International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: SJIF: 5.995
Available Online at www.journalijcar.org
Volume 6; Issue 10; October 2017; Page No. 6378-6380
DOI: http://dx.doi.org/10.24327/ijcar.2017.6380.0930

Research Article

IDENTIFICATION OF TOOTH SHADE IN VARIOUS AGE GROUPS OF KASHMIRI POPULATION USING VITA EASY SHADE

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A R T I C L E I N F O

Article History:

Received 15th July, 2017
Received in revised form 19th August, 2017 Accepted 25th September, 2017
Published online 28th October, 2017

Key words:

Tooth Shade, Vita Easyshade, Age

A B S T R A C T

Objective: The aim of the present study is to identify tooth shade among a group of Kashmiri patients.
Materials and methods: Total number of patients was 100. Participants age ranged from 16 to 65 years, which was divided into four groups. The tooth included in the study was vital maxillary right or left central incisors. Vita easyshade was used to select the tooth shade.
Results: Most common classical shade was B2 with highest incidence in between ages 26-35 years and shade Aspreads widely among the groups.
Conclusions: B2 was the most common classical tooth shade in kashmiri population.

INTRODUCTION

Studying color is a fundamental part of aesthetic dentistry. To fabricate an aesthetically pleasing prosthesis, information regarding the polychromatic color distribution, translucency, intricate contours, and textures of the adjacent or opposing structures must be provided for technicians.[1] color is undoubtedly one of the parameters with the greatest weight when patients judge the quality of their restoration, above all in the anterior region.[2]

The shade of the restoration is found to be the most important factor in the patient's assessment[3], where majority of patients with an anterior metal ceramic restoration were aware of the shade mismatch relative to the adjacent natural tooth[4]. Accomplishing the shade selection is normally done by visually comparing the selected tooth to shade tabs from commercially available shade guides. There are two systems used to describe color: the munsell color system and the more quantitative CIElab (commission international de l'eclairage) system[5]. The munsell system describes color in three attributes: hue, chroma and value. Used almost exclusively in color research, CIElab describes color as the product of blending three color coordinates; l*, a* and b*. By giving these three coordinates numerical values the CIElab system is able to locate an object in a three-dimensional color space. Tooth shade is measured by various methods including visual assessment with a shade guide or instrumental measurement[5]. Due to inter-human differences in the perception of color, visual shade assessment lacking standardization that may be improved by the use of a spectrophotometer[6]. The shades of several tooth colored restoratives are now keyed to the vita classical shade guide which is a very popular system in dentistry[7]. To select a shade that will ultimately result in a restoration matching the adjacent natural dentition; it is helpful to have a background about the shade distribution within the specific group of people.More recently colorimeters, spectrophotometers, and image analysis techniques have been introduced. Advocated to reduce the subjective errors in shade selection. Compared to conventional visual shade assessment, spectrophotometric analyses were determined to be more reproducible[8,9,10]. Many studies had implemented tooth color coordinates in association with age, gender and skin color[11,12,13]. Identifying tooth shade according to our population age distribution will limit the number of shade tabs that are needed for matching. A careful reduction of thenumber of shade tabs in the guide tested might simplify shade selection procedures and help to standardize shade taking[14,15].

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METHODS AND MATERIALS

The present study was conducted on 100 patients attending Government Dental College Srinagar. .Ethical board permission was granted. Patients were divided into four groups; Group 1 (16-25 years), group 2 (26-35 years), group 3 (36-45 years) and group 4 (46 years and above). The tooth included in the study was either right or left sound maxillary central incisor. Any tooth that was bleached or with enamel hypoplasia, fluorosis, veneered, carious or restored was excluded.VitaEasyshade was used to select the tooth shade. A portable clinical spectrophotometer (Vita Easyshade) was used to identify the tooth shade. The contact probe tip was

held at 90 degree to the surface in the middle one third of the tooth. The display presents the closest Vita shade in the classical and 3D shade guide designation. According to the manufacturer, two identical readings are required to ensure accuracy; the output reading was recorded. The data was analyzed by using the software SPSS (statistical package version 11.5) Tests significance level was taken at the level of P-value ≤ 0.05.

RESULTS

Out of 100 patients, 70 (70%) were male while 30 (30%) were female with a male to female ratio of 2.33:1. The age distribution of 100 patients is given in Table-1. Most of the participants fell in Group-2 accounting for 46% followed by Group-1 (23%).

Table 1 Age Distribution

Age Group	N	%
16-25	23	23
26-35	46	46
36-45	18	18
46 & above	13	13
Total	100	100

Shade A -type represented 48% followed by B-type (43%). Distribution of shade guide is given in Figure-1.

