Nutritional Assessment in Completely Edentulous Geriatric Patients

Krishna Prasad D[1], Farah Demeri[2], Chethan Hegde[3], Anupama Prasad D[4]

ABSTRACT

Aims and objectives: The relationship between nutrition and oral health in geriatric patients is controversial and complex. It has been suggested that poor oral health leads to a decreased ability to chew having profound influence on diet, food selection, and therefore affect the nutritional status of an individual. This study aimed to evaluate the effect of edentulousness on the nutritional health of geriatric patients.

Materials and methods: A total of 200 completely edentulous geriatric patients were selected for the study. The nutritional status was assessed using the mini-nutritional assessment (MNA) form before the complete denture treatment. The individual scores obtained for each question based on which the total score was determined. Correct responses of each question were calculated in percentage.

Results: The results showed statistically insignificant differences in the total MNA scores between males and females in the study. The edentulous patients without complete dentures had significantly lower MNA scores and 88.5% of the study group were at risk of malnourishment.

Conclusion: Prosthetic rehabilitation of the edentulous subjects, along with the dietary counseling can improve the nutritional status of geriatric complete denture patients as it will enhance the chewing ability and function.

Clinical significance: Early assessment of nutritional status in completely edentulous patients can permit an early nutritional intervention when necessary so as to prevent malnutrition.

Keywords: Counseling, Edentulous, Geriatrics, Mini-nutritional assessment, Nutrition.

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INTRODUCTION

Diet is a necessary element to lead a healthy life, since it plays a role in the etiology and aids in the management and prevention of chronic conditions that include obesity, cardiovascular disease, diabetes, and cancer.[1,2] The oral cavity which primarily aids in mastication is an entryway for nutrient consumption.[3] Tooth loss decreases chewing ability and masticatory function, thus limiting food choices and variety in the person's diet.[4,5]

Elderly patients suffer from various diseases that tend to impair their nutritional status.[6] In addition to chronic diseases, they also suffer from loss of teeth. Russia and Mexico have edentulous population of about 16.3–21.7%, Ghana, South Africa and, China is about 3.0–9.0%, whereas, in India, it is 11.7%. Successful prosthodontic treatment in the geriatric edentulous population is necessary for the general health of oral hard and soft tissues.[7]

The elderly population suffers from malnutrition, and it is a health problem having multifactorial parameters. These include social, economic, and physiological parameters. These parameters are referred to as the 9 d's, namely dysgeusia, diarrhea, poor dentition, disease, dysphagia, depression, dysfunction, drugs, and dementia.[8] Early diagnosis and treatment of malnutrition is the key to stop this vicious cycle.[9]

In order to recognize malnutrition at an early stage, various nutritional screening tools have been proposed. These screening tools are based mainly on clinical, nutritional, and biochemical indexes. The mini-nutritional assessment (MNA) form is based on anthropometric, general, dietary, and self-assessment by the patients.[10]

The aims of the present survey were to assess the nutritional status in geriatric patients who are completely edentulous and to evaluate their risk of malnutrition. This will enable us in the early nutritional intervention when needed using the MNA.

[1–4]Department of Prosthodontics and Crown and Bridge, AB Shetty Memorial Institute of Dental Sciences, NITTE (Deemed to be University), Mangaluru, Karnataka, India

Corresponding Author: Anupama Prasad D, Department of Prosthodontics and Crown and Bridge, AB Shetty Memorial Institute of Dental Sciences, NITTE (Deemed to be University), Mangaluru, Karnataka, India, Phone: +91 9448504764, e-mail: dranupamaprasad@nitte.edu.in

MATERIALS AND METHODS

Two hundred completely edentulous subjects visiting the outpatient department of our institute were selected for this survey. The patients gave a written consent prior to the study. The MNA questionnaire was filled out by the examiner for each patient. The assessment included anthropometric, general, dietary, and self-assessment. The patients were asked questions in their native language for ease of understanding. Only completely edentulous subjects were considered in the survey. The minimum period of edentulousness for each subject included was >1 year. Patients less than the age of 65 years were not considered in the study. The study excluded patients who wore complete dentures for more than a year. The results of the study were compiled and statistical analysis was conducted. The individual responses were subjected to percentage statistics, and student *t*-test was applied.

RESULTS

The total score was calculated for each question in the questionnaire. Eleven percent patients showed a body mass index (BMI) below 19, which is considered to be underweight. 34.5% had a BMI of 19–21, and 53% had a BMI of 21–23, which is considered to be in the normal range. 1.5% of patients were considered obese (Table 1). Table 2 measures the mid-arm circumference, of which 48% of patients showed a mid-arm circumference of 21–22 cm, 40.5% more than 22 cm, and 11.5% less than 21 cm. Measured calf circumference of more than 31 cm was seen in 62.5% patients and less than 31 cm in 37.5% patients (Table 3). Table 4 shows the total assessment after the final calculation of points by the examiner. In our study, the well-nourished population constituted of only 1% sample. 88.5% of the study population were at increased risk of malnutrition, and 10.5% were malnourished. Ninety-six males and 104 females were a part of the study. The mean malnutrition score for males and females was 19.573 and 19.567, respectively, indicating that both groups were at risk of malnutrition (Table 5). However, these results were statistically not significant, with a p value of 0.98. Table 6 shows 1% of males and females were malnourished. 90.6% of males and 86.5% of females are at risk of malnutrition, whereas 8.3% of males and 12.5% of females are malnourished. These results are statistically not significant, with a p value of 0.63.

