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"COMPARATIVE EVALUATION OF NUTRITIONAL STATUS OF SHORTENED DENTAL ARCH PATIENTS WITH COMPLETELY DENTULOUS PATIENTS USING MINI NUTRITIONAL ASSESSMENT- SHORT FORM" - A CROSS- SECTIONAL STUDY.

1. Dr. Shanvi Agrawal
Postgraduate student (I MDS)
Department Of Prosthodontics and Crown & Bridge
Sharad Pawar Dental College and Hospital, Wardha
DMIMS, Sawangi, Wardha (Maharashtra), India
Email- ag.shanvi95@gmail.com
9589648888

2. Dr. Seema Sathe Kambala
Professor and Head
Department Of Prosthodontics Crown & Bridge
Sharad Pawar Dental College and Hospital, Wardha
DMIMS, Sawangi, Wardha (Maharashtra), India
Email- seemasathe2011@gmail.com
8888839833

Corresponding author's name and address:

Dr. Shanvi Agrawal
Department Of Prosthodontics And Crown & Bridge
Sharad Pawar Dental College and Hospital, Wardha
DMIMS, Sawangi, Wardha (Maharashtra), India

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Abstract

BACKGROUND: There are various people having dental arches with edentulous areas which are unrestored and are present posterior to the natural remaining teeth. Such people are known to have a SDA or Shortened Dental Arch. Individuals having SDA may consume a limited diet, containing highly processed& soft foods which can aggravate the possibility of obesity.

OBJECTIVE: In this study, we will evaluate the difference in the nutritional status of the patient with SDA as compared to completely dentulous patients and propose a desired intervention for such patients.

METHODS: This research will be executed at "Department of Prosthodontics, Sharad Pawar Dental College, Sawangi (Meghe) DMIMS DU, Wardha". Total 40 patients reporting to OPD with unrestored edentulous area posterior to natural teeth as well as completely dentulous patients will be included in this study .Nutritional assessment using "mini nutritional assessment- short form" is evaluated for every subject and compared.

RESULTS: It is expected that this study would provide an insight to the difference in the nutritional status of the patient with SDA as compared to completely dentulous patients and propose a desired intervention for such patients.

CONCLUSION- There are various people having dental arches with unrestored edentulous areas remaining distal to the remaining natural teeth. Such people are known to have a SDA or Shortened Dental Arch .Individuals having SDA may consume a limited diet, containing highly processed& soft foods which can aggravate the possibility of obesity. This study will aid in evaluating the difference in the nutritional status of the patient with SDA as compared to completely dentulous patients and propose a desired intervention for such patients.

Keywords: Nutritional status, Shortened Dental Arch, completely dentulous patient, Mini Nutritional Assessment Short Form (MNA-SF), BMI.

BACKGROUND-

There are various people having dental arches with edentulous areas which are unrestored and are present posterior to the natural remaining teeth. Such people are known to have a shortened dental arch or SDA. [1]

The pattern of SDA is considered under following situations-

1. There are six occluding pairs of anterior teeth
2. Edentulous area/areas remaining posterior to the most distal natural tooth present either unilaterally / bilaterally or edentulous areas with natural teeth remaining both anterior and posterior to it.
3. The edentulous areas which are unrestored. [1]

In some studies, concerning oral function with SDA, approximately 10 % of the patients examined complained of deterioration of chewing ability. It was concluded that if there are fewer than 10 pairs of occluding teeth, impairment of masticatory ability occurs.[2]

There are some studies that have shown the relationship between tooth loss and obesity stating that people having lack of teeth will have a restricted pattern of diet including highly processed foods which ultimately lead to the weight gain of the individual. [3]

Due to such restricted pattern of diet, there will be impairment of the nutritional status of the individual which ultimately affect the health of the patient. Many tools are available for the estimation of nutritional status of the individual. One of such assessment includes “Mini nutritional assessment- short form [MNA-SF]”. [4]

“BMI [Body Mass Index]”, a ratio of height to the weight, is also used widely to determine the obesity.[5]

As being overweight is associated with several health complications, & the likelihood of the SDA to cause obesity is still unknown, the SDA and the BMIis examined to check if there is any relationship between SDA & obesity.[1]

Patients having SDA may eat a restricted diet due to the lack of occluding units which may eventually lead to impairment of the nutritional quality of the patient. There are several policies working to enhance the nutrition for families as well as for communities. [6]
In this research, impairment or absence of it will be assessed using [MNA-SF].Hence, this study is planned to evaluate the difference in the nutritional status of the subject with SDA as

compared to completely dentulous patients and propose a desired intervention for such patients.

