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Original Article

Prevalence of Different Signs of Combination Syndrome among Denture Wearers of Jammu Population

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ABSTRACT

Aim: The aim of the study was to determine the prevalence of different signs of combination syndrome among denture wearers of Jammu population.

Materials and Methods: The present study was conducted in the Department of Dentistry at District Hospital, Kathua, Jammu, from May 2016 to October 2016. From a total of 376 patients, 113 patients were selected for the study based on the inclusion criteria. Patients were examined for the extrusion of the mandibular anterior teeth (EA), tuberosity overgrowth (TO), mandibular posterior bone resorption (MPR), bone resorption in maxillary anterior region (MAR), and palatal papillary hyperplasia (PPH). Chi-square test was used to interpret the evaluated data.

Results: The majority of the subjects have shown the presence of different signs of combination syndrome with 78.7% of the subjects showing MPR, 66.4% subjects having bone resorption in MAR, 63.7% of the subjects showed EA, and 56.6% showed TO. The least prevalent sign was PPH which was shown to be 15.04%. The results were statistically highly significant. The subjects showing the presence of different signs of combination syndrome 65.3% of males and 34.7% females showed EA, 39.1% males and 60.9% females showed TO, 53.9% males and 46.1% females showed MPR, and 49.3% males and 50.7% females showed MAR. PPH was present in 47.1% males and 52.9% females. The gender differences for the presence of different signs of combination syndrome were found to be statistically significant.

Conclusion: The combination syndrome was prevalent in 30.05%. The clinical signs of combination syndrome are quite prevalent with least prevalence for PPH. Appropriate evaluation of patients after giving prostheses should be done to minimize the occurrence combination syndrome.

Key words: Combination syndrome, Denture, Prevalence, Removable partial denture

INTRODUCTION

The Glossary of prosthodontic terms defines combination syndrome as a set of characteristics that occur when an edentulous maxilla is opposed by mandibular anterior teeth.[1] Kelly, in 1972, introduced the term combination syndrome when analyzing six patients wearing a maxillary complete denture (CD) occluding with a distal extension removable partial denture (Kennedy Class I removable partial denture [RPD]).[2] The characteristic features of this syndrome include loss of bone from the anterior portion of the maxillary ridge, overgrowth of the tuberosities, papillary hyperplasia of the mucosa of the hard palate, extrusion of mandibular anterior teeth, and loss of alveolar bone, and ridge height beneath the removable partial denture bases. Some years later, new features were attributed to combination syndrome: Loss of vertical dimension of occlusion, occlusal plane discrepancies, spatial repositioning of the mandible in the anterior region, poor denture and periodontal alterations.[3]

Although Kelly[2] mentioned the use of an adequate removable partial denture as a way to prevent the development of signs of the syndrome, the scientific evidence on this effect is still limited.

According to Kelly, the loss of bone from the anterior part of maxillary jaw is the key to the other changes of combination

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syndrome. The changes in tissue form and health were seen in this syndrome can be attributed to several factors, one of which is the biomechanical factor. When mandibular anterior teeth are present, patients tend to favor these teeth functionally because of the ability to generate maximum force. Excessive anterior function and parafunction in excursive movements constantly overload the anterior ridge to result in alveolar bone resorption and possible development of epulis fissuratum.

Shen and Gongloff in 1989, reviewed records of 150 maxillary edentulous patients. Among patients who had completed maxillary dentures and mandibular anterior natural teeth, one in four demonstrated changes consistent with the diagnosis of combination syndrome.[4]

When planning treatment for patients with edentulous maxillae and a partially edentulous mandible, the risk of development of the combination syndrome must be recognized.[3]

Saunders *et al.*[3] in 1979 stated that the basic treatment objective in treating these patients is to develop an occlusal scheme that discourages excessive occlusal pressure on the maxillary anterior region (MAR), in both centric and eccentric positions. Some specific treatment objectives stated were that the mandibular removable partial denture should provide positive occlusal support from the remaining natural teeth and have maximum coverage of the basal seat beneath the distal extension bases. The design should be rigid and should provide maximum stability while minimizing excessive stress on remaining teeth. The occlusal scheme should be at a proper vertical and centric relation position. Anterior teeth should be used for the cosmetic and phonetic purpose only. The posterior teeth should be in balanced occlusion.

In 1985, Schmitt[5] described a treatment approach that attempted to minimize the destructive changes, using the treatment objectives of Saunders *et al*.

In 2001, Wennerberg *et al*. reported excellent long-term results with mandibular implant-supported fixed prostheses, opposing maxillary CD.[6]

Palmqvist *et al*. in 2003, also reviewed the literature on the combination syndrome and related features such as alveolar bone loss, bone resorption, maxillary tuberosities, denture stomatitis, and maxillary abnormalities, all combined with removable partial denture variables.[7]

The aim of the present study is to determine the prevalence of different signs of combination syndrome among denture wearers of Jammu population.

MATERIALS AND METHODS

The present study was conducted in the Department of Dentistry at District Hospital, Kathua, Jammu, from May 2016 to October 2016. From a total of 376 patients, 113 patients having combination syndrome were selected for the study based on the inclusion criteria.

