

A Clinical Survey on the Assessment of the Nutritional Status of Completely Edentulous Elderly Adults

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Abstract: **Background:** The percentage of completely edentulous elderly adults is growing very fast and malnutrition is not uncommon in the elderly. **Objectives:** The present study was carried out to assess the nutritional status of the completely edentulous elderly adults using the Mini Nutritional Assessment (MNA) tool. **Materials and Methodology:** A total 40 completely edentulous elderly individuals above 65 years of age meeting the inclusion criteria were randomly selected for the study. The primary tool in this study was a predesigned Mini Nutritional Assessment form developed by Nestle. Score was as follows: Score <17: Malnourished; Score 17-23.5: At risk of malnutrition and Score >23.5: Well-nourished. Anthropometric measurements were done for height, weight, mid-upper arm circumference and calf circumference. **Results:** The results showed 57.5% of patients were at risk of malnutrition, 30% were well nourished and 12.5% were malnourished. **Conclusion & Clinical Relevance:** Dietary guidance based on nutritional assessment in the initial phases of examination and diagnosis should be considered while formulating a comprehensive prosthodontic treatment plan for completely edentulous patients.

Keywords: Complete denture, Elderly adults, Nutrition

1. Introduction

There is a global rise in the aging population. The number of people in the world aged 60 and older is expected to grow past 2 billion by the year 2050. In a report by United Nations Population Fund, the population of elderly people in India will triple by 2050.^[1] Geriatric health of this increased population of elderly adults is a global burden and we also need to introspect honestly, whether the increased life expectancy means better life or just more number of years of poor health!! Edentulism has significant impact on oral and general health of the patients including quality of life, nutrition and enjoyment of food.^[2] Everyone has a part to play for the well being of the elderly, including the government, civil society, communities and families. Prosthodontics, which is a major branch of dentistry that deals with elderly population mainly for the fabrication of complete or removable partial denture can play an important role for the well being of elderly and reduce the global burden of geriatric health. Health of geriatric population depends on number of factors out of which nutrition play an important role.^[3] Proper nutrition leads to healthy oral tissues and healthy oral tissues are necessary for successful complete denture treatment.^[4,5]

The nutrition and health of the elderly is often neglected.^[6] Most nutritional intervention programs are directed toward infants, children, young adolescent, pregnant and lactating mother. However, nutritional interventions could play a part in the prevention of degenerative conditions of the elderly and an improvement of their quality of life. A timely intervention can stop weight loss in those at risk of malnutrition.^[7,8]

Unfortunately, not much importance and explanation has been given for the precise estimate of under-nutrition in this age group during complete denture treatment. An evaluation of nutritional status is important to formulate comprehensive treatment plan for successful complete denture prosthodontic treatment and overall well being of patient. Along with this, it is also important to evaluate nutritional status of elderly adults for creation of a database to assist with the initiation of important programs and formulation of policies. The Mini nutritional assessment (MNA) tool is a well validated tool for assessing malnutrition in the elderly.^[9] The tool was shown to have an accuracy of 92% when it was compared with a clinical evaluation by two physicians specialists in nutrition, and 98% when it was compared with a comprehensive nutritional assessment, including biochemical tests, anthropometric measurements and dietary

assessment.^[10] The present study was carried out to assess the nutritional status of the elderly using the MNA tool.

2. Materials & Methodology

The study was carried out at College of Dental Sciences & Research Centre, Ahmedabad. 40 Completely edentulous elderly adults above 65 years of age, with or without dentures are included in the study. Those who were seriously ill, fed by tube and with known neuropsychiatric illness, were excluded from the study. Patients with known history of nutritional, systemic, or metabolic diseases are excluded in this study. Patients with addictions such as smoking, chewing tobacco, alcohol consumption were excluded. The primary tool in this study was a predesigned Mini Nutrition Assessment form developed by Nestle and is considered as a valid tool for the assessment of nutritional status. Score was done as follows: Score <17: Malnourished, Score 17-23.5: At risk of malnutrition and Score >23.5: Well nourished.^[11] Ethical clearance was taken from the institutional ethics committee. Informed consent was taken from the participants before commencing the study.

