Correlation of Skin Colour and Gingival Pigmentation Among Middle-Aged Women in Chennai A Hospital-Based Analysis

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**ABSTRACT**

The aim of the study was to correlate gingival pigmentation skin colour among middle-aged women since middle-aged women tend to undergo drastic hormonal changes which can result in gingival hyperpigmentation. Female patients with a mean age of 40 years were categorised as fair, medium-dark on the basis of skin colour and they were correlated with the level or amount of gingival pigmentation. The level of gingival pigmentation increases along with the level of skin pigmentation from fair to dark which is proved as statistically significant with a P-value of 0.017. Gingival pigmentation is one of the major aesthetic concerns, especially in women with the limitation of the study it is found that the level of gingival pigmentation increased along with an increase in the intensity of skin pigmentation.

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**INTRODUCTION**

The colour of the gingiva is usually described as coral pink colour and gingival pigmentation is presented as diffuse discolouration or irregularly shaped brown or brown, black patches or strands (Thamaraiselvan et al., 2015; Varghese et al., 2015). Melanin is a pigmenting agent that gives colour to the tissues including gingiva and skin (Panda, 2014; Avinash et al., 2017; Mon-eim et al., 2017). Melanin is synthesised by melanocytes (Javali et al., 2011) and excessive deposition of melanin in the basal or suprabasal region of the epithelium can result in gingival hyperpigmentation (Dummett and Baren, 1971). Hormonal changes can affect the overall pigmentation (Bandish, 1985; Khalid, 2017). Everyone other than albinos have some amount of melanin pigmentation and its distribution in the epidermis. Pigmentations develop during the first two decades of life and it requires no treatment (Ramesh and Varghese, 2016; Ravi et al., 2017; Ramamurthy and Visha, 2018). Moreover, colour variation can be generalised and uniform, unilateral, bilateral and macular they also involve the gingival papillae or present throughout the gingiva and into other oral tissues.

Various factors such as physiological reasons, manifestations of systemic disease, neoplasm, endocrine changes, drugs can have an effect over gingival pigmentation (Sreeja, 2015; Khalid et al., 2016; Mootha et al., 2016). The main determinant of natural skin colour is the melanogenic activity within the melanocytes and the quantity and quality of melanin production, but not melanocyte density (Ramesh et al., 2016; Kavarthapu and Thamaraiselvan, 2018). The amount of melanin pigmentation in human epidermis and in the epithelium of oral mucosa is based on the amount of melanin. The maturation of melanosomes, the number of keratinocytes containing melanosomes and the distribution of melanin present in the keratinocytes throughout the epithe-
The gingival hyperpigmentation is not categorised as a disease it can be an esthetic problem and patients with hyperpigmentation can ask or demand gingival depigmentation (Hoexter, 1999).

Eumelanin is a pigment present in large amounts in skin hair and is photoprotective this physiologic pigmentation varies among different people and different ethnicity.

Attached gingiva is a common site of such pigmentation (Kauzman et al., 2004; Ramesh, 2019).

Various factors like age sex and hormonal influences can alter the pigmentation of the skin and oral mucosa. gingiva is the part of the oral mucosa of which covers the neck of the tooth and alveolar mucosa (Priyanka, 2017).

Middle-aged women tend to undergo drastic hormonal changes which can result in gingival hyperpigmentation. Thus the aim of this study is to correlate the skin colour and enjoyable pigmentation among middle-aged women.

MATERIALS AND METHODS

The study is a retrospective study the study was conducted after obtaining permission from the institutional review board of the university (Saveetha University Chennai India).

A total of 130 female patients aged between 30 to 60 years were screened and after analysing with the inclusion and exclusion criteria, 99 patients were included in the study.

The inclusion criteria it includes all patients with proper photograph extraoral and intraoral images and systemically healthy patients are also patient with a past medical history of diabetes and hypertension were included in the study.

The exclusion criteria it includes all the patients with a past medical history of the syndrome is like Peutz jeghers syndrome Melasma, and other pigmented skin lesions pregnant patients and lactating women were not included in the study.

