(e) ISSN Online: 2321-9599

(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

Comparative Assessment of Nutritional Status of Patients using Conventional Complete Denture and Implant Supported Overdenture

Ranjana Khokhar

PG student, Department of Prosthodontics, Maharaja Ganga Singh Dental College and Research Centre Sri-Ganganagar, Rajasthan, India

ABSTRACT:
Background: The satisfaction rate of completely edentulous patients has been reported to be 70%. The rest 30% patients have complaints with their dentures regarding inadequate stability and retention especially for lower denture, pain and difficulty on chewing food. After implant treatment, patients report high levels of satisfaction regarding various aspects of their denture function and they are more satisfied than patients with similar problems who receive a conventional denture without implant support. **Aim of the study:** To assess the nutritional status of patients using conventional complete dentures and implant supported overdentures. **Materials and methods:** The present study was conducted in the Department of Prosthodontics of the dental institution. For the study, we selected 50 edentulous patients. 25 patients had got implant supported overdenture while 25 had got conventional complete dentures. The age of the patients ranged from 35 to 65 years. For the evaluation of nutritional status of patients, 50 cc of venous blood from antecubital vein was taken from each patient and sent to laboratory for evaluation. **Results: A** total of 50 subjects participated, 25 patients in each group, Group CD and Group IO. The mean age of patients in Group CD was 52.92 years and Group IO was 54.31 years. On comparing the mean of different parameters, non-significant results were obtained. The mean values of majority of the variables fall in the normal values except Cholesterol levels. **Conclusion:** the comparison of nutritional status of patients using conventional complete denture and patients with implant supported overdentures from past 10 years showed non-significant differences. The blood parameters for both the groups were in normal range except for cholesterol levels.
Keywords: Complete denture, Edentulous, Implant, Overdenture.

Corresponding author: Dr. Ranjana Khokhar, PG student, Department of Prosthodontics, Maharaja Ganga Singh Dental College and Research Centre Sri-Ganganagar, Rajasthan, India

This article may be cited as: Khokhar R. Comparative Assessment of Nutritional Status of Patients using Conventional Complete Denture and Implant Supported Overdenture. J Adv Med Dent Scie Res 2017;5(9):1-4.

Access this article online	
Quick Response Code	Website: www.jamdsr.com
	DOI: 10.21276/jamdsr.2017.5.9.01

INTRODUCTION:

The satisfaction rate of completely edentulous patients has been reported to be 70%. The rest 30% patients have complaints with their dentures regarding inadequate stability and retention especially for lower denture, pain and difficulty on chewing food.[1, 2] With time, the resulting pain and difficulty may increase during oral functions to an extent that proper nutritional intake and the patient's ability to communicate with ease and confidence are jeopardized. Psychosocial problems are the result of diminished attractive facial appearance, difficulties with speech and avoidance of social contacts. The mouth is the usual pathway for nourishment. Pain from irritated gingiva or chewing difficulties due to ill-fitting dentures may profoundly influence one's desire and ability to eat properly.[3, 4] It has been suggested that these factors can lead to an unbalanced diet and deficient nutrient intake. However, it has been shown that a good chewing ability is not essential for good nutrition and that improvement in masticatory function does not seem to change dietary intake patterns.[5, 6] After implant treatment, patients report high levels of satisfaction regarding various aspects of their denture function and they are more satisfied than patients with similar problems who receive a conventional denture without implant support.[7] Hence, the present study was planned to assess the nutritional status of patients using complete dentures and implant supported overdentures.

MATERIALS AND METHODS:

The present study was conducted in the Department of Prosthodontics of the dental institution. The ethical clearance for the study protocol was obtained from the ethical committee of the institute. For the study, we selected 50 edentulous patients, 25 patients of which had got implant supported overdenture while 25 had got conventional complete dentures. The age of the patients ranged from 35 to 65 years. The inclusion criteria for the study were that the

patients were edentulous for at least 10 years and must have been using their respective dentures regularly. The patients were placed into respective groups, **Group IO- Patients with implant supported overdenture** and **Group CD– Patients with conventional complete denture**.