All of the elderly in the present study went through the complete MNA irrespective of the MNA screening score. Anthropometric examination was done for height, weight, mid upper arm circumference and calf circumference. Weight and height were measured by using standardized weighing machine and stadiometer respectively. Weight was measured to the nearest 0.1 kg and height to the nearest 0.1 cm. For the elderly with spinal curvatures, arm length was used to estimate height.

3. Results

Data were collected from 40 subjects and tabulated using Microsoft Excel 2010. Statistical analysis was performed using SPSS (SPSS Statistics software v20; IBM Corp). Level of significance was set at $\alpha = 0.05$. Appropriate statistical analysis – {Mean, Standard deviation, Analysis of Variance (ANOVA) with post-hoc tests were carried out to derive conclusions.

Table 1: Distribution of subjects as per MNA score and its association with anthropometric measurements

MNA Score	Nutritional status	N	BMI			CC			MAC		
			Mean	SD	P-Value	Mean	SD	P-Value	Mean	SD	P-Value
>23.5	Normal	12	28.94	5.76	<0.001	37.13	4.27	<0.001	27.42	5.61	0.021
17-23.5	At risk of malnutrition	23	23.61	3.46		31.76	5.28		24.22	3.94	
<17	Malnourished	5	18.57	1.31		28.00	2.12		20.9	2.46	

Body Mass Index (BMI), Calf circumference(CC) and Mid upper arm circumference(MAC) were found to be most low

in malnourished patients. These results were found to be statistically significant ($P < 0.05$)

Table 2: Tukey's Post-hoc test for Intergroup comparison

Nutritional status Comparisons	Tukey HSD for BMI		Tukey HSD for CC		Tukey HSD for MAC	
	P-value	Inference	P-value	Inference	P-value	Inference
Normal v/s at risk of malnutrition	0.002	Significant Difference	0.008	Significant Difference	0.115	No Significant Difference
Normal v/s malnourished	0.001	Significant Difference	0.002	Significant Difference	0.022	Significant Difference
At risk of malnutrition v/s malnourished	0.047	Significant Difference	0.255	No Significant Difference	0.288	No Significant Difference

Statistically significant difference is present for Body Mass Index (BMI) between all 3 groups. Statistically significant difference was found for Calf circumference (CC), when comparing normal group of patients with malnourished and at the risk of malnutrition but no significant difference was found when comparing malnourished patients with at the risk of malnutrition. For Mid upper Arm Circumference (MAC), no significant difference was found while comparing at the risk of malnutrition group with normal and malnourished group but significant difference was observed while comparing normal patients with malnourished group of patients.

4. Discussion

Older people are vulnerable to malnutrition for many reasons including physiological and functional changes that occur with age, lack of financial support and inadequate access to food. The functional status of the elderly is their ability to carry out their day to day activities including preparation of food and intake, thereby affecting nutritional status. In India, the problem of the health of the elderly is

compounded by poor nutrition together with medical issues, including both communicable and non communicable diseases. Malnutrition and morbidity create a vicious cycle.

The overall prevalence of malnutrition was found to be 12.5%, but the alarming fact is that the proportion of elderly at risk of malnutrition was relatively very high 57.5%. The findings of this study are similar to those of Rashmi Agarwalla et al.^[12] In their study done in rural TamilNadu, Vedantam et al.^[13] found that 14% of the elderly were malnourished. Ferdouset al.,^[14] Baweja et al.^[15] and Sakaetal.^[16] also had similar results in their studies. However, the study conducted by Saeidlou et al. in a nursing home in Iran (2008)^[17] observed that a considerably higher percentage (49.6%) of the elderly were malnourished. This could be due to the difference in profiling and characteristics of the study population.

Ettinger and Beck in 1984 had classified elderly group of patients into three categories according their functionality, functionally independent elderly, frail elderly and functionally dependent elderly.^[18] The present study was

carried out in sample of only 40 completely edentulous individuals in our institutional OPD only so other clusters should be included in this study. Further study needs to be carried out to identify other factors of nutritional risk in completely edentulous elderly adults.

