

Effect of Complete Denture Prosthesis on Qualitative and Quantitative Diet of Completely Edentulous Patients Prior to and after the Insertion

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ABSTRACT

Background: The relationship between functional and oral health of the edentulous patients is virtually unknown. It appears that the masticatory efficiency results in a comparatively good diet; however, the society today is geared towards a diet of highly refined foods, many of which are soft and can be easily masticated.

Aim & Objective: The objective of this study was to assess the quality of nutrition prior to and after the insertion of the complete denture prosthesis and to study the influence of complete denture prosthesis on the nutritional intake of the geriatric adults.

Materials and Method: The study was conducted on a selected group of 20 edentulous patients between the age group 60-90 years. The case history Performa was used to obtain the complete medical, dental and socio-economic status. Dietary questionnaires were used to check the daily intake of the patients before and after the insertion of the complete denture prosthesis. The dietary reports were analysed and the nutritional status of the patients was determined. The dietary reports of the patients before and after the insertion of the complete denture prosthesis.

Results: There was significant difference in the nutritional intake of the patients after the insertion of the complete denture prosthesis.

Conclusion: From the results of this study, it was concluded that impaired masticatory function because of the edentulism may restrict the dietary selection and the nutrient intake. The presence of complete denture prosthesis, food communication capacity, and perceived chewing ability in completely edentulous patients helps to improve the overall diet quality or quantity. Other factors, such as physiologic, social, economic, and psychological factors, are also very significant in the choice of food.

Keywords: Edentulous, complete denture prosthesis, geriatric.

INTRODUCTION

The widespread prevalence of tooth loss seen in the elderly and the impact of impaired masticatory ability on food selection patterns is often overlooked. Available information suggests that declining masticatory function is, in a large part, responsible for the elderly subjects consuming

predominantly soft, easy to chew foods, which in turn, can induce poor dietary practices and marginal nutritional intakes¹. It appears that with appreciable tooth loss there is a appreciable is a related decline in masticatory function: significant alterations also take place in certain perceptual and sensory measures.

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Several surveys and studies on the dietary intake in older individuals have reported caloric intakes below the optimal requirements^{2,3,4,5}. In a number of studies calcium, iron and thiamine intake were found to be deficient. Aging is often associated with dysregulation of immune response even among healthy individuals: some of these changes may be secondary to deficiencies of macronutrients and micronutrients (B6, B12, and folic acid as well as iron and zinc). Aging is also associated with increase in chronic disease as well as infections and associated morbidity. This decline in immune function with aging may be due to the aging process per se or is secondary to poor health, inflammation, and other life style factors particularly suboptimal nutritional status.

The relationship between functional oral health and the nutrition of the edentulous patients is virtually unknown. It appears to be a commonly held belief that the masticatory efficiency results in a comparatively good diet; however the society today is geared towards a diet of highly refined foods. Socioeconomic factors and monetary considerations are also strong factors in choice of food and geriatric patients⁶.

Research that can provide more answers to health care problems in this growing group, educating professionals with respect to the relationships between oral health and nutrition, and public policy changes with regard to provision and funding of nutrition services, especially when provided by registered and /or licensed nutrition professionals, evaluating and understanding the nutritional status of the elderly subjects and the fabrication of a biologically acceptable prosthesis, to increase the efficiency of the masticatory system, by the prosthodontist, also contribute to improving the health and quality of life for elders. Dental literature that is directly related to the nutrition of the elderly has not been abundant. Hence, this study is undertaken to compare and assess the quality and quantity of nutritional intake on completely edentulous geriatric patients in north Bihar adjoining Nepal border, before and after the insertion of the complete denture prosthesis.

MATERIALS AND METHODS

The methodology can be described under the following headings:

1. Selection of subject.
2. Analysis of the oral and general health, socioeconomic status.
3. Analysis of the diet prior to the insertion of the complete denture prosthesis
4. Analysis of the diet after the insertion of the complete denture prosthesis
5. Evaluation and comparison of the nutritional intake.

Selection of subjects: The individuals for the study were selected from the patients seeking dental treatments at north Bihar region adjoining Nepal border. The study group consisted of 20 completely edentulous patients sixty years and above. One month after the insertion of the complete denture prosthesis, the patients were evaluated as it was considered that the complete denture prosthesis would be well adapted to the supporting tissues as well as being integrated into the stomatognathic system.

Analysis of the oral and general health, socioeconomic status: A complete medical, dental and socioeconomic history was obtained from each participant and recorded with the help of standardized Case History Form.

Analysis of the diet prior to the insertion of the complete denture prosthesis: The diets of the patients were evaluated prior to and after the insertion of complete denture prosthesis. Evaluation was done with the help of the dietary questionnaire.

Evaluation and comparison of the nutritional intake: The diet evaluation results prior to and after the insertion of the complete denture prosthesis were compared by means of student's t-test for paired comparisons. The dietary intakes of the subjects prior to and after the insertion of the complete denture prosthesis were analysed by a multi-variate t test for differences from the 100% Recommended Dietary Allowance.

RESULTS

The results of the study conducted showed that the nutritional intake of geriatric patients varied significantly after the insertion of the complete denture prosthesis. The results thus showed that compromised dental function results in the

swallowing of poorly chewed food, dietary inadequacies, and systemic changes favouring

illness, reduced vigour, debilitation and shortened life expectancy.

Table 1: comparison of the quality of the food intake and the nutrient content prior to and after the insertion of the complete denture prosthesis.

