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Review Article

Nutritional challenges and dietary considerations in completely edentulous patients

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Abstract

Partial or complete Edentulism is highly prevalent among older adults and profoundly affects their nutritional status. When masticatory function is lost, especially due to the loss of posterior teeth, people avoid hard and fibrous foods such fresh fruits, vegetables, and lean meats. Reduced consumption of important macronutrients and micronutrients as a result of this dietary change raises the risk of sarcopenia, frailty, anaemia, and immunological impairment.
Oral anatomy and chewing function can be restored by prosthetic rehabilitation using complete dentures or implant-supported over dentures; nevertheless, research shows that nutritional results, including meal quality and biochemical markers, do not change in the absence of continuous dietary counseling. Despite statistical constraints brought on by brief follow-up periods, randomized trials show that combining dietary intervention with Prosthodontic treatment gives better result.
Edentulous people continuously exhibit decreased dietary diversity, lower intake of fruits, vegetables, and vital nutrients, and has greater rates of underweight status, according to observational studies and national surveys. Edentulism further restricts food options by being associated with xerostomia, dysphagia, and increased use of gastrointestinal medicines. Edentulism raises the risk of malnutrition in older persons and substantially reduces the quality of their food. Improving health outcomes in this susceptible group requires a multidisciplinary strategy that combines customized nutritional advice with prosthetic rehabilitation. This article provides a comprehensive review of the nutritional challenges encountered by completely edentulous older adults and emphasizes the benefits of a multidisciplinary approach in promoting healthier living.

Keywords: Edentulism, Complete denture, Implant supported over denture, Nutrition, Diet, Micro nutrients, Sarcopenia, Dietary counselling

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1. Introduction

A profound impact in nutrition seen in completely edentulous patients is mainly because of their diminished chewing efficiency. This in turn leads to deficiency of macronutrients such as protein, minerals like calcium and iron, and micronutrients like vitamins D and B-complex. Due to discomfort or difficulty chewing, edentulous patients usually avoid fibrous foods, such as fresh fruits, vegetables, and lean meats. This leads to dietary patterns that are poor in fibre, antioxidants, and high-quality protein. These dietary changes increases the risk of frailty, anaemia, sarcopenia, cardiovascular disease, and decreased immunity, all of which are serious health risks for older adults.[1]

Restoring oral architecture and chewing function is usually achieved using traditional complete dentures and implant-supported over dentures. Implant-supported over dentures have been demonstrated to improve biting force and patient satisfaction more than traditional complete dentures.[2] Nutritional outcomes, including meal intake and biochemical indicators, do not significantly differ between the two modalities in the absence of nutritional counseling,

The use of prostheses can help people regain masticatory function, and along with comprehensive nutrition counseling, it shows much better results than prosthetic rehabilitation alone. Clinical trials that combine customized dietary intervention with denture rehabilitation, for instance, have demonstrated improvements in body mass index and Mini dietary Assessment (MNA) scores, particularly when

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prosthodontists and dieticians collaborate. These studies emphasizes the importance of providing nutrition guidance along with prosthetic rehabilitation.[3]

2. Discussion

2.1. Diet and edentulism

Masticatory efficiency is severely compromised by edentulism, especially in elderly people who continue to wear outdated or ill-fitting dentures. Nearly fifty percent (47%) of edentulous seniors in one cross-sectional cohort had trouble chewing, which was linked to substantially decreased fruit and vegetable intake, especially among women who consumed less vitamin A, as well as a greater need for gastrointestinal drugs.[4]

Comparative research also demonstrates that people who are entirely edentulous are more likely to suffer from malnutrition; one study indicated that 21% of denture users were at risk, compared to 0% of dentate controls, and that their energy and vitamin intake had decreased.[5]

Multiple research has been done on the subject .Complete tooth loss was associated with considerably lower BMI and Mini Nutritional Assessment (MNA) scores in a study conducted by Kapil U et al; however, denture users had better nutritional profiles than those without prostheses, especially in terms of their consumption of energy, protein, calcium, and riboflavin.[6]

Evidence from southern Brazil shows that missing teeth are independently linked to reduced intake of macro and micronutrients; seniors who were edentulous had a greater rate of underweight (15.7%) than their dentate counterparts (6.2%).[7] Wu X et al , stated that reduced consumption of plant fats, iron, cereals, vegetables, and fruit was associated with poorer chewing performance as assessed by bite-force metrics or mixing tests; sarcopenia, dysphagia, and xerostomia are all consistently linked to compromised oral function, which further limits the variety of foods available.[8] By encouraging the eating of softer, nutrient-poor meals and discouraging the consumption of fibrous, protein-rich, and micronutrient-dense foods, edentulism disrupts dietary patterns. This leads to high risks of frailty and associated chronic illnesses in the elderly.