AIM: To evaluate Nutritional status of Shortened dental arch patients and completely dentulous patients using MNA-SF (Mini Nutritional Assessment- Short Form).

OBJECTIVES:

1. To evaluate the nutritional status of the patient with a shortened dental arch.
2. To evaluate the nutritional status of the patient with complete dentulous arch.
3. To compare both the groups.

METHODS:

ETHICAL ASPECTS:

The study approval has been acquired from the IEC (Institutional Ethical committee). The subjects involved will be informed regarding the study and signed consent will be obtained from the subjects before starting the study.

STUDY DESIGN: (Figure 2)

It is a type of cross sectional study that will be conducted in a span of three years.

PARTICIPANTS –Two groups are made

1- Patients having Shortened dental arches.
2- Patients having Completely dentulous arches.

DATA COLLECTION TOOLS – Questionnaire

EQUIPMENTS REQUIRED -

- Weighing scale
- Measuring tape/ Stadiometer
- MNA-SF Questionnaire

SAMPLE SIZE – 40 PER GROUP

PROCEDURE:

It is a type of cross sectional study, which will be carried out at "Department of Prosthodontics, Sharad Pawar Dental College, DMIMS DU Sawangi (Meghe), Wardha".

All the patients reporting to OPD with unrestored edentulous area posterior to natural teeth or edentulous areas with natural teeth remaining both anterior and posterior to it (SDA) and completely dentulous patients will be included in this study.

The subjects will be allocated into 2 groups, Group A and Group B. Group A will comprise of 40 subjects having Shortened Dental Arch (SDA) and Group B will comprise of completely dentulous patients.

Nutritional assessment using [MNA-SF] will be evaluated for every patient & compared. It is useful to assess patient's nutritional status and provide intervention as required. It consists of six questions including- (Figure 1)

1. Recent intake
2. Recent weight loss
3. Mobility
4. Recent acute disease or psychological stress
5. Neurophysiological problems
6. BMI

Score will be assigned for each question.

Score >11 – normal nutritional status

Score< 11 - possibility of malnutrition

INCLUSION CRITERIA- Patients with a shortened dental arch

- Completely dentulous patients

- 30-60 years of age

- Unrestored edentulous span

EXCLUSION CRITERIA- Completely edentulous patients

-Patients with various nutritional disorders such as scurvy, osteoporosis.

EXPECTED OUTCOME-

Nutritional status of Shortened dental arch patients and completely dentulous patients are evaluated using Mini Nutritional Assessment- Short Form & compared to assess patient's nutritional status and provide desired intervention as required.

Statistical analysis will be performed using inferential& descriptive statistics using chi-square test & students t-test (unpaired). Software executed in the analysis will be SPSS 22.0 & Graph Pad Prism 7.0 version & $p<0.05$ is considered as level of significance.

DISCUSSION:

As stated by **Kayser AF** in 1981, According to the symmetry & degree of the condition of Shortened dental arch, it was classified into six classes. The outcome of the study showed change in oral functions into two patterns: the functions that progressively change without a sudden change & the functions that gradually change until four occlusal units are left and then change rapidly. The conclusion of the study was, adequate adaptive capacity was present to maintain the adequate oral function in SDA patients when there are four occlusal units left, mostly in a symmetrical position.[6]

Witter DJ et al in 1994 conducted a clinical study of 6-year follow-up in which completely dentulous arches patients are compared with SDA patients in the absence of molar support, with respect to items relating to oral comfort & craniomandibular dysfunction. The conclusion of the study was: (i) Shortened Dental Arch containing 3 to 5 occlusal units was not a possible risk for craniomandibular dysfunction and was able to offer enough oral comfort for a long period of time; and (ii) in Shortened Dental Arch patients, fabricating a free end RPD in the mandibular jaw did not improved the oral comfort & did not prevent craniomandibular dysfunction.[7]