For the evaluation of nutritional status of patients, 50 cc of venous blood from antecubital vein was taken from each patient and sent to laboratory for evaluation. The laboratory investigation included complete blood count, haemoglobin levels, RBCs count, WBCs count, serum albumin levels, ferritin and carotene, plasma B_{12} levels and folic acid. For anthropometric measurement, body weight and body height were measured for each subject.. The mean values for each variable were calculated and compared.

The statistical analysis of the data was done using SPSS version 20.0 for windows. Student's t-test and Chi- square test were used to check the significance of the data. The $p \leq 0.05$ was pre determined to be statistically significant.

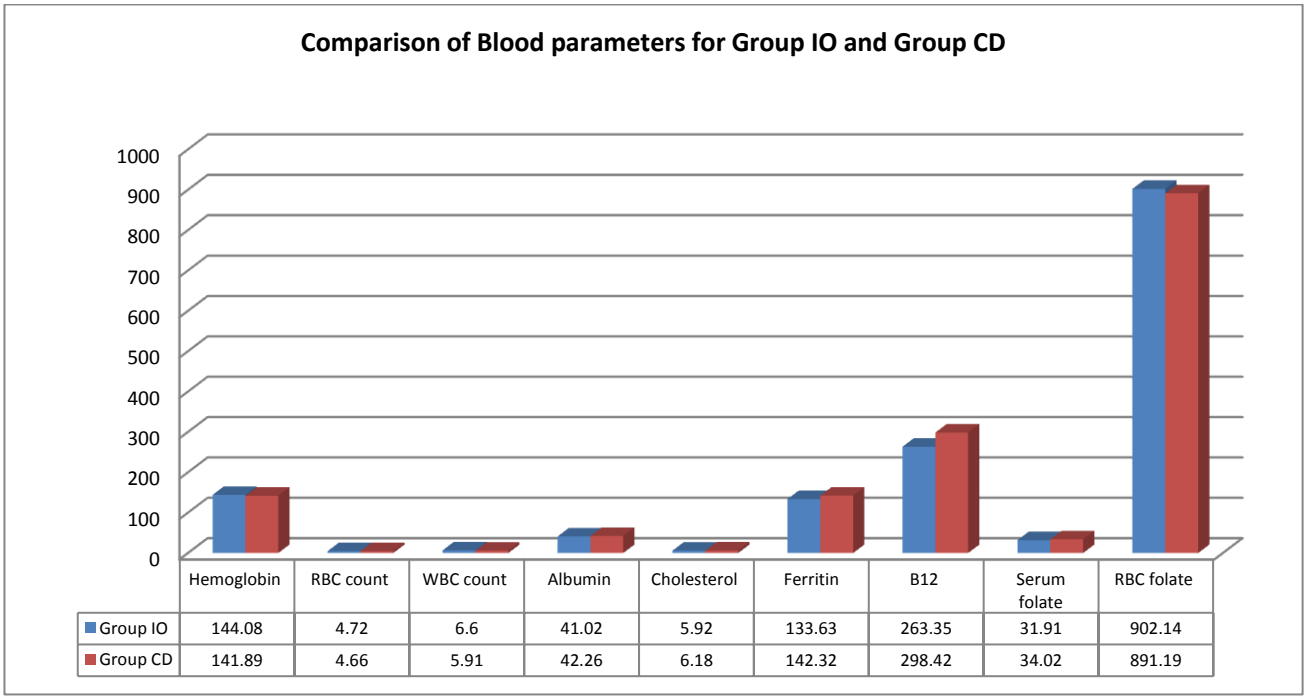
In the present study, a total of 50 subjects participated, 25 patients in each group, Group CD and Group IO. The mean age of patients in Group CD was 52.92 years and Group IO was 54.31 years. The number of male subjects in Group CD and group IO was 14 and 12 respectively. In Group CD, the mean weight of patients was 81$\pm$ 12 kg. In Group IO, the mean weight of patients was 76 $\pm$ 12 kg. The mean height for Group CD and IO was 173$\pm$4 cm and 177$\pm$6 cm respectively. The statistical difference on comparison was found to be insignificant ($p>0.05$). **Table 1** shows the comparison of various blood related parameters for Group IO and Group CD. We observed that on comparing the mean of different parameters, non-significant results were obtained ($p>0.05$ for all parameters). The mean values of majority of the variables fall in the normal values except Cholesterol levels. The mean cholesterol level is found to be increased in both the groups (group CD- 5.92; group IO- 6.18; normal value <5.2 mmol/L) **[Fig 1]**.

