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Prosthodontics

A STUDY TO CORRELATE THE SKIN COLOUR OF FACE AND TOOTH SHADE VALUE IN THE POPULATION OF LUCKNOW - AN OBSERVATIONAL STUDY

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ABSTRACT

STUDY DESIGN: The importance of aesthetics in restorative dentistry has shown marked increase owing to new interest and public awareness. Colour is complex and encompasses both subjective and objective phenomena. Colour is a phenomenon of light (red, green, brown and yellow) or visual perception that permits the differentiation of otherwise identical objects and we should obtain an understanding of the scientific basis of colour as well as the artistic aspect of shade selection. The aim of the study was to correlate the skin colour of the face in Population of Lucknow and tooth shade value.

OBJECTIVE: To find out the prevalence of a particular tooth shade in a specific skin colour in a specific age group amongst the local population of Lucknow and the prevalence between the incidence of a particular tooth shade with specific skin colour in different age groups and the difference between them.

METHOD: This is a Randomized controlled study, consisting of 360 patients. The study is planned as selection of subjects, determining the Skin colour, determining the Shade of teeth. Subjects were divided into 3 age groups-Group 1:- 21 – 30 years, Group 2:- 31 – 40 years, Group 3:- 41 - 50 years. Skin tones divided into 3 categories: - Fair, Medium, Dark. Determination of the Skin Colour using Kryolan Supracolor Schminkpalette makeup shade guide. Recording of Shade of teeth using Vitapan 3D Master Shade guide. Teeth shades will be divided into 4 categories:- Highest Value group, high Value group, medium Value group, low Value group. The values of the reading were tabulated and subjected to statistical analysis.

RESULT: Within the limitations of this study, the results indicate that the skin colour can be used as a reliable guide for the artificial tooth colour selection in the absence of natural teeth. It also indicates that there is a significant relationship between tooth shade and skin colour.

CONCLUSION: Based on the relationships discovered in this study, skin colour may be a useful guide for the selection of tooth shade in removable and full-mouth reconstructions to achieve a more natural appearance, especially among the elderly and persons with darker skin tones.

KEYWORDS : Proper colour (hue), Translucence (value), VITA 3D-Master shade guide, Kryolan Supracolour makeup shades guide

INTRODUCTION

The success of aesthetic restorations depends primarily on the proper shade selection, and matching the correct tooth shade for anterior teeth is one of the most critical procedures[1]. Achieving perfect mimicry of the surrounding natural teeth thus becomes a crucial objective for dental practitioners and for patients[2]. G.V. Black's work, published in 1908, was the first reference in dental literature showing the importance of 'value' in the shade determination process. He stated that the best aesthetic result was obtained when the proper colour (hue) and translucence (value) were determined. He believed value was of greater importance than hue[3].

It is general misconception in people that white bright teeth are more attractive than yellow teeth[4]. Specifically, it is suggested that the brilliance (value) of the teeth must correspond to darkness or lightness of the facial skin tone while the hue must harmonize with facial colour and the colour saturation of the teeth colour must also correspond with the saturation of facial colour[5, 6]. Most authors favour the use of facial skin tones as a guide to tooth selection. Some have said people with fair complexions have teeth with less colour range

and colour saturation; thus, the teeth are lighter and in harmony with the colours of the face. Also, it has been said people with dark complexions generally have darker teeth that are in harmony with the colour of the face[6].

To improve shade matching, to provide a wider range of shades and to achieve more systematic ordering of the shade tabs, in 1998 VITA introduced the VITA 3D-Master shade guide (3D).With the 3D, the shade-matching process is no longer mere comparison of tooth colour with the colour of shade tabs. A laboratory study showed that shade matching with the 3D was more reliable, the reliability of shade matching with the 3D has been found to be superior among general practitioners[7].The objective of this observational study was to shed light on the prevalence of tooth shade and facial skin colour among population of Lucknow and to correlate the tooth shade with facial skin colour[8].

