Amount of Gingival Display in Smiles of Sample Population from Nepalese Population with High Upper Lip Position

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ABSTRACT

Introduction: Today's aesthetic dentistry focusses on improvement or modification on gingival exposure for a beautiful smile. Increased gingival display is often considered as unaesthetic. There seems paucity of literature measuring the amount of pink portion of smile in Nepal. It is important to identify the acceptable gingival display for better planning the treatment in the patients with high lip position.

Objective: To quantify the gingival exposure in a sampled Nepalese population with high upper lip position and to analyse based on gender.

Materials and Method: The standardised digital photographs of participants with high upper lip position were collected and transferred to personal computer in which the gingival display during social smile was measured and analysed.

Result: The mean height of gingival exposure was 4.23±1.906 mm with female having 4.45±2.1 mm and male having 3.82±1.453 mm. The difference was not statistically significant ($p>0.05$) based on gender. In 36 participants, the exposure of more than 3 mm was reported.

Conclusion: Within limitations of the study, we found the mean height of gingival exposure to be 4.23±1.906 mm in studied sample. The prevalence of higher gingival component was noted and appropriate treatment modality is recommended to beautify the smiles.

Keywords: Aesthetics; gingiva; tooth components.

INTRODUCTION

Smile is considered as a first-rate human interaction due to colour contrast present in teeth, gingivae and lips.[1] Facial attractiveness is largely attributed for enhanced personality of an individual.[2] Various parameters contribute to an aesthetic smile. One such component is upper lip position. Historically, Tjan et al.[2] classified gingival exposure of smile based on smile line into three classes; high, medium or low (Figure 1). Increased exposure of gingiva contributes to unaesthetic smile. But it is important to note that gingival exposure need not be completely eliminated for an aesthetic smile.[1] Expected amount of gingival exposure was thought to be 3.0 mm or less.[3,4] A high smile line reveals the entire crown of the tooth and an abundant amount of gingiva (excessive gingival display).

Smile analysis is a cincture of facial aesthetics, orofacial aesthetics, oral aesthetics, dentogingival aesthetics and dental aesthetics[1,2] which helps create a beautiful smile by prosthodontic, periodontal, conservative or orthodontic treatment. Dentogingival analysis is done to get the balance between amount of gingival exposure and tooth dimensions.[5]

This study aimed to find mean gingival exposure dimension in social or posed smile in a sample from

Figure 1: Classification based on upper lip position, A – high, B – medium and C – low.

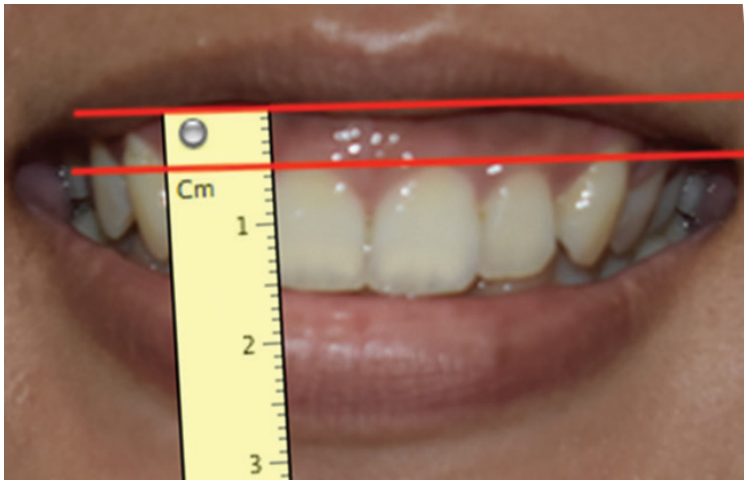

Figure 2: Measurement of gingival exposure carried out with the help of digital caliper (free ruler software).

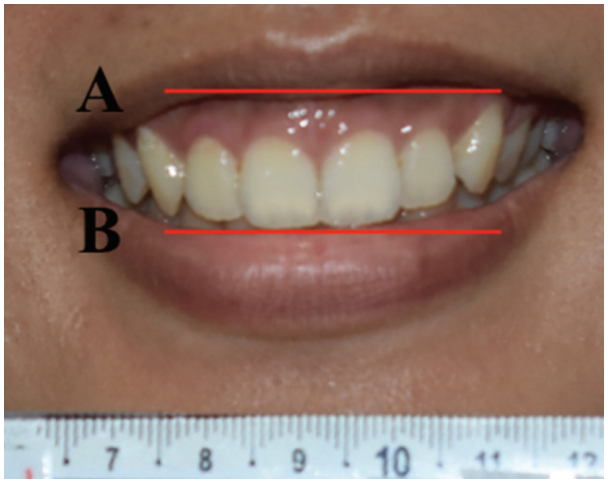

Figure 3: Interlabial gap measured from line A to B.