Nutrients	Ideal requirements	Normal intake in these rural areas	Diet quantity range and its nutrient content before the insertion of complete denture prosthesis.	Diet quantity range and its nutrient content after the insertion of complete denture prosthesis.
Carbohydrate	850 mg	700-900 mg	600-650 mg	700-750 mg
Fats	28 mg	25-30 mg	20-25 mg	25-30 mg
Proteins	55 mg	50-60 mg	40-45 mg	50-55 mg
Minerals (calcium)	450-500 mg	350-450 mg	270-310 mg	350-400 mg
Water	7-10 glasses	7-10 glasses	7-8 glasses	8-10 glasses
Vitamins	65 mg	55-60 mg	40-45 mg	55-65 mg

Table 2: Prior to and after the insertion of the complete denture prosthesis (probability of deviation from 100% RDA).

NUTRIENT	Before insertion <i>p</i>	After insertion <i>p</i>
Significantly lower than 100%RDA		
Magnesium	.00005	.00005
Zinc	.00005	.0001
Calcium	.0001	.0001
Significantly higher than 100%RDA		
Protein	.00045	.0004
Vitamin E	.0004	.00045

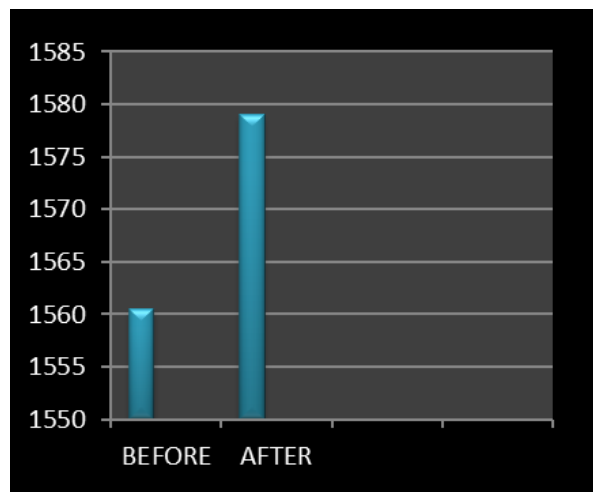
Table 3: Paired sample statistics : average of each of the two values.

Period	mean	N	Std.Deviation	Std .Error Mean
Before	1560.560	20	284.3008	63.5725
After	1579.026	20	309.3965	69.1839

Table 4: paired sample test comparison of the values

Paired differences		t-value	p-value
mean	SD		
18.4760	114.16428	1.302	.0194

Graph 1: Comparison of mean nutritional intake prior to and after insertion of denture.



CONCLUSION

From the results of the study the following conclusions were drawn:

1. There was significant increase in the quality and quantity of the nutritional intake of the edentulous geriatric patients after the insertion of the complete denture prosthesis.
2. Other factors like economical, social, psychological may also be very important

DISCUSSION

The dietary intake of a geriatric patients is a very complex issue. The dietary intake affects all the factors that lead to the choice and intake of food, including personal preference and resource availability. The mastication of the food depends upon several anatomical structures of the stomatognathic system, sensorimotor control, perception, and food characteristics⁷. It has been suggested that impaired chewing because of edentulism may restrict the dietary selection and the nutrient intake. A logical extension of this idea would be that the presence of good quality complete denture prosthesis would be less restricting than edentulism. The results of this present study supports this assumption. The presence of the complete denture prosthesis, food consumption capacity, and perceived chewing ability in completely edentulous patients helps to improve the overall diet quality or quantity.

This study showed that certain nutrients were generally deficient in the geriatric patients e.g. magnesium, fluoride, zinc and calcium. In this study RDA was used as the base line. Mild zinc deficiency is suspected among the elderly⁸.

The physical signs of the deficiencies of these nutrients develop after period of inadequate intake during which tissues stores are depleted and metabolism is disturbed. In addition, they are non specific, in fact, some clinical signs of malnutrition are often considered normal in aging process for example, hair loss, skin changes, missing teeth, muscle wasting and mental confusion.

Massler Maury⁹ did a study of geriatric nutrition and the role of fibre in the diet of the elderly. He concluded that a good denture in a moist oral environment is essential to properly masticate the food and the vegetables so important to the health of the elderly.

Moynihan PJ et al¹⁰ conducted a study on the intake of non-starch polysaccharide (dietary fibers) in edentulous and dentate persons. Compromised masticatory efficiency places edentulous persons at risk of consuming a diet low in non starch polysaccharide. Specific advice on food selection is required to ensure the edentulous patients has an adequate intake of NSP.

Alan H Wayler¹¹ conducted a study on the impact of complete denture on the masticatory performance and food choice in the healthy aging men. He concluded that the shift in the food selection patterns results from impairment in the masticatory ability and the preference for softer and easier to chew foods in the edentulous patients. But other factors such as physiological, social, economic, and psychological factors are probably more significant in the choice of food, as can be seen in present study which has been conducted in present study which has been conducted on a selected group of poor economy and rural background.

Providing dietary guidance for the geriatric patients can be a very rewarding aspect of dental practice. The prosthodontist will be increasingly expected to fulfill their responsibility for providing nutritional guidance as a part of oral health care. It is apparent that the management of the geriatric patients must be multidisciplinary in nature. Effective care for the

elderly patients requires knowledge about the disease of aging and impact of the impact of those disease on oral health and nutrition, pharmacology. The attitudes of empathy and understanding, caring, and compassion, respect and a positive attitude towards the older patients and flexibility in treatment planning are also critical elements. Recognising and treating oral health and nutrition problems are important in improving the health and quality of life for the elderly population.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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