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ORIGINAL RESEARCH

Evaluation of Oral Dysfunction in Completely Edentulous Denture Wearing Patients

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ABSTRACT

Background: Oral dysfunction is the difficulties faced by the complete denture wearers during speech mastication, pain and esthetics. By knowing this oral dysfunction we can make a satisfactory complete denture to the patient.

Aim: The aim of the study is to evaluate oral dysfunction in complete denture wearers using a Clinical Dysfunction Index.

Materials and Methods: Potential study participants were interviewed regarding their satisfaction with their complete denture after minimum three months of denture wear. The first twenty satisfied and unsatisfied complete denture wearers were recruited for the study. The data collection was done using a questionnaire and clinical examination was carried out to ascertain the quality of the denture based on stability, occlusion, articulation, oral mucosa and resilience. Clinical Dysfunction Index by Helkimo [1974] was used to assess the functional health of the Temporo-Mandibular joint.

Results: According to the results of our study fewer participants reported difficulty in chewing among those with correct articulation, correct occlusion and good retention of their dentures and more participants reported difficulty in chewing with dentures having incorrect articulation, incorrect occlusion and minimum retention

Conclusion: Knowledge about oral dysfunction in complete denture wearers can motivate us to pay careful attention to factors that may influence the satisfaction of complete denture wearers as observed from this study.

Keywords: Complete denture, oral dysfunction, retention

INTRODUCTION

Complete dentures for edentulous persons have reduced functions of the masticatory systems compared with individuals with a set of complete natural teeth[1].

The edentulous persons are in need of a complete denture due to loss of normal physiological function and psychological changes due to teeth loss. Chewing efficiency, for example, satisfactory masticatory function has been regarded in complete denture wearers due to reduced chewing efficiency[2]. Denture function has no close relation between denture quality and patient appreciation[3].

Change in position of the condyle in the mandibular fossae is due to change in vertical and horizontal mandibular position results in lack of complete denture for long period. Reduction of vertical dimension of occlusion may also occur

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when there is a change in rest position. Increased Temporo-Mandibular Disorder in edentulous patient caused by psychological and emotional factors associated with increasing age and loss of natural dentition[4].

A denture wearer's ability to comminute food during mastication are markedly reduced to 1/4 or 1/7 than that of adults with natural dentitions. It depends on the ages of the subjects and the types of food. Prolonging or increasing the number of chewing strokes in patients compensates for the loss of masticatory efficiency; they merely swallow larger food particles. Edentulous patients seem to lack appropriate discriminatory ability as chewing is a selective process[5].

Apart from the dentist's skill, many other factors, very important in achieving optimum retention and the stability of full dentures depends entirely on the patient[6]. There are some factors, which include adhesion and cohesion, viscosity and flow of saliva, the shape and degree of resorption of alveolar ridges, quality/quantity of alveolar bone, mineral density, resiliency of soft tissue, relationship between the upper/lower alveolar ridges, neuromuscular coordination, status of oral mucosa, depth of vestibular sulcus, and hypertrophy of the tongue[7].

Speech is created by sound which is produced by the larynx and further shaped by muscular changes in the oropharynx[8]. Flow of air to produce speech sounds is due to the interaction of the tongue, palate, lips, teeth, and jaws which is integral to the valving and articulatory process. An alteration in the position of the teeth or palatal contours can affect or interfere with speech, articulation and intelligibility can be made by denture[9].

Dentists and technicians on one hand, and patients on the other hand have difference of opinion concerning esthetics. One of the primary reasons for non-success of maxillary dentures is poor esthetics. Smile and appearance that suits the patient's physical character and esthetic needs must be created by dentist[10].

Prevalence of oral lesions was found in association between the time of complete denture wear, and lesions were mostly observed among longer periods denture wear[11].

Between the denture base and underlying bone presence of a layer of resilient submucosa permits moderate compressibility without mechanical impingement of the mucosa between. The fatty and glandular submucosa acts as a "hydraulic cushion" similar to the palm of the hand as described by Orban[12].