5. Conclusion

To keep pace with recent findings, this study helps in diagnosis of complete denture patients who are at risk of malnutrition by using Mini Nutritional Assessment form. Thus, Dietary guidance based on nutritional assessment in the initial phases of examination and diagnosis should be considered while formulating a comprehensive prosthodontic treatment plan for complete denture patients.

References

- [1] Kinsella KG, Phillips DR. Global aging: The challenge of success. Washington, DC: Population Reference Bureau; 2005 Mar 1.
- [2] Lee JS, Weyant RJ, Corby P, Kritchevsky SB, Harris TB, Rooks R, Rubin SM, Newman AB. Edentulism and nutritional status in a biracial sample of well-functioning, community-dwelling elderly: the health, aging, and body composition study. *The American journal of clinical nutrition*. 2004 Feb 1;79(2):295-302.
- [3] Hickey JC, Zarb GA, Bolender CL. Prosthodontic treatment for edentulous patients. St. Louis: CV Mosby Company; 1975.
- [4] Heartwell CM, Rahn AO. Syllabus of complete dentures. Lea &Febiger; 1986.
- [5] Winkler S, editor. Essentials of complete denture prosthodontics. Year Book Medical Pub; 1988.
- [6] Nizel AE, Papas AS. Nutrition in clinical dentistry. 1989.
- [7] Holm-Pedersen P, Walls AW, Ship JA, editors. Textbook of geriatric dentistry. John Wiley & Sons; 2015 Jun 19.
- [8] Pollack RL, Kravitz E. Nutrition in oral health and disease. Lea and Febiger; 1985.
- [9] Guigoz Y. The Mini Nutritional Assessment (MNA®) Review of the literature-What does it tell us?. *Journal of Nutrition Health and Aging*. 2006 Nov 1;10(6):466.
- [10] Vellas B, Villars H, Abellan G, Soto ME, Rolland Y, Guigoz Y, Morley JE, Chumlea W, Salva A, Rubenstein LZ, Garry P. Overview of the MNA®-Its history and challenges. *Journal of Nutrition Health and Aging*. 2006 Nov 1;10(6):456.
- [11] Mini Nutritional Assessment. Nestle Nutrition Institute. Available from: <http://www.mna-elderly.com/>. [Last accessed on 2012 Jun 22].
- [12] Rashmi A et al. Assessment of the nutritional status of elderly and its correlates. *J Family Community Med* 2015 ; 22:39-43
- [13] Vedantam A, Subramanian V, Rao NV, John KR. Malnutrition in free-living elderly in rural south India: prevalence and risk factors. *Public health nutrition*. 2010 Sep;13(9):1328-32.
- [14] Ferdous T, Kabir ZN, Wahlin Å, Streatfield K, Cederholm T. The multidimensional background of malnutrition among rural older individuals in Bangladesh—a challenge for the Millennium Development Goal. *Public health nutrition*. 2009 Dec;12(12):2270-8.
- [15] Baweja S, Agarwal H, Mathur A, Haladiya KR, Mathur A. Assessment of nutritional status and related risk factors in community dwelling elderly in western Rajasthan. *J Indian Acad Geriatr* 2008;1:5-13.
- [16] Saka B, Kaya O, Ozturk GB, Erten N, Karan MA. Malnutrition in the elderly and its relationship with other geriatric syndromes. *Clinical nutrition*. 2010 Dec 1;29(6):745-8.
- [17] Saeidlou SN, Merdol TK, Mikaili P, Bektaş Y. ASSESSMENT OF THE NUTRITIONAL STATUS AND AFFECTING FACTORS OF ELDERLY PEOPLE LIVING AT SIX NURSING HOME IN URMIA, IRAN. *International Journal of Academic Research*. 2011 Jan 1;3(1).
- [18] Ettinger RL, Beck JD. Geriatric dentistry: is there such a discipline?. *Australian dental journal*. 1984 Dec;29(6):355-61.