Association between Diet and Xerostomia

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Xerostomia is defined as a subjective symptom of dry mouth, which may affect swallowing, chewing, taste perception and is the most important predictor in reduced oral health-related quality of life; also, xerostomia has been associated with nutritional changes. Xerostomia is a common condition of patients with autoimmune diseases; 50% or more patients with systemic lupus erythematosus, polymyositis/dermatomyositis or systemic scleroderma reported xerostomia. Sjogren's syndrome is one of the three most prevalent systemic autoimmune diseases and 98% of patients reported to have xerostomia. Although xerostomia is often claimed to lead to an impaired nutrition, there is lacking knowledge of which specific food groups associate with this condition. Therefore, our study examines the association between xerostomia and 23 diet items.

Keywords: xerostomia ; autoimmune diseases ; diet ; adults

1. Analysis on Research Results

Participants who reported a higher consumption of oils had less likelihood of xerostomia. There was evidence that plant-derived oils containing omega 3 fatty acids, mainly α-linolenic acid, may be valuable in the prevention and treatment of various health disorders [1]. A randomized placebo trial performed with patients suffering from Sjogren's syndrome demonstrated that both receiving wheat germ oil supplements (as placebo) and a supplement "n-3" including flaxseed oil and vitamin E contributed to an increased salivary flow. The authors discussed that the supplementation of plant-derived oils, presenting omega 3 fatty acids, may be beneficial for patients with autoimmune diseases to improve their dry mouth symptoms [2]. A cross-sectional study reported that patients with Sjogren's syndrome were deficient in the intake of omega 3 fatty acids [3]. This finding was in line with the results of another xerostomia-related study, where the intake of different fatty acids was tested, but only a deficiency in omega 3 fatty acids was significantly related to xerostomia [4]. On the other hand, in the bivariate analysis, we found that a more frequent use of cold-pressed oils was associated with xerostomia. This may be due to the fact that, in Lithuania, cold-pressed coconut oil is commonly used. A meta-analysis, published in 2020, reported that the use of coconut oil compared to non-tropical vegetable oils was significantly associated with a higher DL cholesterol and could be related with chronic diseases; thus, it may increase the risk of xerostomia [5]. Further research is needed to understand the role of different plant-derived cold-pressed oils and omega 3 fatty acids supplementation in the development and management of xerostomia and autoimmune diseases.

The lower use of carbohydrates was related to a higher likelihood of xerostomia. In addition to this, a significant bivariate association was found between xerostomia and the low consumption of bread. A similar study found that participants suffering from Sjogren's syndrome had a lower intake of bread compared to the control group [6]. The authors suggested that this may be due to the fact that starchy products are considered to be dry; thus, experiencing xerostomia patients avoided them. The lower intake of bread among participants with Sjogren's syndrome resulted in the overall deficiency of the intake of carbohydrates that subceeded below the recommendations [6]. More severe dry mouth symptoms were associated with a lower intake of whole grain products as indicated by the avoidance of certain carbohydrate-containing foods, such as cereal, rice, and pasta [7]. No association between xerostomia and other types of carbohydrates (except bread) was observed in the bivariate analysis. This may be related to cultural food preferences, as pasta and rice is not a part of the traditional Lithuanian cuisine. It is likely that patients having xerostomia tend to avoid using carbohydrate-rich food, which might result in a carbohydrate deficiency. In the case of a severe carbohydrate deficiency, saliva substitutes may benefit, as it is known that they improve the symptoms of dry mouth and increase swallowing ability [8]

A high-frequency consumption of lean and fat fish was related to xerostomia. This finding was in line with an earlier mentioned study, which found that patients suffering from Sjogren's syndrome tended to eat more fish than subjects in the control group [6]. The authors discussed that the smooth and viscous texture of fish as compared to meat may be better tolerated by patients with xerostomia, and those suffering from Sjogren's syndrome and other autoimmune diseases [6]. In support, our study found that a high proportion of participants having xerostomia reported a low consumption of processed

meat products. Additionally, a higher likelihood of xerostomia was observed for participants with a lower consumption of proteins. This may be explained by the preference of meat over fish in the traditional Lithuanian cuisine. More research may be warranted to examine the association between specific protein and xerostomia.

A high-frequency consumption of probiotic supplements was associated with xerostomia. In contrast, another cross-sectional study suggested that probiotics may lower the risk of xerostomia as their use increases salivation [9]. Gut dysbiosis was linked to several autoimmune diseases such as rheumatoid arthritis, systemic lupus erythematosus, Behcet's disease, and Sjogren's syndrome [10]. In addition, several studies associated Sjogren's syndrome with the antibiotics-induced gut dysbiosis [11]. Although we did not obtain a clear explanation, it may be that a higher consumption of probiotic supplements in the xerostomia group was due to the need to take them after an antibiotic treatment or in accordance with other conditions and symptoms related to gut dysbiosis. Therefore, this result of our study should be interpreted with caution and further research in this field is needed.

Overall, the current study showed that there was a substantial variation among our study participants concerning the consumption of 23 selected diet items. Seemingly, experiencing xerostomia did not limit the ability to eat various types of food. However, an avoidance of and preference for some specific food categories may result in an unbalanced diet. Therefore, patients with xerostomia could benefit from health and balanced diet advice as it is important in maintaining good health and preventing other health conditions. Special care should be taken to optimize the intake of high-quality carbohydrates, oils, and proteins. Patients with difficulties in consuming sufficient amounts of proteins could be advised to choose fish as an alternative to meat products, or salivary substitutes should be prescribed for improving the ability to swallow more dry food products. Probiotic supplements may be suggested for patients with xerostomia and gut dysbiosis-related condition, such as autoimmune diseases. In addition, our study did not find a significant relationship between xerostomia and the intake of important food groups, namely, vegetables and fruits, or dairy products. Therefore, in general, xerostomia may be compatible with the ability to maintain a balanced diet important for overall health.

2. Conclusions

An association between xerostomia and the consumption of six diet items—cold-pressed oils, lean and fat fish, bread, processed meat, and probiotic supplements—and three major diet groups—carbohydrates, proteins, and oils—was observed. Longitudinal studies are needed to validate the observed associations.

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