MATERIAL AND METHOD

This study was conducted to investigate the correlation exist between the skin colour of the face and tooth shade value in the population of Lucknow. For this study, three hundred and

sixty subjects belonging to different age groups compromising of both sexes were randomly selected amongst the students, hospital staff and patients. The study is planned as follows: - 1.Selection of subjects, 2. Determining the Skin, 3. Colour Determining the Shade of teeth. Subjects were divided into 3 age Groups: - **Group 1**- (21 – 30 years), **Group 2**- (31 – 40 years), **Group 3**- (41 - 50 years). Inclusion criteria: - **1.**The subjects included in the investigation had a full complement of maxillary and mandibular anterior teeth. **2.** Anterior healthy teeth were free from any type of restoration which is likely to change the colour of the teeth, crown replacement, developmental anomalies, fluorosis and similar conditions. Exclusion criteria: - **1.** Teeth that require or have endodontic therapy or restoration were excluded. **2.** Patient with active orthodontic appliances that interfere with shade selection. **3.** Those that have tanned their skin and have skin lesions on the face. **4.** Those whose histories do not include bleaching procedures, radiation therapy, xerostomia, tetracycline staining, abnormalities in tooth development, or smoking. The females subjects were especially asked not to wear lipstick or lip paint or bright makeup. Rapid shade selection was done to avoid fatigue of cones in the retina of the investigator.

DETERMINATION OF THE SKIN COLOR

Skin tones were divided into 3 categories with the use of Kryolan Supracolour makeup shades as a guide (fig. 1). Skin tones divided into 3 categories: -**1.**Dark (fig.2&3). **2.** Medium (fig. 4&5), **3.**Fair (fig. 6&7).

RECORDING OF SHADE OF TEETH

The shade selection procedure is preceded with a thorough oral prophylaxis of teeth. Tooth colour was obtained on examination of maxillary and mandibular left/right central incisors using Vitapan 3D Master Shade guide[9] (fig. 8). Shade selection was done in natural daylight, so as to obtain an adequate level of light intensity. Daylight is the eyes natural element and therefore the standard to which all sources are related. The subject was seated comfortably in an upright position with the mouth at the observer's eye level. A distance of two feet between the patient and the observer was maintained. Examinations were performed in a room with neutral coloured walls with natural light between 10 A.M. and 2 P.M. An individual shade tab was positioned directly beside the tooth under examination and compared to the middle third of the crown.

TEETH SHADES WILL BE DIVIDED INTO 4 CATEGORIES

- Highest Value group:-0M1, OM2, 0M3, 1M1, 1M2,
- High Value group:-2L1.5,2L2.5, 2M1,2M2,2M3,2R1.5,2R2.5
- Medium Value group:-3L1. 5, 3L2. 5, 3M1, 3M2, 3M3, 3R1. 5, 3R2. 5
- Low Value group:- 4L1. 5, 4L2. 5 4M1 4M2, 4M3, 4R1. 5, 4R2. 5, 5M1, 5M2, 5M3
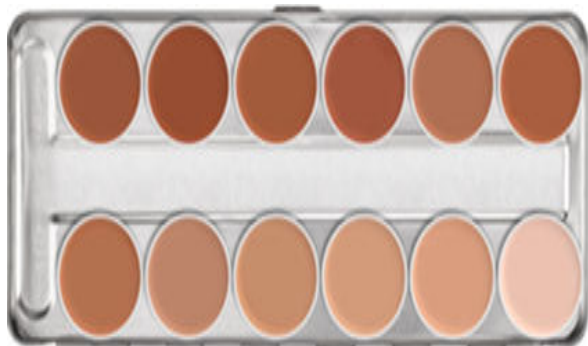- The values of the reading were tabulated and subjected to statistical analysis.