RESULTS:

Table 1: Comparison of Blood parameters for Group IO and Group CD

Blood parametrs	Group IO (Mean)	Group CD (Mean)	P-value
Hemoglobin (g/L)	144.08	141.89	0.72
RBC count ($nX10^9$)	4.72	4.66	0.61
WBC count (nX103)	6.6	5.91	0.35
Albumin (g/L)	41.02	42.26	0.88
Cholesterol (mmol/L)	5.92	6.18	0.28
Ferritin (g/L)	133.63	142.32	0.8
B_{12} (pmol/L)	263.35	298.42	0.54
Serum folate(nmol/L)	31.91	34.02	0.19
RBC folate (nmol/L)	902.14	891.19	0.21

Figure 1: Showing comparison of Blood parameters for Group IO and Group CD



DISCUSSION:

The present study was conducted to compare the nutritional status of patients using conventional complete dentures and implant supported overdentures for 10 years. The results showed that the blood parameters for both the groups fall in the normal value range except for cholesterol levels. Also, statistically insignificant comparison was seen for all parameters. So this concludes that there is not significant difference in the nutritional status of both types of patients. Similar studies have been conducted by some other authors. Morais JA et al conducted a randomized clinical trial, and tested for post-treatment differences in nutritional status between patients with mandibular two-implant retained overdentures and those with conventional complete dentures. Edentulous subjects (ages 65-75 yrs) received two-implant mandibular overdentures (IOD, n = 30) or conventional dentures (CD, n = 30). Measures of nutritional state were gathered before and 6 mos after treatment. Significant improvements in anthropometric parameters were detected in the IOD but not in the CD group, for percent body fat and skin-fold thickness at the biceps, subscapularis, and abdomen, with significant decreases in waist circumference and waist-hip ratio. Significant increases were seen in concentrations of serum albumin, hemoglobin, and B_{12}. No significant between-group differences were found. These results suggest that low-cost IOD treatment may improve the nutritional state of edentulous people. Van der Bilt A et al examined the hypothesis that more retention and stability of the overdenture improves the masticatory function. Eighteen patients received two permucosal implants, a new overdenture, and, successively, three different suprastructure modalities: a magnet, a ball, and a bar-clip attachment. They quantified aspects of the oral function by measuring the electromyographic activity of the jaw muscles and the jaw movement during chewing. The muscle activity was significantly lower for the unsupported new mandibular denture compared with values for the supported new denture. No significant differences in muscle activity were observed among the three attachment types. Furthermore, we did not observe significant differences in jaw muscle activity between the old unsupported denture and the new supported denture, despite significant differences in masticatory performance. Measuring muscle activity during chewing will thus not provide adequate information about masticatory function. Thus, subjects chewed more efficiently after implant treatment. No changes in cycle duration or in jaw movement parameters were observed among the various measurement moments.[8, 9] Bakke M et al assessed the outcome of treatment with implant-supported mandibular overdentures in terms of biting and chewing, in entirely satisfied and not fully satisfied patients. Twelve edentulous patients who had worn dentures for at least 5 years participated. They were in good health but had retention problems with their mandibular dentures. First, all patients received new dentures. After 3 months, two Astra Tech implants were placed in the anterior part of the mandible, and 6 months later the abutments were connected. Patient assessment (questionnaire) and functional recordings (chewing ability, bite force, electromyographic activity) were performed with the new dentures, and again 3 months, 1 year, and 5 years after overdenture treatment. After treatment, all patients were able to comminute hard and tough food, the maximum bite force and the chewing activity increased in parallel, and the duration of the chewing cycle was reduced. Every patient felt improved function and reduction of chewing pain. However, the seven patients not fully satisfied with the function of the implant-supported mandibular overdentures were characterized by lower muscle activity, even before implant placement, than the entirely satisfied patients. The authors concluded that implant-supported mandibular overdenture treatment permits better biting and chewing function than conventional complete dentures. Muller K et al evaluated the nutritional status of edentulous patients who randomly received either a mandibular conventional denture (CD) or an implant-supported overdenture (IP) 1 year previously. Weight, height, body composition and handgrip strength measurements were collected for analysis. Blood tests were performed to measure plasma parameters of diet intake. Participants responded to a Food Frequency Questionnaire and a Masticatory Function Questionnaire. Fifty-three people participated. Body composition indicators as well as plasma parameters were generally within normal range, and no statistically significant difference was found between the groups. Patients in the CD group had significantly lower ratings for items regarding difficulty in chewing, but no significant difference was found for dietary intake. Although the CD wearers reported having more difficulty in chewing hard foods, both groups appeared to have a similar nutritional status.[10, 11]