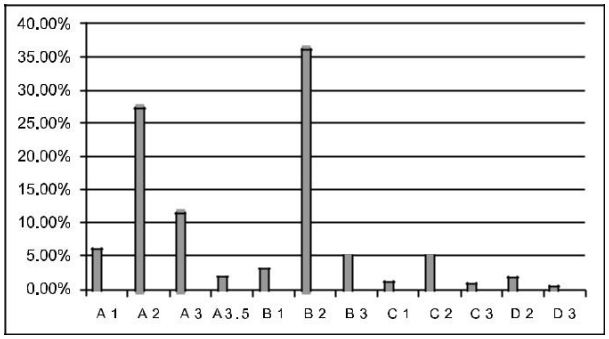

Figure 1 Tooth shade frequency in Kashmiri Population

Results showed that there was significant association between tooth shade and age with p-value at level 0.026. Shade A spreads widely among the groups. B2, B3 and B1 are the commonest shades in Group-1 and Group-2 while Group-3 and Group-4 has a sequence of A2, A1, A3 and A 3.5. The distribution of shade in relation to age group is given in Table-2.

DISCUSSION

The suggestion that population age-specific classical tooth shade guide is attainable is supported by the results of this investigation; since there was a powerful relation between tooth shade and age of patient (p-value = 0.026). These findings give rise to proposition that compensating the differences of natural tooth color space, may likely expand the options of shade selection for all populations. The significant relation between Classical tooth shade and age (p=0.026) was supported by worldwide studies[12,14,16]. Paravina[17] *et al* divided tooth shades into 4 categories according to value the highest value group (shades A1, B1, A2, B2); high value group (shades C1, D2, A3, D4); medium value group (shades B3, B4, C2, D3); and low value group (shades A3.5, C3, A4, C4). In the present investigation, all examined groups ranged between the highest and high value groups which is in agreement with the findings of Jahangiri[12]*et al*, Cocking[16]*et al* and Udea[18]*et al*. Their results also showed medium and low values tooth shade for these age groups respectively.

Table 2 Association between classical tooth shade and age

Classical Tooth Shade	Age group in years								Total	
	16 - 25		26 – 35		36 – 45		46 and above		N	%
	n	%	n	%	n	%	n	%		
A1	1	1	3	3	2	2	2	2	8	8
A2	7	7	12	12	5	5	3	3	27	27
A3	1	1	5	5	3	3	2	2	11	11
A3.5	1	1	1	1	0	0	0	0	2	2
(Shade A)	10	10	21	21	10	10	7	7	48	48
B1	0	0	2	2	0	0	1	1	3	3
B2	13	13	16	16	3	3	4	4	36	36
B3	0	0	2	2	1	1	1	1	4	4
(Shade B)	13	13	20	20	4	4	6	6	43	43
C1	1	1	1	1	0	0	0	0	2	2
C2	1	1	1	1	1	1	0	0	3	3
C3	0	0	0	0	1	1	0	0	1	1
(Shade C)	2	2	2	2	2	2	0	0	6	6
D2	0	0	1	1	1	1	0	0	2	2
D3	0	0	1	1	0	0	0	0	1	1
(Shade D)	0	0	2	2	1	1	0	0	3	3
Total	25	25	45	45	17	17	13	13	100	100
(p- value = 0.026)										

This analysis of tooth shade/age relation revealed that same age group might have the same tooth shade worldwide. The above results explanation could be due to the significant relation between age and CIELAB coordinates (L*, b* and a*) with increase of age teeth become darker, more yellow and more red. This finding was well documented in many studies[11,14,19]. Although Odioso and Reno[19], and Gibb[20] *et al* did not include a* in their studies. Xiao[13] *et al* and Hasegawa[11] *et al* found that a* values showed no significant association. Moreover Zhao and Zhu[21] did not include b* in their study.

The limitations of the present study may be derived from the sample size, selected populations as well as the measuring instrument. The sample does not represent a random sample of the Kashmiri population so extrapolation of the present study results to the general population must be done with cautious. With regard to the population, 70% of the recruited subjects were males and most of the population were in Group -2 which represents 46% of the sample size. The natural tooth

shade females and younger individuals tend to be less saturated compared to males and older populations. This could be responsible for the concentration of measured shades in B-type. Vita Easyshade 5-mm probe captures roughly 25% of the color reflection of the measured tooth, while the middle area captured was most representative of a tooth's color, this limited window yields incomplete data[22,23]. Further research is necessary to validate the present investigation findings. The participants should be balanced for age groups, ethnic background and gender. Other contributing factors to the shade of teeth, such as genetics and influence of nutrition during the development of tooth bud, should be investigated.

CONCLUSIONS

The most common classical shade was B2 with highest incidence in between ages 26-35 years and shade A spreads widely among the population

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How to cite this article:

Waseem ulAyoub and Raisa Rashid (2017) 'Identification of Tooth Shade in Various Age Groups of Kashmiri Population Using Vita Easy Shade ', *International Journal of Current Advanced Research,* 06(10), pp. 6378-6380.
DOI: http://dx.doi.org/10.24327/ijcar.2017.6380.0930

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