

A Study of Oral Stereognostic Proficiency in Dentulous and Edentulous Participants

Anam Saiyed^{1*} Somil Mathur² Rakesh Makwana³ Meena Shah⁴ Snehal Upadhyay⁵ Trishala Patel⁶

¹PG Student, Department of Prosthodontics, Dharmsinh Desai University, Nadiad, Gujarat, India.

²Professor and Head, Department of Prosthodontics, Dharmsinh Desai University, Nadiad, Gujarat, India.

³Reader, Department of Prosthodontics, Dharmsinh Desai University, Nadiad, Gujarat, India.

⁴Reader, Department of Prosthodontics, Dharmsinh Desai University, Nadiad, Gujarat, India.

⁵Reader, Department of Prosthodontics, Dharmsinh Desai University, Nadiad, Gujarat, India.

⁶Senior Lecturer, Department of Prosthodontics, Dharmsinh Desai University, Nadiad, Gujarat, India.

ABSTRACT

Background: Stereognosis means the ability of a person to recognize the shape and surface characteristics of an object using tactile sensations, without looking at them. The purpose of this study was to determine and compare the oral stereognostic ability in dentulous and edentulous participants.

Materials and Method: In this study, oral stereognostic ability was tested in 20 edentulous and 20 dentulous participants with the aid of silicone putty referred as test forms, fabricated in three basic shapes cube, sphere and pyramid of specific dimensions. Participants were informed not to open the eyes before placement of the sample in the mouth to avoid the risk of cross-matching of shape by the participant. One of the silicone putty test form was then randomly selected and placed in the subject's mouth. The subject was then asked to identify the shape by marking it on the evaluation sheet.

Result: The result showed that both dentulous and edentulous participants were able to identify the sphere shape more than the cube and pyramid shape.

Conclusion: The participants of both the groups were able to identify the putty moulded as sphere as it was well rounded and without sharp line angles whereas the participants got confused in the pyramid and cube shape forms which had line angles.

Keywords: Oral Stereognostic, Oral health, Dentulous and Edentulous.

INTRODUCTION

Stereognosis or recognition of shape involves, the most elaborate function subserved by the parietal cortex of the brain. This function requires the perfect reception of the impulses by the stimuli from the object. The sensations produced are synthesized in the cortex and compared with previous similar sensory memories. Oral stereognosis involves a certain amount of motor activity like manipulating the object within the mouth and feeling its surfaces with lips, tongue, teeth and palate. The information obtained must be

associated with oral sensory memories derived from visual and tactile experiences.¹

Classification of stereognosis is done in four different ways:

- a) General stereognosis: Overall capacity to recognize the shape of objects
- b) Homo stereognosis: Self body recognizing capacity, e.g., palate, tongue

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*Correspondence Dr. Anam Saiyed.

Department of Prosthodontics, Dharmsinh Desai University, Nadiad, Gujarat, India.

Email: anamsaiyed29@gmail.com

c) Organ stereognosis: Capacity to recognize muscular units as target areas, e.g., position of limbs to execute routine tasks

d) Hetero stereognosis: Capacity to recognize foreign body inside the oral cavity, e.g., glass particles, wood stick.²

The aim of the present study was to evaluate the oral stereognostic capability of the participants based on different 3-Dimensional geometric shapes placed in the mouth. Null hypothesis states that there would be no difference in stereognostic ability between dentulous and edentulous participants.

MATERIALS AND METHOD

40 participants were randomly selected from the patients who reported to the Department of Prosthodontics and Crown and Bridge-work and Oral Implantology, Faculty of Dental Science, Dharmsinh Desai University, Nadiad. The participants were divided into two groups of 20 participants each; Group 1 consisted of completely edentulous participants whereas group 2 consisted of completely dentulous and partially edentulous participants with at least 28 teeth present in the oral cavity. Participants were informed of the objective of the study and signed consent was obtained from the participants.

Oral stereognosis test was performed on both the groups using three different test samples. The shapes of the example were sphere (5 mm radius), cube (10*10*10 mm) and pyramid (10*10*10 mm). Shapes were initially prepared from a modelling wax (Y-DENTS no-2 modelling wax, MDM corp, India) in mentioned dimensions and then moulds of dental plaster (type 2, Kalabhai Kalaplast, India) were prepared from the wax models by flasking the wax model and dewaxing it. After the moulds were prepared, aquasil soft putty (Dentsply Sirona, DentsplyDetrey, Germany) was mixed according to the manufacturer's instructions and moulded into the desired shapes. After setting the material, it was removed and appropriately finished by cutting out the excess.

Participants were informed not to open the eyes before placement of the sample in the mouth to avoid the risk of cross-matching of shape by the participants.