High prevalence of pain and tenderness to palpation is shown by lateral pterygoid, as compared to the remaining masticatory musculature in complete denture wearers. Instead of muscular pain and tenderness, five most frequently recorded signs, symptoms and/or manifestations of craniomandibular disorders which was noted in complete denture wearers are generalized parafunctional habits of pushing the tongue against the dentures, clenching and grinding, biting the soft tissues in the mouth and audible clicking in the TMJ were the five most frequently recorded signs, symptoms and/or manifestations of craniomandibular disorders in complete denture wearers[13]

Dense connective tissue of the lamina propria firmly binds the mucosa to underlying periosteum apart from some parts of masticatory mucosa which are without a distinct submucous layer. Although not as effective in providing resiliency, protective base for the mucosa under the complete denture is due to this connective tissue layer .[14]

Common findings in complete denture wearers are the incidence of temporomandibular disorders (TMD) and the presence of lesions in the oral cavity. When it presents lack of retention or when there is loss of vertical dimension to any extent it is considered to be totally useless. A complete denture is considered inadequate when it is unstable, resulting from either incorrect manufacturing or as a result of wear of artificial teeth and changes because of extended time of use.

Helkimo, 1974; Hansson &Nilner, 1975; Helkimo, 1976 suggested a higher incidence of functional disorders of the masticatory system in complete denture patients than was previously assumed. In spite of reports in the literature it is still generally believed that such conditions are rare in complete denture patients suffering from temporomandibular joint disturbances.

There are only few other studies regarding oral function in complete denture wearers. There are no recent studies which were done in South Indian population on oral dysfunction of complete denture wearers. Only few studies were done on the Temporo-Mandibular symptoms in complete denture wearers. Hence, this study is aimed to evaluate the functional parameters involved in denture use for a completely edentulous individual.

MATERIALS AND METHODS:

Forty participants were selected among complete denture wearers from the Department of Prosthodontics, Tagore Dental College and Hospital. Twenty patients are in one group with satisfactory complete dentures. The criteria for

selection of patients in this group considered their dentures to be satisfactory when examined over a period of 3 months (Bergman & Carlsson, 1972; Carlsson, 1974; Bates, Stafford & Harrison, 1976). The other group consisted of twenty patients who were not satisfied with their dentures and had presented for fabrication new dentures[1].

Inclusion criteria: Denture fabricated by single post graduate student under Standard Protocol and supervised by single supervisor. Angles Class 1 occlusion. Dentures in Centric Occlusion. Mucosa free of mucosal irritation and signs of inflammation. Exclusion criteria: Dentures which are not fabricated by single post graduate student. Not under standardized protocol or any special guidance. Class II and class III occlusion dentures. Patients with TMJ, arthritis and neuro- muscular disorder. All the patients were first time denture wearers. Sampling selection was done by convenience sampling. Informed consent was obtained from the patients before examination . Students '/'-test was used for testing differences.

QUESTIONNAIRE

The patients were asked questions by one of the authors about the masticatory function, phonetics and aesthetics and about symptoms of mandibular dysfunction[1].

CLINICAL EXAMINATION:

a) The clinical examination was performed and findings recorded in accordance with the principles outlined by Nyquist (1952)[3] for his investigation which included stability, occlusion, articulation, oral mucosa, resilience. Retention was recorded the methods suggested by Kapur[4] and Clinical Dysfunction Index was recorded for each patient.

Stability :To test the stability of the denture it was pressed lightly against its bed - with two fingers in the center of the denture base in Maxilla and in the premolar region of the denture in the mandible. An attempt was made to tip, rotate and/or displace it horizontally. The stability was assessed as satisfactory when no more than slight movements of the denture were caused. Defective stability was also recorded.

Occlusion: Centric occlusion was recorded as correct when there was inter-cuspation coinciding with centric relation, without premature contact on repeated habitual closing from the rest position and firm inter maxillary contact could be obtained in the lateral and anterior segments by means of metal spatula. Otherwise incorrect centric occlusion was recorded.

Articulation: Correct articulation was recorded when an examination with a metal spatula showed firm bilateral contact in lateral positions after gliding half the width of a premolar, and bilateral contact in protrusion position after forward gliding about 3 mm. Otherwise incorrect articulation was recorded.