Inclusion Criteria

The following criteria were included in this study:

- Patients having edentulous maxilla wearing maxillary denture.
- Patients having partially edentulous mandible wearing mandibular removable partial denture (Kennedy Class I).
- Patients using the prostheses for not <1 year.
- Patients showing signs of combination syndrome.

Exclusion Criteria

The following criteria were excluded from the study:

- Completely edentulous patients.
- Patients with any systemic disease.

Patients were Examined for the following Signs of Combination Syndrome

1. Extrusion of the mandibular anterior teeth (EA).
2. Tuberosity overgrowth (TO).
3. Mandibular posterior bone resorption (MPR).
4. Bone resorption in MAR.
5. Palatal papillary hyperplasia (PPH).

The obtained results were subjected to statistical analysis using SPSS version 20 $P < 0.05$ was considered statistically significant.

RESULTS

Table 1 summarized that majority of the subjects have shown the presence of different signs of combination syndrome with 78.7% of the subjects showing MPR, 66.4% subjects having bone resorption in MAR, 63.7% of the subjects showed EA, and 56.6% showed TO. The least prevalent sign was PPH which was shown to be 15.04%. The results were statistically highly significant ($P = 0.0000$***) Table 2 summarized that among the subjects showing the presence of different signs of combination syndrome 65.3% of males and 34.7% females showed EA, 39.1% males and 60.9% females showed TO, 53.9% males and 46.1% females showed MPR, and 49.3% males and 50.7% females showed MAR. PPH was present in 47.1% males

Table 1: Prevalence of different signs of combination syndrome

Signs	*n* (%)		
	Present	Absent	Total
EA	72 (63.7)	41 (36.3)	113 (100)
TO	64 (56.6)	49 (43.4)	113 (100)
MPR	89 (78.7)	24 (21.3)	113 (100)
MAR	75 (66.4)	38 (33.6)	113 (100)
PPH	17 (15.04)	96 (84.96)	113 (100)

χ^2=108.421, df=4, χ^2/df=27.11, P (χ^2>108.421)=0.0000***. EA: Extrusion of the mandibular anterior teeth, TO: Tuberosity overgrowth, MPR: Mandibular posterior bone resorption, MAR: Maxillary anterior region, PPH: Palatal papillary hyperplasia

Table 2: Prevalence of different signs in different genders with presence of combination syndrome

Signs	*n* (%)		
	Males	Females	Total
EA	47 (65.3)	25 (34.7)	72 (63.7)
TO	25 (39.1)	39 (60.9)	64 (56.6)
MPR	48 (53.9)	41 (46.1)	89 (78.8)
MAR	37 (49.3)	38 (50.7)	75 (66.4)
PPH	8 (47.1)	9 (52.9)	17 (15.04)

χ^2=9.891, df=4, χ^2/df=2.47, P (χ^2>9.891)=0.0423*. EA: Extrusion of the mandibular anterior teeth, TO: Tuberosity overgrowth, MPR: Mandibular posterior bone resorption, MAR: Maxillary anterior region, PPH: Palatal papillary hyperplasia

and 52.9% females. The gender differences for the presence of different signs of combination syndrome were found to be statistically significant ($P = 0.0423$*).

DISCUSSION

The current study was conducted on 113 patients at District Hospital, Kathua, Jammu, fulfilling the inclusion criteria. Treatment of patients showing signs of combination syndrome is a challenging task for dental practitioners.[8]

The findings of our study showed 30.05% prevalence rate of combination syndrome, which is in accordance with the findings of Juturu *et al.*[9] However, Crum and Rooney in their study have found 27% prevalence rate.[10]

In the present study, MPR was found to be the most prevalent clinical sign and was shown by 78.8% of the subjects with combination syndrome. Similar findings were found by Resende *et al*. in their study.[11]

The quality of denture fit is an important factor that influences the presence of this clinical feature.[12] It has been stated by Tolstunov that bone is deposited and resorbed according to the tensions placed on it and the use of poorly fitted dentures for a prolonged period may contribute to this type of resorption.[13,14]

66.4% of the subjects showed maxillary anterior bone resorption which may be attributed to an increase in occlusal load in this region due to reduced mandibular posterior support. These findings are similar to the findings of Kelly.[2]

In this study, 56.6% subjects showed TO which is similar to the findings of Resende *et al.*[11] Shen *et al*. found a similar prevalence (56%) after evaluating patients with bilateral distally edentulous mandibular arches wearing a maxillary CD and a mandibular removable partial denture.

The least prevalent point in this study was PPH and was prevalent in 15.04% of the subjects. Similar results were found by Resende *et al*., MacEntee *et al*., and Xie *et al*. in their studies.[15,16]

In the current study, the extrusion of lower anterior was found in 63.7% of the subjects. However, Kelly observed extrusion in 100% of individuals during radiographic evaluation after a period of 3 years.[2]

The limitations of this study were that sample size was limited, and different age groups were taken into consideration, and all the data were collected at the same time without any follow-up. Further studies including these factors should be done on larger sample size for appropriate results.

CONCLUSION

It can be concluded that the combination syndrome was prevalent in 30.05%. The clinical signs of combination syndrome are quite prevalent with least prevalence for PPH. Appropriate evaluation of patients after giving prostheses should be done to minimize the occurrence combination syndrome.

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