2.2. Prosthetic rehabilitation-clinical benefits and dietary limitations

Conventional dentures definitely increase chewing efficiency but elderly people with complete dentures find certain hard or fibrous items like nuts, apples, and meats difficult to chew .Many a times these food items fails to find a place in their diet after rehabilitation. Persistent shortages in important nutrients including fibre, calcium, and vitamins A and C are a result of this dietary limitation.[9] Measurable increase in bite force and patient satisfaction are possible with implant-supported over dentures, which give exceptional stability and retention.

The functional value of a denture can be diminished by a number of patient-related issues, including neuromuscular coordination, xerostomia, and concurrent cognitive or motor deficits, which limit many Prosthodontic therapies. Oral cleanliness, routine dental check-ups, and psychological adjustment are also essential for the long-term success of prostheses, particularly in older adults who are susceptible to cognitive or manual dexterity impairment.[10]

2.3. Effectiveness of dietary intervention

Numerous studies have demonstrated the importance of nutritional counseling as a supplement to Prosthodontic treatment, since it can improve nutritional biomarkers, diet quality, and general health results. Moynihan et al. conducted a major randomized controlled experiment to examine the impact of customized dietary recommendations in conjunction with new complete dentures on older persons. Only the group receiving nutritional counseling had a statistically significant increase in fruit and vegetable intake, as well as increases in the quality of protein taken, despite the fact that both the intervention and control groups reported increased chewing ability.[11] Another study by Vijaya et al. corroborated this conclusion, showing that over a three-month period, the combination of individualized nutritional instruction and denture rehabilitation improved Mini Nutritional Assessment (MNA) scores and produced moderate increases in body mass index (BMI).[12]

Despite these advantages there are a few challenges to the clinician .Long term adherence to the diet is possible only with consistent reinforcement. According to a review by Walls and Steele (2004), short-term treatments, most of the times does not result in noticeable or long-lasting improvements in the consumption of macronutrients, especially protein and good fats. Dietary patterns are also influenced by social position, cultural preferences, and physical constraints, which makes intervention efforts much more challenging.[13] A 12-month community-based program that combined dietician visits with Prosthodontic examinations significantly reduced the rates of malnutrition among edentulous elders in Japan, a country with a higher prevalence of integrated oral-nutritional interventions. When dieticians and dentists work together to design meals and make texture adjustments for patients who wear dentures, similar gains have been observed in nursing homes.

Contemporary research shows that personalised dietary interventions can improve the nutritional outcomes of older adults who wear dentures, especially when they are created and administered by qualified specialists. Sustained involvement, interdisciplinary cooperation, and consideration of socioeconomic and cultural aspects are also necessary factors.

3. Multidisciplinary Strategies for Nutritional Support

Addressing malnutrition in edentulous older person requires a coordinated, multidisciplinary strategy involving prosthodontists, dieticians, primary care physicians, and geriatric specialists. There is mounting evidence that older people experiencing tooth loss benefit from better health outcomes when clinical dental care is combined with nutritional assessment and dietary advice. Integrating nutritional assessment instruments, such as the Subjective Global Assessment (SGA) or Mini Nutritional Assessment (MNA), into standard Prosthodontic examinations is one successful strategy. By assisting doctors in early identification of patients at risk for under nutrition, these techniques facilitate prompt dietary intervention. Since edentulism and dental health are powerful indicators of low Body Mass Index (BMI), sarcopenia, and inadequate food intake, dentists are uniquely positioned to screen for malnutrition.[13]

When it comes to creating nutritional programs that are tailored to dental requirements, presence of a nutritionist can be a game changer. To help patients overcome chewing difficulties while ensuring proper nutrient intake, they can suggest texture-modified diets that contain nutrient-dense soft foods such cooked vegetables, dairy products, pureed lentils, and soft seafood. In order to facilitate swallowing and digesting, dieticians may also recommend moisture-enhancing food preparations and increased fluid consumption in situations of dry mouth (xerostomia), which frequently occur with denture use or use of certain medications.

Older adults, particularly those with frailty or edentulousness, should consume at least 30 kcal/kg/day of calories and 1.0–1.2 g/kg/day of protein (up to 1.5 g/kg/day if unwell or has sarcopenia), according to guidelines from the European Society for Clinical Nutrition and Metabolism (ESPEN). Under the guidance of medical specialists, edentulous individuals may be unable to achieve these goals through food alone, leading to the usage of oral nutritional supplements (ONS) or protein-fortified snacks.[12]

In order to prevent sarcopenia and enhance muscle mass, which in turn promotes improved appetite and nutrient metabolism, geriatric care teams can also implement physical activity interventions, such as resistance training and balance exercises. When dysphagia is present, swallowing therapists (speech-language pathologists) may also be involved, providing exercises and compensatory techniques that maintain safe and efficient oral intake.

Finally, professional communication must be organized. Nutrition, oral rehabilitation, and medical management are all in line with the objectives and abilities of the patient thanks to interdisciplinary case evaluations and shared care plans. In long-term care institutions, where malnutrition and poor oral health are common yet can go undiagnosed, this is particularly crucial.

