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ORIGINAL ARTICLE

Evaluation of effect of Complete Dentures on Respiratory Performance: A Clinical Study

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***ABSTRACT*:**
Background: The loss of teeth can impair function, esthetics and phonation and is restored most of the time with prosthesis. Data from the past literature have shown that complete dentures do have some significant effect on the respiratory performances of the patients. Under the light of above mentioned data, we planned the present study to assess the impact of complete dentures on functioning of respiratory system. **Materials & Methods:** The present study included spirometric assessment of effect of complete dentures on respiratory performance. We evaluated a total of 50 subjects and evaluated their respiratory functions.Patients were not allowed to performance any physical activity 2 hours before the starting of the study. Testing of respiratory functions was done at following stages: In absence of denture, and in the presence of denture. Forced vital capacity (FVC) was measured in all the patients and values were recorded on excel sheet. Comparison in between the values obtained at different stages was done using SPSS software. **Results:** A total of 50 patients were included in the present study. Significant results were obtained while comparing the respiratory functional test in patients while wearing dentures and while in the absence of dentures. **Conclusion:** Wearing of complete dentures does affect the respiratory performance of the patients.
Key Words: Complete denture, Edentulism, Spirometry.

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INTRODUCTION

The loss of teeth can impair function, esthetics and phonation and is restored most of the time with prosthesis. Although preventive dentistry helps protecting teeth, the demand for prosthodontic treatment is expected to rise even in developed countries as a result of a rapid increase in their elderly population.[1-3] Many countries are facing an aging population, which will cause a ratio of individuals over 65 years of age up to 50% in the coming decades.[4- 6]Data from the past literature have shown that complete dentures do have some significant effect on the respiratory performances of the patients.[7- 9]Under the light of above mentioned data, we planned the present study to assess the impact of complete dentures on functioning of respiratory system.

MATERIALS & METHODS

The present study was planned in the department of prosthodontics of the dental institute and included spirometric assessment of effect of complete dentures on respiratory performance. Ethical approval was taken from institutional ethical committee and written consent was obtained from all the subjects after explaining in detail the entire research protocol. We evaluated a total of 50 subjects and evaluated their respiratory functions. Patients were not allowed to performance any physical activity 2 hours before the starting of the study. Only edentulous patients were included in the present study. Diagnostic spirometer was used for carrying out the spirometric test at different stages of each subject. Testing of respiratory functions was done at following stages:

- In absence of denture
- In the presence of denture

Forced vital capacity (FVC) was measured in all the patients and values were recorded on excel sheet. Comparison in between the values obtained at different stages was done using SPSS software. Chi- square test, fisher t test and one way ANOVA were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

A total of 50 patients were included in the present study. Out of which, 29 were males and 21 were females. The mean age of the patients was 53.5 years while the mean weight was 57.2 Kg. significant results were obtained while comparing the respiratory functional test in patients while wearing dentures and while in the absence of dentures.

Table 1: Demographic details of all the subjects

Parameter		Number
Mean Age (years)		**53.5**
Gender	**Males**	**29**
	Females	**21**
Mean weight (Kg)		**57.2**

Table 2: Comparative evaluation of spirometric values with and without dentures

Comparative evaluation of spirometric values	P- value
Absence of denture- FVC &Presence of denture – FVC	0.02*

*: Statistically significant

DISCUSSION

In the present study, we analysed a total of 100 subjects and evaluated the effect of various oral conditions (with and without dentures) on the respiratory performance. We observed significant effect of denture wearing on spirometric values in edentulous patients. Piskin B et al determined influences of complete dentures on spirometric parameters in edentulous subjects. A total of 46 complete denture wearers were included in this study. Respiratory functions of the subjects were evaluated by spirometric tests that were performed in four different oral conditions: without dentures (WOD), with dentures, lower denture only and upper denture only. Forced vital capacity (FVC), peak expiratory flow, forced expiratory volume in 1 s and forced expiratory flow between 25% and 75% were evaluated. The data were analyzed with Friedman, Wilcoxon and paired-samples t tests ($\alpha = 0.05$). Significant differences were found between spirometric parameters in different oral conditions ($p < 0.05$). In all spirometric parameters, the most important significant differences were found between conditions WOD, FVC and with lower dentures (FVC), and WOD (forced expiratory volume in 1 s) and with upper dentures (forced expiratory volume in 1 s). It was observed that complete dentures may unfavourably affect spirometric values of edentulous subjects. However, current findings need to be confirmed with advanced respiratory function tests.[9]

Bucca CB et al compared the values of FVC, FEV(1), PEFR, FEF(50%), FIV(1), and FIF(50%) recorded with and without dentures in three groups of edentulous subjects: 36 asymptomatic subjects with normal spirometry (N), 22 patients with chronic obstructive pulmonary disease (COPD), and 18 with interstitial lung disease (ILD). In 14 subjects retropharyngeal space with and without dentures was assessed by cephalometry. Subjects with N and ILD had significantly lower airflow rates without dentures, whereas subjects with COPD had no significant difference in spirometric values recorded with or without dentures. The retropharyngeal space was significantly decreased by removing dentures (from 1.52 +/- 0.07 to 1.16 +/- 0.09 cm, SEM, $p < 0.0001$). These findings indicate that in edentulous subjects with a normal or restrictive pattern, the recording of flow-volume curves with or without dentures produces small but significant differences. Although such differences do not appear to have clinical significance, the fact that when dentures are used some respiratory flows are higher would favor the use of dentures in edentulous subjects during spirometric evaluation.[10]Carossa S et al studied whether edentulism, by causing a decrease in size and tone of pharyngeal musculature, may affect spirometric measurements. Spirometry was recorded with and without dentures in 58 edentulous subjects, 36 asymptomatic normal subjects (N) and 22 patients with chronic obstructive pulmonary disease (COPD). In 10 subjects retropharyngeal space with and without dentures was assessed by cephalometry. In the N group, removing dentures produced a significant decrease in lung volumes and airflow rates, while in COPD patients it was ineffective. In both groups, retropharyngeal space was significantly decreased by removing dentures. Edentulism, by decreasing extrathoracic airway caliber, influences significantly spirometric measurements in normal subjects but not in those with COPD.[11]Majumdar S et al assessed the spirometric functions. The patients and controls (n=10) each for male and female groups were subjected to spirometry using computerised electronic spirometer while exercise tolerance was evaluated by modified Harvard step test. In patients suffering from type 2 diabetes mellitus (n=4), post-tuberculous group (n=7), hypothyroid (n=6), collagen vascular disease group (n=6) showed restrictive spirometric pattern and the above groups including IHD patients showed significant reduction in exercise tolerance values. Some authors have stated that mixed ventilatory defect is characterised by low FEV1/FVC% in spirometry and low lung volumes where the lung volumes have to be ascertained by other methods but in the present investigation it was observed that mixed ventilatory defect can be estimated by spirometry; PEFR and/or FEF(25-75%). pred <70% whereas FEV1/FVC% pred is normal or supernormal. This finding is completely new one to predict mixed ventilatory defect.[12]

CONCLUSION

FCV is affected by wearing of complete denture in edentulous patients. However; future research is recommended.

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