CONCLUSION:

From the results, we conclude that comparison of nutritional status of patients wearing complete denture and patients with implant supported overdentures from past 10 year showed non-significant differences. The blood parameters for both the groups were in normal range except for cholesterol.

REFERENCES:

1. Millar WJ, Locker D. Edentulism and denture use. Health Rep 2005;17:55-58.
2. Horwath CC. Chewing difficulty and dietary intake in the elderly. J Nutr Elder 1989;9:17-24.
3. de Oliveira TR, Frigerio ML. Association between nutrition and the prosthetic condition in edentulous elderly. Gerodontology 2004;21:205-208.
4. Mericske-Stern R, Steinlin Schaffner T, Marti P, Geering AH. Peri-implant mucosal aspects of ITI implants supporting overdentures. A five-year longitudinal study. Clin Oral Implants Res. 1994;5:9–18.

5. Morais JA, Heydecke G, Pawliuk J, Lund JP, Feine JS. The effects of mandibular two-implant overdentures on nutrition in elderly edentulous individuals. J Dent Res. 2003;82:53–58.
6. Budtz-Jørgensen E. Effect of controlled oral hygiene in overdenture wearers: a 3-year study. Int J Prosthodont. 1991;4:226–231.
7. Visser A, Raghoebar GM, Meijer HJ, Batenburg RH, Vissink A. Mandibular overdentures supported by two or four endosseous implants. A 5-year prospective study. Clin Oral Implants Res. 2005;16:19–25.
8. Morais JA, Heydecke G, Pawliuk J, Lund JP, Feine JS. The effects of mandibular two-implant overdentures on nutrition in elderly edentulous individuals. J Dent Res. 2003 Jan;82(1):53-8.
9. van der Bilt A, van Kampen FM, Cune MS. Masticatory function with mandibular implant-supported overdentures fitted with different attachment types. Eur J Oral Sci. 2006 Jun;114(3):191-6.
10. Bakke M, Holm B, Gotfredsen K. Masticatory function and patient satisfaction with implant-supported mandibular overdentures: a prospective 5-year study. Int J Prosthodont. 2002 Nov-Dec;15(6):575-81.
11. Muller K, Morais J, Feine J. Nutritional and anthropometric analysis of edentulous patients wearing implant overdentures or conventional dentures. Braz Dent J. 2008;19(2):145-50.

Source of support: Nil **Conflict of interest:** None declared