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Original Research

Oral Stereognosis In Dentulous And Edentulous Patients: An Original Study

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ABSTRACT

Introduction: Oral stereognosis basically is the ability of our sensory mechanism to recognize the shape of objects placed in oral cavity.

Subjects and methods: This study was carried out on 100 selected patients.The patients were divided into two different groups. One group being dentulous and the other being edentulous. Four types of different test samples were cured in heat cured resin and placed in patients mouth. The geometric designs were drawn on the chart paper and marked as 1-4. A time period of 1 min was provided to each patient for the identification on the chart followed by gap of 30 s for the next test sample to be placed in the mouth. A score of 5 was given for each correct identification, score of 3 for no identification, and score of 1 for wrong identification of sample.

Results: In Inter group comparison, group 1 recorded mean values of 15 ± 0.43 where as group 2 recorded 18 ± 0.64. In intragroup comparison of group 1, males recorded mean score of 16 ± 0.33 where as females recorded mean score of 14 ±0.13. In intragroup comparison of group 2, males recorded mean score of 19 ± 0.33 where as females recorded mean score of 18 ±0.13. The data was found to be statistically significant. ($p<0.001$)

Conclusion: Oral stereognosis predicts the prognosis of the treatment provided. Edentulous patients have decreased stereognostic activity. Oral stereognostic ability was found to be less in edentulous patients than dentulous patients. In dentulous patients, no significant difference between males and females was found but in edentulous, significant differences do exist between male and female population of Jammu region.

INTRODUCTION

Rehabilitation of a prosthodontic patient is a tough job and needs immense patience, training and commitment by both the patient and the doctor. The dentist has to deal with neuro muscular conditions, mental attitude and morphological alterations of the patient and deal accordingly. Sometimes, the experience to fabricate the prosthesis leads to frustration rather than rewarding experience for both the patient and the dentist. Factors like behavior, expectations, adaptability of the patient play a vital role in predicting success of any dental prosthesis. MM House[1] classified patient's behavior in four different types and stated only philosophical and exacting types fit for carrying out prosthodontic treatment. Neuro muscular control of the patient also plays a major role in success of the treatment rendered.[2] The study of this neuro muscular coordination is called as stereognosis.[3] Oral stereognosis also called as haptic perception or tactile gnosis is the ability of the oral mucous membrane to perceive and recognize the forms of objects placed in oral cavity.[4] Rossetti *et al*.[5] classified stereognosis in four different types:

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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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 oral cavity, e.g., glass particles, wood stick.

The aim of the present study is to evaluate the oral stereognostic capability of the subjects on the basis of different geometric shapes placed in the mouth. Null hypothesis state no difference of stereognosis in dentulous and edentulous patients.

Subjects and Method

The study was carried out on 100 selected patients that reported to the Indira Gandhi Government Dental College, Jammu. The study was approved by the college Ethical Committee, and the patients were divided into two groups, each having 50 patients. Group1 consisted of completely edentulous patients where as group 2 consisted of dentulous and partially edentulous patients. Patients were informed of the objective of the study and verbal consent was taken by the patients. (TABLE 1) Oral stereognosis test was performed on both the groups using four different test samples. 100 test samples of each shape were prepared in modeling wax (Maarc) and were cured in heat cured acrylic resin using compression molding technique. Heat cured samples were sand papered and polished to high finish. A hole was drilled in the center of the test sample using frenum relieving bur and floss of 10 cm length was tied to the test sample to avoid any risk of engulfment of the test sample by the subject. (Figure 1) Dimensions of all different test samples were multiplied by 10 and the geometric designs were drawn on card board of 20 cm in length and 15 cms in width and marked as 1-4 using a marker. (TABLE 2) A physiological scale of rating was formed for each patient. 5 marks were allocated for correct answering, 3 marks for not answering and 1 mark for wrong answering each question. Each patient was subjected to 4 questions for correct evaluation of shape and scores were allocated. A time period of 1 min was provided to each sample for the identification on the chart followed by gap of 30 s for the next test sample to be placed in the mouth. Total scores were calculated and data was analyzed statistically using analysis of variance.