DISCUSSION

The validation and development of the MNA was a joint research program between the Department of Internal Medicine and Clinical

Table 1: Measurement of body mass index

	Frequency	Percent
<19	22	11.0
19–21	69	34.5
21–23	106	53.0
≥23	3	1.5
Total	200	100.0

Table 2: Measurement of mid-arm circumference in centimeter

	Frequency	Percent
<21 cm	23	11.5
21–22 cm	96	48.0
>22 cm	81	40.5
Total	200	100.0

Table 3: Measurement of calf circumference in centimeter

	Frequency	Percent
<31 cm	75	37.5
≥31 cm	125	62.5
Total	200	100.0

Table 4: Total malnutrition assessment

	Frequency	Percent
Well nourished	2	1.0
At risk of malnutrition	177	88.5
Malnourished	21	10.5
Total	200	100.0

Gerontology, Toulouse University Hospital, France, the Clinical Nutrition Program, University of New Mexico, USA, and the Nestlé Research Center, Lausanne, Switzerland.[11] This test contains a series of questions and measurements that consist of measurements of weight, weight loss, and height (anthropometric measurements), six questions on global assessment which include mobility, medication and lifestyle, subjective perception of health and nutrition, and eight questions related to the diet of the patient.[9] Many studies have identified MNA as a tool for early identification of malnutrition, and thereby helping us in the early intervention of the disease process.[12]

Nutritional status of a patient can be designated as good when the MNA score is ≥24. Information should be provided to these patients about how to remain healthy and maintain nourishment. If the patients experience weight loss they should reported it to their concerned physician. Geriatric patients should have a flexible diet and not restrict food consumptions to a cholesterol-restricted diet. A MNA score of 17 or below is indicative of protein–calorie deficit.[2–4] These individuals experience weight loss and present with decreased serum albumin. For these patients, a thorough nutritional assessment is indicated. This measurement helps us to identify and study the disease cause and start treatment to increase overall health and nourishment.[13] Mini-nutritional assessment scores between 17 and 23.5 are defined as the people who are at risk of malnutrition. Serum albumin levels may be normal in these individuals and they may not experience weight loss. However, these patients show a reduction in caloric intake. This calorie deficit can be corrected by an adequate nutrition.[2–4]

Poor oral status, especially edentulism, affects the nutritional status and overall health. Difficulty in chewing impairs the functional capacity and thereby overall health. With an increase in age, people tend to increase the number of chewing strokes to form a bolus for swallowing. Age is not the only determinant of masticatory ability. The extent to which a patient loses his/her teeth can affect the chewing performance and the selection of food.[14]

Prosthetic rehabilitation plays a key role in affecting nutritional status of edentulous individuals. Edentulousness causes a decline in masticatory ability, which is compensated by many patients by choosing cooked foods or processed foods rather than fresh

Table 5: Group statistics

	Gender	N	Mean	Std. deviation	t
Total	Male	96	19.573	1.906	0.021
	Female	104	19.567	1.799	p = 0.983 ns

p = 0.983 (not significant)

Table 6: Total assessment and gender

		Gender		
		Male[a]	Female	Total
Well nourished	Count	1	1	2
	%	1.0	1.0	1.0
At risk of malnutrition	Count	87	90	177
	%	90.6	86.5	88.5
Malnourished	Count	8	13	21
	%	8.3	12.5	10.5
Total	Count	96	104	200
	%	100.0	100.0	100.0

[a]X^2 = 0.923, p = 0.63 ns

foods. These individuals have a diet that is low in non-starch polysaccharides and also has difficulty in eating some forms of bread, vegetables, and fruits. Due to an imbalance in food intake and/or reduced nutrient bioavailability, gastrointestinal disturbance can be the end result.

Studies have shown that prosthodontically if we rehabilitate these edentulous patients with a complete denture prosthesis, it can improve the diet quality and food choices in these geriatric patients. However, few studies point out to the fact that some rehabilitation does not necessarily change the diet pattern of geriatric individuals.[5,15,16]

Our study pointed out that majority of the patients were at risk of malnutrition (88.5%), 10.5% were found to be malnourished, and 1% were well-nourished. Thus, oral health status and nutrition are said to be related. Before treatment with complete dentures, edentulous patients show lower MNA scores when compared to those who have been rehabilitated. Studies indicate that rehabilitation with complete denture counteracts the effect of missing teeth. Individuals who have a higher MNA score have increased eating pleasure and reduced eating difficulties.[17]

Nutritional deficiency has a multifactorial etiology. Mental physical and general health, psychological habits, and socioeconomic status are the factors affecting the diet habits of an individual. The fourth factor associated with diet selection is oral health status, which is usually affected in geriatric individuals.[17,18] By including these factors, this study was carried out by utilizing the MNA.

Conclusion

Within the limitations of this study, it can be concluded that:

- Poor oral health status affects the ability in eating food and also decreases eating pleasure.
- There is a higher risk of undernutrition associated with edentulism.
- Dietary counseling and rehabilitation of completely edentulous patients can be performed in order to improve their nutritional intake and function.

Clinical Significance

Early assessment of nutritional status in completely edentulous patients can permit an early nutritional intervention when necessary so as to prevent malnutrition.

Acknowledgment

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