Nepalese population with high upper lip position and to analyse gender variation of the exposure.

MATERIALS AND METHOD

This is a photographic study carried out from 2017 June to 2018 June in the participants from Eastern Nepal who have high smile line. The ethical approval of the study was obtained from institutional review committee of BP Koirala Institute of Health Sciences (385/073/074-IRC). Pictures were captured with the help of D3400 camera with Nikkor lens 18-55 mm (Nikon Corp. Japan) when participant was asked to give social smile keeping the lens at 90 degrees to participant's face (Figure 2). Participant carried a scale beneath lower lip which helped to neautralize magnification factor during measurements as done in a study.[6] The measurement was carried out in 43 photographs who had high upper lip position. Measurement of gingival exposure was done at midline from the zenith point of central incisors and canines to the lower border of upper lip (Figure 2). Average of such multiple measurements were recorded. Interlabial gap was measured vertically from lower border of upper lip to upper boarder of lower lip (Figure 3).

RESULT

In the study, 28 were female and 15 were male. Mean age of the participants was 24.37±6.983 years. The mean interlabial gap was 12.22±4.235 mm and mean gingival exposure was 4.23±1.906 mm.

Classifying the sample based on height of gingival exposure, 16 participants had 3 to 4 mm of exposure, 7 participants had 4-5 mm of exposure and 13 participants had more than 6 mm (Table 1). We also determined the percentage contribution by gingiva for interlabial gap. Mean percentage contribution was 30.9% with maximum up to 71.94%.

Table 1: Distribution of studied sample based on different height of gingival exposure.

Height of gingival exposure (in mm)	Count
1 – 2	6
2 – 3	1
3 – 4	16
4 – 5	7
>6	13
Total	43

Table 2: Comparison of gingival exposure in terms of gender.

Gender	Mean height	Standard deviation	p-value*
Male	3.82 mm	1.453	0.256
Female	4.45 mm	2.1	

**independent sample t test, p>0.05 statistically not significant*

The difference in mean vertical height of gingival exposure in male and female was not statistically significant ($p<0.05$) when tested by independent sample t test (Table 2).

DISCUSSION

This study determined the mean vertical height of exposed gingiva in a sample from Nepalese people with high upper lip line during posed smile. There seems scarcity of studies pertaining to quantification of dentogingival parameters in our context. It is important to note that mere beauty of teeth cannot give a cumulative visual impact and micro as well as macro-aesthetic elements need to be addressed for designing a better smile.[7]

Females have higher gingival exposure in comparison to males in our study which is in agreement to other studies.[2,5] Although we studied the gingival display of anterior dentition and mean of the measurements was considered, first premolars were reported to have higher gingival display.[8] Interlabial gap with more dental exposure and minimal gingival exposure accounts for a beautiful smile. But some participants in our study had higher contribution of gingival portion to interlabial gap. In comparing Japanese models and patients, Murakami et al. reported significantly higher gingival exposure in patients than in models.[9]

Position of free gingival margin can be affected by a number of factors such as alveolar crest position, gingival biotype, passive eruption, restorations, and malpositions of teeth.[10] Thus, it is important to consider these things while planning treatment.

There are reports suggesting gingival modification treatment for the gummy smile.[11,12] It is also important to regard the upper lip asymmetry[13] while correcting gingival position because sometimes asymmetrical position of upper lip can pose as a contributing factor for unaesthetic smile. Similarly, gingival exposure can be graded as I degree (2-4 mm), II (4-8 mm) and III (>8mm) in vertical maxillary cases and accordingly treatment options can vary from orthodontic intrusion to orthognathic surgeries.[14,15]

The limitations of this study are: This study excluded the measurements of gingival exposure in posterior dentition which also plays an important role in smile aesthetics. The sample size was small in this study. Also, smile was voluntarily posed type which can have subjective control during photography. Videographic studies are supposed to be better alternative in smile analysis.

CONCLUSION

In subject to aforementioned limitations, the mean gingival exposure height in high smiling individuals was determined which was 4.23±1.906 mm. Many participants had high gingival display and the scrutiny by dental professionals is recommended in them.

ACKNOWLEDGEMENT

Dr. Anuha Gautam, Mr. Bharat KC, Mr. Deepesh Shrestha, Ms. Smriti Rai, and MS Puja Basnet for assisting in photography.

Disclosure - The photographs used in this article were taken during study with proper consent.

Conflict of Interest: None.

JNDA

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