Oral mucosa: The mucous membrane was recorded healthy when no clinical signs of an inflammatory reaction were observed. It was noted as inflamed when local/or general inflammation was observed in the palate or in the fore 1m-t of the mucosa of the alveolar process.

Resilience of alveolar process: The assessment was performed for the upper and lower jaws in accordance with the following scale;

Grade 1. - Mucosa taut over bone

Grade 2. - Top of ridge mobile against the bone

Grade 3. - One-half the height of the ridge or more mobile against the bone; and in cases where the alveolar process was absent.

Retention

3 (good) maximum resistance to vertical pull and sufficient resistance to lateral force

2 (moderate) moderate resistance to vertical pull little/no resistance to lateral force

1 (minimum)slight resistance to vertical pull and little/no resistance to lateral force

0 (no) displaced itself when seated

CLINICAL DYSFUNCTION INDEX

b) Recording the 'Clinical Dysfunction Index'

1. DjO denotes absence of the clinical symptoms of which the index is built up.
2. DiI denotes mild symptoms of dysfunction.1-4 of the following symptoms were recorded: deviations of the mandible in opening and/or closing movement >2 mm from a straight (sagittal) line, TMJ sounds (clicking or crepitation). Tenderness to palpation of the masticatory musculature in 1-3 palpation sites, tenderness to palpation laterally over the TMJ, pain in association with 1movement of the mandible, maximal mouth opening 30-39 mm, horizontal movements 4- 6 mm.
3. DiII denotes at least one severe symptom combined with 0 4 mild symptoms or 5 mild symptoms only. The severe symptom may be any of the following: locking/luxation of TMJ, tenderness to palpation in 4 sites or more of the masticatory musculature, tenderness to palpation posteriorly of the TMJ, pain in 2 or more movements of the jaw, maximal mouth opening <30 mm, one or more horizontal movements <4 mm.
4. DjIII denotes 2-5 of the severe symptoms possibly combined with any of the mild symptoms

RESULTS:

The results of the questionnaire, clinical examination and clinical dysfunction index are presented from Table 1 to 3 and Figure 1 to 5.

DISCUSSION:

According to the results of our study fewer participants reported difficulty in chewing among those with correct articulation, correct occlusion and good retention of their dentures and more participants reported difficulty in chewing with dentures having incorrect articulation, incorrect occlusion and minimum retention .Fewer participants were reported difficulty in speaking among those whose dentures had satisfactory stability as compared to those with defective stability .The study participants reported reduced occurrence of pain on wearing of complete denture with score of 0 in the dysfunction index .The occurrence of pain increased with score of 1 and 2 in the dysfunction index. Previous studies show that edentulous persons have compromised masticatory function[3]. Complete dentures are poor substitutes for a complete set of natural teeth and usually also functionally inferior when compared to normal natural dentition[5].

Table 1:Results Of Questionnaire

S.NO	QUESTIONS	YES	NO
1.	Do you chew as you wish?	19	21
2.	Do you usually chew on both sides?	18	22
3.	Do you bite hard food with your front teeth	12	28
4.	Are there any foods so difficult to chew that you avoid them?	22	18
5.	Have you now or have you had any difficulties in Speaking?	11	29
6.	Do you grind or clench your teeth?	4	36
7.	Do you wear your denture at night?	1	39
8.	Do you have pain anywhere in your face or jaws	19	21
9.	Have you had any of the symptoms described in question 8 previously	18	22
10.	How do you like the appearance of your dentures?	35	5

Table 2: Results of Clinical Examination

S. No						P Value
1.	**Stability**	**Satisfactory**	**Defective**			
	Participants	17	23			0.342782
2.	**Occlusion**	**Correct Occlusion**	**Incorrect Occlusion**			
	Participants	33	7			3.9405
3.	**Articulation**	**Correct Articulation**	**Incorrect Articulation**			
	Participants	26	14			0.05778
4.	**Oral Mucosa**	**Healthy**	**Inflamed**			
	Participants	29	11			0.004427
5.	**Resilience Grade**	**1**	**2**	**3**		
	Participants	11	25	4		0.000189
6.	**Retention Score**	**1**	**2**	**3**	**4**	
	Participants	11	15	10	4	0.102275

