets may exacerbate the gastrointestinal motility problems often seen in patients with RA [25].

Obesity

There are conflicting debates regarding the contribution of obesity to the development of RA and the relative effects of levels of body fat on joint function. However, relations between higher levels of body fat in RA patients and coronary disease, endothelial dysfunction, insulin resistance, type 2 diabetes, and medication resistance are observed. Also, obesity decreases functional capacity and health-related quality of life while increases pain and inflammation [15]. Obese RA patients have a lower chance of remission and a lower chance of sustaining remission than non-obese patients [15]. It should not be forgotten that

glucocorticoids, which have an important place in the treatment of RA, also have the risk of inducing obesity. Chronic exposure to glucocorticoids is known to cause a cushingoid appearance and weight gain. Serious clinical features including altered body composition and the development of insulin resistance, impaired glucose tolerance, and diabetes are associated with glucocorticoid exposure. It has been hypothesized that these adverse effects are mediated by the direct effects of glucocorticoids on tissues such as fat or liver. That's why glucocorticoids are recommended as a short-term and quickly tapered-off treatment at the initial treatment of RA and sugar intake should be reduced especially in patients under glucocorticoid treatment [26]. However, it should be noted that these side effects are dose and duration related. A recent study found that in RA patients over 65 years of age, prednisolone treatment added at a low dose and continued for 2 years had long-term beneficial effects on disease activity and damage progression, with no serious side effects and with an acceptable increase in mild side effects [27]. Therefore, in light of these observations, it is evident that obesity due to a corrupted diet in RA patients with TMJ involvement may impact the disease activity and can cause multiple comorbid problems deteriorating the health-related quality of life.

TMJ involvement

Interestingly, despite all these possible serious problems related to TMJ involvement, RA patients often come to the physician with more focus on complaints in other peripheral joints and they do not complain of TMJ unless the physician asks. RA patients have a low awareness of the disorders related to TMJ [28]. This may be attributed to the fact that the patient does not know that the TMJ complaint may be caused by RA or that the involvement in the hand joints may disrupt the quality of life earlier and more significantly. Therefore, asking about TMJ complaints and symptoms, and TMJ examination in RA patients are often neglected by doctors too, because they focus more on other joints. This neglect may cause serious damage to the joints and cause disability [29]. In a study, it was reported that 85% of the rheumatologists admitted that they ignored TMJ involvement in RA [29]. TMJ is not taken into account when evaluating disease activity with commonly used measures like disease activity score with 28 joints (DAS28) [30]. Also, the assessment tools like health assessment questionnaire (HAQ), which is performed to evaluate the physical activity of RA patients, consist of the daily loss of function caused by peripheral joint involvement in the section about eating, but not the disability due to TMJ involvement [31].

In this context, we should keep in mind that the diagnosis of TMJ involvement is based on the history, physical findings, and radiographic findings. Magnetic resonance imaging (MRI) is the gold standard for detecting TMJ involvement. Synovitis, effusion in the joint, and the bony changes can be monitored in MRI [32]. Panoramic radiographs and cone beam computed tomography (CBCT) can be used to detect structural changes. Radiographic changes of TMJ include flattening of the mandibular condyle, cortical erosion, gradual reduction in joint space, deossification, condyle head deformity, and subcortical cysts [33, 34]. Again, in the advanced stages of the disease, a sharp and pointed condyle, osteophyte formation, lipping, shortened posterior ramus length causing premature posterior occlusion, anterior open bite, and deepening of the antegonial notch can be counted among the radiographic changes [32].

In RA patients with TMJ involvement, treating the RA and fighting with inflammation is the main treatment approach [32]. Malnutrition and obesity should be prevented by reviewing the diet according to the needs of the patient. Physical therapy, mobilization, stretching and strengthening exercises, and exercise to maintain neuromuscular control are the specific rehabilitative approaches for TMJ disorders [32, 35, 36]. Occlusal bite plates can be used to relax the joint [32]. Arthrocentesis, lavage, intraarticular injections, arthroscopic and arthrotomic interventions can be considered according to the stage of the disorders [32].

Conclusion

As physicians, our duty should be to keep the quality of life of RA patients at the highest level and to prevent deformity. Examination of TMJs, which is a crucial component of vital activities such as nutrition and

speech, should be added to the routine. Also, further studies may be focused on adding TMJ assessment to disease activity scales and health assessment questionnaires.

Abbreviations

TMJ: temporomandibular joint

RA: rheumatoid arthritis

Declarations

Author contributions

MI: Conceptualization, Investigation, Writing—original draft, Writing—review & editing. II: Conceptualization, Investigation, Writing—original draft, Writing—review & editing, Supervision. Both authors read and approved the submitted version.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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