RESULTS

The total number of entirely edentulous participants tested were 20 (group 1) out of which positive results given by participants for identifying the shape of the sphere were 20, the cube was 19 and pyramid was 15. Several edentulous participants responded negatively. Participants unable to determine the shape of the pyramid were 5 whereas for cube it was 1. (Chart I)

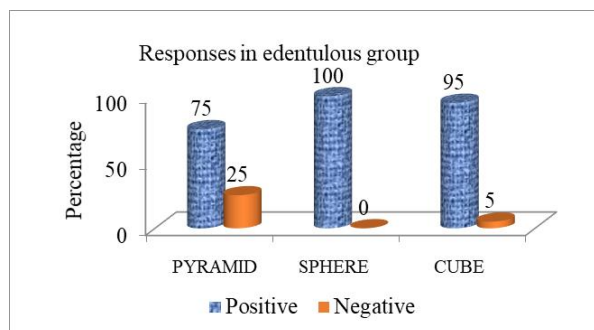


Chart 1: Responses of oral stereognosis in the edentulous group.

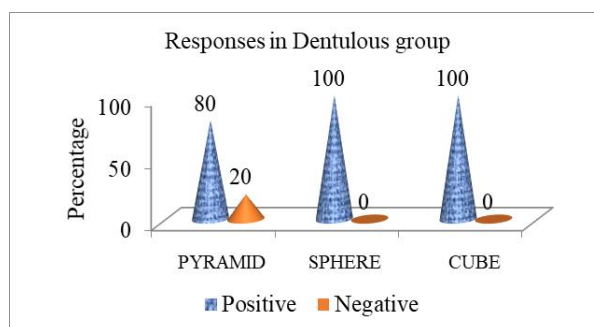


Chart 2: Responses of oral stereognosis in the dentulous group.

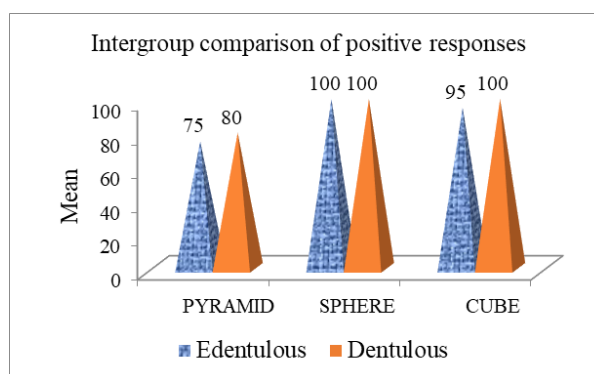


Chart 3: Intergroup comparisons of positive responses of oral stereognosis done in dentulous and edentulous participants.



Fig 1: Different 3-Dimensional shapes of the specimens.

The number of entirely dentulous participants under the experiment were also 20 (group 2) of which positive results acquired for identifying the sphere was 20, the cube was 20 and the pyramid was 16. The negative results given by the dentulous participants was only in identifying the shape of a pyramid where the score obtained was 4. (Chart II)

Chart III shows the intergroup comparison of the positive responses of the oral stereognosis amongst the group 1 and group 2.

DISCUSSION

Oral stereognosis basically is the ability of our sensory mechanism to recognize the shape of objects placed in the oral cavity. The science of stereognosis is essential for the dentist as well as a technician in order to understand the acceptance level of the participants and predict the acceptance and overall success of the prosthesis³. The null hypothesis was proved correct here that there was no difference in stereognostic ability in between dentulous and edentulous participants.

Chart I showed result of edentulous group where the positive response percentage for pyramid was 75%, for sphere it was 100% and for cube it was 95%, whereas the negative response percentage for pyramid was 25%, for sphere it was 0% and for cube it was 5%. The results were not statistically significant (P value 0.068). Chart II showed the responses in dentulous group in which the positive response percentage for pyramid was 80%, for sphere it was 100%, and for cube it was also 100%. The negative response percentage for pyramid it was 20% and for sphere and cube it was 0. The results were not statistically significant (P value 0.188). Chart III shows the result of comparison of positive responses in both groups which was also statistically not significant.

Ikebe et al⁴ and Agarwal et al⁵ conducted similar studies and found dentulous patients to have more stereognostic potential. A survey by Landt and Fransson⁶ stated that elderly people have less stereognostic capability than the younger adults due to weakening of the sensory feedback mechanism

CONCLUSION

In this study, oral stereognostic ability was found to be almost equal in edentulous participants and dentulous participants. The most identifiable shape for the participants was the sphere and the least was the pyramid. Hence, one can refer that if the dentures are made well rounded and polished correctly, the patient would be more comfortable wearing it rather than prostheses with sharp line angles.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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