Table 3: Results of Clinical Dysfunction Index

DYSFUNCTION INDEX SCORE	1	2	3	4
PARTICIPANTS	12	13	12	3

Graphs

FIGURE 1

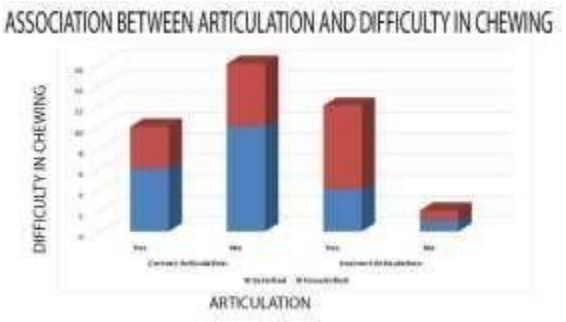


FIGURE 2:

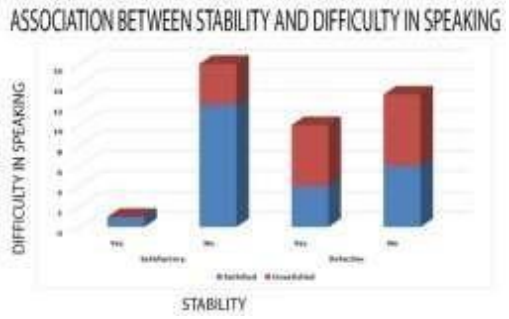


FIGURE 3

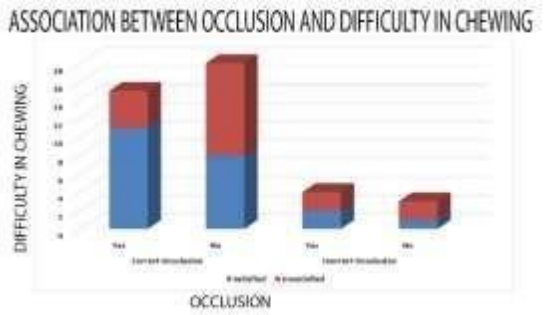


FIGURE 4

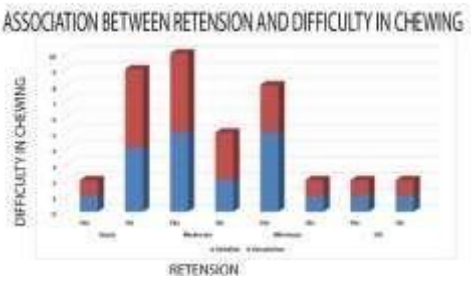
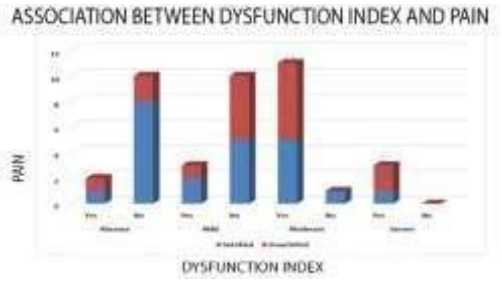


FIGURE 5:



Helkimo in 1974[2] conducted studies on function and dysfunction of masticatory system and found the same prevalence of dysfunction among 321 laps in northern Finland among men and women. Few small sex differences were found. Women had higher frequency of headache, pain and fatigue of jaws, while men reported more luxation of TMJ and increased para- function.

Haraldson et al 1979[1] evaluated oral function in complete denture wearers and found no significant difference between bite force in patients with satisfactory and unsatisfactory dentures. He also found little difference between the two groups regarding masticatory function.

Bergman in 1964[3] recorded the occlusion, articulation and stability of dentures and mucosal conditions of complete denture patients over a period of 2 years , found that a large number of dentures had lost correct occlusion and balanced articulation during the period of follow up Similar observation have be made regarding occlusion and articulation in other studies in 1959. He also found that 1/3 of the denture had determined in stability which he related to changes in denture bearing area. ‘

CONCLUSION:

Knowledge about oral dysfunction in complete denture wearers can motivate us to pay careful attention to factors that may influence the satisfaction of complete denture wearers such as denture retention, stability, occlusion and articulation.

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Conflict of Interest: Nil

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