The profile picture of the patient and intraoral photograph of the patient (frontal) were evaluated to assess the amount of gingival pigmentation.

The criteria that were used to assess the gingival pigmentation was gingival pigmentation, index-Bradley Cooper.

0 pink
One mild light brown pigmentation
2 medium brown pigmentation
3 dark brown/black pigmentation

Skin colour was categorised as for medium or wheatish and dark based on the study relating skin colour and tooth study by Vivek Sharma.

Statistical analysis

All the data were analysed and results were drawn in percentage. Pearson correlation coefficient was used to analyse and correlate the level of skin colour and gingival pigmentation.

RESULTS AND DISCUSSION

In the present study a total of hundred female patients aged between 30 to 60 years were analysed (mean age of 42.1 years) the data was obtained from the digital cash sheet it was found that 76 percentage of the patients Belong to medium skin tone 16 percentage where dark skin tone and only eight percentage fair skin tone 76 from the overall patients included in the study (Figure 1).

![Figure 1: The pie chart represents the percentage of skin colour in patients](image)

Level of pigmentation and Fair skin-toned patients

It is even that of the fair skin toned patients, 44 % of them had gingiva pink in colour and 56 % had gingiva with mild light brown pigmentation (Figure 2).

Level of general pigmentation in moderate skin tone the patient

In patients with moderate skin tone, it was observed that 17 % had gingiva pink in colour and 45 % had gingiva with mild light brown pigmentation and 31 % had gingiva with medium brown pigmentation and only 7 % had dark brown or black pigmentation (Figure 3).

Level of gingival pigmentation in dark skin tone patients

It is seen that 7 % of the patients had pink coloured gingiva and 31 % of the patients had gingiva with
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Figure 2: The pie chart represents the percentage of gingival pigmentation in fair skin toned patients

Figure 3: The pie chart represents the percentage of gingival pigmentation in medium skin toned patients

Figure 4: The pie chart represents the percentage of gingival pigmentation in dark skin toned patients

mild light brown pigmentation and other 31% had medium brown skin pigmentation and the rest 31% of the patients had dark brown or black pigmentation (Figure 4).

The correlation coefficient value for the skin and gingival pigmentation was 0.378, which is a low positive correlation; where the level of gingival pigmentation increases along with the level of skin pigmentation from fair to dark.

Health and appearance of gingiva are important in terms of esthetic concern. The colour of the gingiva differs among individuals and is assumed to be associated with cutaneous pigmentation. Skin colour varies from light to dark brown or black. The skin tone and texture of the skin and colour are different in various races and geographic locations the colour of gingiva is based mainly upon the number and size of vasculature/blood supply thickness of the epithelium, keratinization degrees and pigments within the gingival epithelium. Melanin, carotene, reduced haemoglobin and oxyhaemoglobin are the major pigments contributing to the normal colour of the oral mucosa.

The present study showed that the level of gingival pigmentation increases when the skin pigmentation is intense. The correlation value shows that there is a low positive correlation where at some instances there could be some changes in the level of gingival pigmentation with the skin colour.

The results of the study is partially in agreement with the results of the study done by Rakeshwar et al. where they found that there is a positive correlation between the severity of gingival pigmentation and skin colour (Patil et al., 2016). In a study by Raut (1954), they found that the skin colour of ginger and facial complexion showed a positive correlation dark subjects observed heavy gingival pigmentation and their subjects with mild pigmentation on a study in Indian population.

The results of Ponniyan et al. also had a positive correlation with the skin colour and gingival pigmentation (Ponniyan et al., 2013; Ramesh et al., 2017). Thus, skin colour can determine gingival pigmentation. The low positive correlation of the study shows that the level of gingival pigmentation can vary from individual to individual based on factors like age hormonal factors etc.

CONCLUSION

Gingival pigmentation is one of the major aesthetic concerns, especially in women. Within the limitation of the study, it is found that the level of gingival pigmentation increased along with an increase
in the intensity of skin pigmentation.

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**Conflict of Interest**
The authors declare that there is no conflict of interest for this study.

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