Fig 2

Fig 3

FIG 4

FIG 5

Fig.1- Kryolan Supracolor Makeup Shades

Fig 6

Fig 7

FIG 8

RESULT

Frequency of tooth shades. Out of the total of 360 subjects 35.83% was of the medium tooth shade and 25.27% were of high tooth shade. Only 17.22% of the subjects were of highest tooth shade. The highest proportion of the medium shades was found across all the age groups. **Frequency of skin colour.** Out of the 360 subjects there were total of 120 subjects in each of the skin shade i.e Fair, Medium and Dark. In each of the age group there were total of 40 subjects of each skin colour. **Association of skin colour with tooth shades in 21-30 years.** Among the fair subjects (40), the highest number of the subjects (45%) were having low tooth shade followed by medium (32.5%) and high (12.5%). Only 10% had highest tooth shade. In the people with medium skin colour, the 50% of the subjects reported medium tooth shade and only 5% had low tooth shade and 7.5% had highest tooth shades. In the subjects with the dark skin colour, the highest frequency was reported to be for the highest (50%) and high tooth shade (30%).The association between the skin colour and tooth shades was found to be statistically significant at $p \leq 0.05$ when analyzed using the Chi Square test.

Association of skin colour with tooth shades in 31-40 years. Among the fair subjects (40), the highest number of the subjects (57.5%) was having low tooth shade followed by medium (35%) and high (5%). Only 2.5% had highest tooth shade. In the people with medium skin colour, the 65% of the subjects reported medium tooth shade and only 5% had low tooth shade and 7.5% had highest tooth shades. In the subjects with the dark skin colour, the highest frequency was reported to be for the highest (45%) and high tooth shade (32.5%).The association between the skin colour and tooth shades was found to be statistically significant at $p \leq 0.05$ when analyzed using the Chi Square test.

Association of skin color with tooth shades in 41-50 years. In the subjects with the dark skin colour, the highest frequency was reported to be for the high (37.5%) and highest tooth shade (32.5%). Only 5% were having lowest tooth shades. Among the fair subjects (40), the highest number of the subjects (62.5%) was having low tooth shade followed by medium (35%) and high (2.5%). None of the subjects had highest tooth shade. In the people with medium skin colour, the 65% of the subjects reported medium tooth shade, 32.5% had highest tooth shades and only 2.5% had low tooth shade. The association between the skin colour and tooth shades was found to be statistically significant at $p \leq 0.05$ when analyzed using the Chi Square test.

Level of highest prevalence. - In the people with fair skin colour the prevalence of the lowest tooth shade was highest and it was 45% in the 21-30 years, 57.5% in the 31-40 years and 62.5% in the 41-50 years age group. The difference between the groups was statistically significant b/w all the three age groups when analyzed using the Chi Square test. In the people with Medium skin colour the prevalence of the Medium tooth shade was highest and it was 50% in the age group of 21-30 years and 31-40 years and 62.5% in the 41-50 years age group. The difference between the groups was statistically non- significant b/w the three age groups ($p \geq 0.05$).In the people dark skin colour the highest prevalence was found for the highest tooth shades in the age group of 21-30 years (50%) and 31-40 years (45%) whereas the prevalence was maximum for the high tooth shade in 41-50 years age group (37.5%). The difference between the groups was statistically significant b/w all the three age groups when analyzed using the Chi Square test.

DISCUSSION

LIMITATIONS: Within the limitations of this observational study following are some of the limitations which were observed during the course of the study: - 1. Judgement of tooth shade value by Vitapan 3D Master shade guide may differ by using any other type of shade guide such as Vita Classic shade guide. 2. Sample size for the present study may not truly represent the Indian population as regards to skin shade and tooth shade value. 3. Sequential observation in age variation is also a limitation.

FUTURE LEADS: There are certain areas where further studies can be conducted to achieve more conclusive results. These are: 1. Further research should be carried out with different shade guides available in the market to identify any other more accurate shade guide than the one used in the study. 2. Longitudinal studies must be conducted to assess the facial skin colour change as age advances. Also how tooth shade changes from young age to old age. 3. Multi Centric

study to get a better representation of different geographical population of India.

CONCLUSION

In the present "In-vivo" study a total of three 360 subjects belonging to different age groups by personnel visiting at Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow were selected. In this study subjects above 20 years with a full complement of maxillary and mandibular anterior teeth without any endodontic therapy or restorations, developmental defects and disease were selected, to determine the correlation between skin colour and shade of teeth. The objective of the study was to find out find out the prevalence of a particular tooth shade in a specific skin colour in a specific age group and also the prevalence between the incidence of a particular tooth shade with specific skin colour in different age groups and the difference between them amongst the local population of Lucknow.

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