Results

The mean values of the readings were calculated and interpretated. In Inter group comparison, group1 recorded mean values of 15 ± 0.43 where as group 2 recorded 18 ± 0.64. In intragroup comparison of group 1, males recorded mean score of 16 ± 0.33 where as females recorded mean score of 14 ±0.13. In intragroup comparison of group 2, males recorded mean score of 19 ± 0.33 where as females recorded mean score of 18 ±0.13. The data was found to be statistically significant. ($p<0.001$)

Discussion

Neuro muscular coordination is basicalloy the ability of the brain to control our reflexes and send motor impulses to the brain.[4] Temporomandibular joint, Periodontal Ligaments of teeth[6] and proprioceptive impulses in tongue and oral mucus membrane collectively control the neuro muscular response of the mouth. Oral stereognosis basically is the ability of our sensory mechanism to recognize the shape of objects placed in oral cavity.[7] The science of stereognosis is very important for the dentist as well as technician so that to understand the expectation level of the patients and predict the prognosis of the prosthesis. A defect or nonintegration of the proprioceptive changes can result in poor function or pathologic changes in the system.[4]

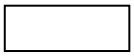
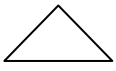
Null hypothesis stands rejected as a positive difference was found between males and females in terms of stereognostic potential.

100 different samples were fabricated in order not to repeat any sample and avoid the risk of cross contamination. Floss was attached to each sample to avoid any chance of sample engulfment. Patients were informed not to open the eyes before placement of sample in mouth so as to avoid risk of cross matching of shape by the patient. The scale[8] used in study is basically a standard protocol used by various physcolgical councilors to evaluate the behaviour of the patients. Four different shapes i.e. circle, Star, Square and triangle were used in the study to experience simple shape to complex figures for correct evaluations of the sterognosis of th e patients. In the present study, dentulous patients are found to have more stereognostic potential than edentulous patients in Jammu population. The reason may be attributed to the presence of the periodontal ligaments of teeth and less age leading to improved reflexes. Ikebe et al[9] and Agarwal et al[10] conducted similar studies and found dentulous patients to have more stereognostic potential leading to increased chances of success of prosthesis. This is also in agreement with the study by Landt and Fransson[11] which stated that elder people has less stereognostic capability than the younger adults due to weakening of sensory feedback mechanism. In intra group comparison in group 1, significant difference was found between males and females. Intragroup comparison of group 2 reveals no significant difference between males and females. Kale et al [12] conducted study to evaluate sterognosis in males and females and found males to have improved stereognostic ability than females. A study conducted by Chauvin and Bessette[13] reported that no difference exists in oral stereognosis between males and females which contradicts our present study. Further studies are directed towards conducting these studies and interlinking them with the EEG readings.[14]

Table 1: Inclusion criteria**.**

S No.	Inclusion Criteria
1.	Age less than 75 years.
2.	Absence of any systemic disease.
3.	Absence of psychiatric disease.
4.	More than 9 teeth in one arch in dentulous group.

Table 2: Different shapes used with dimensions

S NO.	Shape of sample	dimension	Diagram	Numbers
1	Circle	2 cm diameter		100
2	Rectangle	2*2 cm		100
3	Triangle	1.5*1.5*1.5 cm		100
4	Star	1cm each arm		100

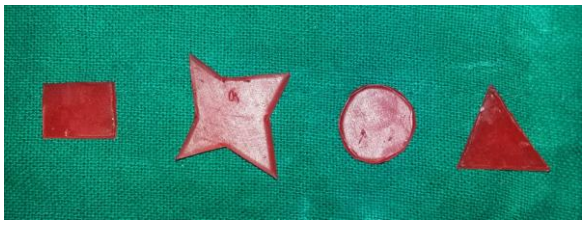


FIGURE 1

Conclusion

Within the limitations of the study, Oral stereognostic ability was found to be less in edentulous patients than dentulous patients. In dentulous patients, no significant difference between males and females was found but in edentulous, significant differences do exist between male and female population of Jammu region.

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