4. Special Considerations for Medically Compromised

Patients who are completely edentulous and have systemic medical conditions—like diabetes mellitus, chronic kidney disease, cardiovascular disease, or xerostomia caused by medication—encounter increased nutritional risks because of compromised oral function. The loss of teeth significantly diminishes masticatory efficiency, leading to the avoidance of fibrous, nutrient-rich foods and resulting in insufficient intake of protein, dietary fiber, vitamins (A, C, B6, folate), calcium, magnesium, and iron.

In people with weakened immune systems, edentulism dramatically raises the risk of malnutrition. Seniors who are institutionalized and have both systemic frailty and poor dentition had lower serum albumin levels and BMIs than those who have superior oral function. On the other hand, edentulous people who live alone might eat softer processed foods that are higher in energy but low in nutrients, which could result in overweight or obesity or micronutrient deficiencies.

Nutritional status can be improved with implant-supported therapies. Medically compromised elderly people wearing traditional complete dentures and those receiving implant-supported mandibular overdentures were compared in one study conducted at the University of São Paulo: Significant differences in chewing ability were found to correlate with nutritional risk, with 76.5% of the implant group being classified as well-nourished compared to 43.5% in the conventional group.[14]

Texture modification and dietary counselling are essential particularly for people with medical conditions whose nutrient requirements may be higher. In order to achieve micronutrient and protein requirements despite impaired chewing function, patients can benefit from counseling and education to adopt softer, nutrient-dense alternatives, such as smoothies, pureed vegetables, minced moist proteins, fortified dairy, and oral nutrition supplements.[15]

Hydration needs to be closely monitored in edentulous patients with medical conditions. Dehydration can affect oral mucosal integrity, denture tolerance, and total nutritional intake, and it can be exacerbated by xerostomia and drugs.

Many patients still have nutritional deficiencies even after receiving prosthetic rehabilitation. Even when chewing skills improved, 25–50% of patients had insufficient intakes of vitamins A, D, E, B6, or magnesium, and over 40% of patients had inadequate intakes of dietary fiber or calcium over the three years after delivery of conventional vs. implant-supported mandibular dentures.

Some Important keypoints for controlling nutrition in patients who are medically challenged and fully edentulous include:

1. Rehabilitation of prosthetics, ideally overdentures supported by implants, to improve mastication and encourage a wider variety of food consumption.
2. Customized nutritional advice, in conjunction with a dietician, for ailments like diabetes or chronic renal disease.
3. Nutrient-dense, texture-modified meal planning that uses rich, soft food substitutes and supplements to guarantee enough protein, vitamins, minerals, and fiber.
4. Tracking biochemical and anthropometric indicators (such as albumin and BMI) over time to identify malnutrition risk and modify treatment as necessary.

Clinicians can help reduce the compounded nutritional vulnerabilities of medically compromised edentulous patients by combining prosthetic care with individualized dietary plans and medical supervision. This will improve quality of life, prevent illness progression, and improve systemic health outcomes.

5. Conclusion

Edentulous older adults frequently gravitate toward softer, higher-calorie foods that are deficient in vital nutrients like calcium, fibre, protein, and vitamins A, C, and B-complex when their masticatory function declines. These dietary modifications lead to a series of adverse health consequences, such as immunological dysfunction, sarcopenia, frailty, and anaemia, all of which exacerbate aging and raise the chance of hospitalization, and institutionalization and even death. Masticatory efficiency and self-confidence are enhanced by prosthetic rehabilitation with full dentures or implant-supported over dentures; nevertheless, studies indicate that these measures by themselves do not consistently result in improved nutrition. Several clinical trials have shown that, in contrast to traditional dentures, implant-supported dentures do not significantly enhance meal intake or biochemical nutritional markers unless accompanied by nutrition counseling, despite the fact that they may offer higher comfort and retention.

Multidisciplinary approaches that include customized dietary interventions with Prosthodontic care have been shown to be effective in edentulous elderly adults. It has been demonstrated that nutritional counseling helps edentulous patients achieve minor improvements in their BMI and MNA scores, increase their consumption of fruits and vegetables, and improve the quality of their protein. Dieticians can assist in creating nutrient-dense, texture-modified diets that are suited to medical problems, cultural preferences, and chewing difficulties when paired with nutritional screening instruments such as the MNA. To coordinate care, primary care physicians, dieticians, dentists, and other specialists must contact on a regular basis. Working together professionally is crucial for success. Clinical decisions can be guided by the useful standards for protein and calorie intake provided by guidelines. Treatment planning also needs to take financial barriers, swallowing difficulties, and xerostomia into consideration.

In case of medically compromised individuals eventhough prosthetic rehabilitation helps function, continued dietary counseling and hydration monitoring are essential to ensuring proper nutrient intake and general health for edentulous individuals with systemic disorders.

Prosthetic treatment alone is unable to address the dietary issues that older edentulous patients experience. Only when oral rehabilitation is combined with interdisciplinary care, long-term follow-up, and thorough nutritional recommendations can the best results be obtained. Future studies should concentrate on the long-term results of these integrated models in order to confirm their efficacy and encourage modifications to geriatric care policies.

5. Source of Funding

None.

6. Conflict of Interest

None.

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