In 1999, **Witter DJ et al** conducted a research which indicated that oral functional demands can be achieved with Shortened Dental Arch's comprising the anterior & premolar teeth for a long-term period. Several studies suggest that the concept of Shortened Dental Arch reduces complex restorative procedures in the molar regions & replacement of the posterior teeth that were absent is not necessary. Preserving the functionally strategic parts of the dentition & avoiding the overtreatment with associated costs and questionable benefits should be the main area of focus. [8]

A study conducted in 2003 by **Paulo TN** et al had an objective to study the chewing ability in patients with SDA in Tanzanian. Masticatory ability is extremely impaired in shortened dental arches having only 0 to 2 pairs of occluding premolars. In SDA with 3 to 4 pairs of occluding premolars & asymmetrical arches, masticatory ability is impaired. And In SDA with intact premolar regions & at least one pair of occluding molars provide sufficient masticatory ability.[9]

Fernandes VA, Chitre V in 2008 suggested that adequate adaptive capacity was present in Shortened dental arch patients when at least four occluding pairs were present (occluding premolars or occluding molars, corresponds to two units). This advocates that according to age & several other factors, the least number of pairs of occluding teeth essential for providing adequate oral function may vary.[10]

Around 2015, **Wiener RC, Wiener MA** stated a relationship between Shortened dental arch and BMI. In this research, second premolar occlusion with occluding anterior teeth & eight types of Shortened dental arch, either in combination or individually, were studied in association with Body Mass Index.[1]

Patients having Shortened Dental Arch may eat a restricted diet due to the lack of occluding units which may eventually lead to impairment of the nutritional quality of the patient. In this research, impairment or absence of it will be assessed using [MNA-SF]. Hence, this study is planned to evaluate the difference in the nutritional status of the subject with SDA as compared to completely dentulous patients and propose a desired intervention for such patients.

REFERENCES:-

[1] Wiener RC, Weiner MA. Shortened dental arch and body mass index in adults 45–65 years of age: results from National Health and Nutrition Examination Survey 2005–2008. International Dental Journal 2015; 65: 277–282

[2] Witter DJ, Cramwinckel AB, Van Rossum GMJM et al. Shortened dental arches and masticatory ability. J.Dent 1990;18:185-189

[3] Bernardo C, Boing AF, Peres KG et al. Association between tooth loss and obesity in Brazilian adults: a population-based study. Rev SaúdePública 2012;46(5):834-42

[4] McKenna G, Allen PF, O'Mahony D et al. Impact of tooth replacement on the nutritional status of partially dentate elders. Clin Oral Invest 2015

[5] Misra A, Dhurandar NV. Current formula for calculating body mass index is applicable to Asian population. Nutrition and diabetes (2019)9:3

[6] Uddin S, Mahmood H, Senarath U et al. Analysis of stakeholders networks of infant and young child nutrition programmes in Sri lanka, India, Nepal, Bangladesh and Pakistan. The Author(s) BMC Public Health 2017, 17(suppl 2):405

[7] KayserAF . Shortened dental arches and oral function. *J Oral Rehabil*1981; 8, 457-462

[8] Witter DJ, De HaanAFJ ,Kayser AF .A 6-year follow-up study of oral function in shortened dental arches. Part II: Craniomandibular dysfunction and oral comfort. J Oral Rehabil 1994,21:353-366

[9] Witter DJ, Van PH, Creugers NHJ et al. The shortened dental arch concept and its implications for oral health care. Commun Dent Oral Epidemiol 1999; 27: 249–58

[10] Sarita PT, Witter DJ, Kreulen CM et al .Chewing ability of subjects with shortened dental arches. Commun Dent Oral Epidemiol2003;31:328-34

[11] Fernandes VA, Chitre V. The shortened dental arch concept: A treatment modality for the partially dentate patient. The J Indian ProsthodontSoc 2008 ,Vol 8, Issue 3

FIGURE 1-

MINI NUTRITIONAL ASSESSMENT- SHORT FORM (MNA-SF)

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F1 Body Mass Index (BMI) (weight in kg) / (height in m^2)
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater ☐

Screening score (max. 14 points)

12 - 14 points: Normal nutritional status
8 - 11 points: At risk of malnutrition
0 - 7 points: Malnourished ☐☐

FIGURE 2

STUDY DESIGN