Smile analysis in Haryanavi Females

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ABSTRACT

Background: *The smile is one of the most important facial expressions and is essential in expressing friendliness, agreement and appreciation. The evaluation of the intrinsic characteristics of the smile is a necessary procedure to achieve consistent form in orthodontic treatments, which in turn makes it necessary to recognize the components and factors that affect these characteristics.*

Objectives: *The study was conducted to evaluate various characterstics of smile in Haryanavi females which may serve as a guideline for enhancement of esthetic and cosmetic surgery.*

Material and methods: *The present study was conducted on 50 females age group 18-25 years in Pt. B.D. Sharma Post graduate institute of Medical Sciences, Rohtak. The photographs were clicked with the digital camera with high resolution. The following parameters of smile were noted in all the subjects: Position of upper lip while smiling, alignment of upper incisal edge to lower lip, Tooth-lower lip position.*

Results: *The high position of upper lip while smiling was noted in 56% cases, alignment of upper incisal edge to lower lip was convex in 54% cases, Tooth-lower lip position was not touching in 54% cases.*

Conclusions: *The present study will provide baseline data of an esthetic smile in Haryanavi females. The baseline data may serve as a guideline for restoration or enhancement of esthetics for the anterior component of the dentition.*

Key Words: *Smile, Orthodontics, Esthetics*

Introduction

Aristotle said "Beauty is a greater recommendation than any letter of introduction". A statement that is true nowadays where attractive people have a much better chance of being successful. The smile constitutes an important component in the presentation of a human being favouring his or her social acceptance. A non harmonic smile decreases the beauty of the face and it can cause discomfort in the social conviviality, as it is one of the important facial expression that demonstrates friendship, sensation and appreciation. Dentists and orthodontists can greatly contribute to enhancing patient's smile, appearance, and subsequently their self-confidence. Ideal occlusion should certainly remain the primary functional goal of orthodontics but the esthetic outcome is critical for patient satisfaction. In addition to a well-balanced functional occlusion, a well-balanced smile is an important treatment objective. [1] This objective adds a significant dimension of successful orthodontic treatment, which is deeply appreciated by the patient and parent.

Smile has been defined as a pleasant positioning activity of muscles of facial expression which radiates pleasant sensory stimuli thus creating a feeling of wellbeing

to the wearer and the spectator. A pleasing smile involves a harmonious relationship between the teeth, gingival scaffold, and the lip framework. The importance of physical and facial attractiveness, in which the smile arguably plays a large role, has been studied and related to job recruitment decisions, initial impressions, susceptibility to peer pressure, voting and juror decisions, and social interactions including dating decisions. [2] An attractive smile is a requisite for winning elections, and a beautiful smile sells products for companies whose subliminal message in an advertisement is 'look better – feel younger. [3] The esthetic analysis of smile by the visual perception should consider it as a unique composition, in which some elements act in combination to make the smile harmonious and pleasant for the observer. Significant disruptions in the composition deviates the attention to the undesired element; alterations in the gingival component, lip shape, and filling of the gingival papillae call the attention due to their distinguished role in the composition of smile. [4] Smile analysis is an important stage for the diagnosis, planning, treatment and prognosis of any dental treatment involving esthetic objectives.

Material and Methods

The study was conducted on 50 females, age group 18-25 years in Pt. B.D. Sharma Post graduate institute of Medical Sciences, Rohtak. The methods and objectives were explained to them and written consent was obtained for willful participation in the study. Following inclusion and exclusion criteria were used for selection of the subjects.

Inclusion criteria
The subjects having full dentition were included. However, the eruption of last molar was ignored in the subject as its eruption is variable and is not a dependable criterion.

Exclusion criteria
a) Subjects with deformity, injury, trauma, malformation, surgical scar and congenital abnormalities of the lips were excluded.
b) Subjects who have migrated into Haryana from other places were excluded.
The photographs were clicked with the digital camera with high resolution. The following parameters of smile were studied.

1) **Position of upper lip while smiling**: Depending on the extent of exposure of maxillary anterior teeth, interdental papilla, gingival and mucosa during smile, the smiles were categorized as one of the following three types [5, 6] (Fig. 1)

   i) **High smile (Mucosa smile)**: Full exposure of labial surface of teeth, interdental papilla, free marginal gingiva and labial mucosa during smile. (Fig. 1a)

   ii) **Average smile (Papilla smile/ gingival smile):** An about 75% to 100% exposure of the maxillary anterior teeth and the interproximal gingiva. (Fig. 1b)

   iii) **Low smile (Tooth smile)**: Exposure of less than 75% of the anterior teeth. Failure to expose the upper anterior teeth gives a negative smile. (Fig. 1c)

a) High smile line

b) Average smile line

c) Low smile

Fig. 1 Position of upper lip while smiling

2) Alignment of upper incisional edge to lower lip: There should be harmony between the curvatures of the incisal edge of anterior maxillary teeth with the curvature of the upper edge of the lower lip during voluntary smiling. [7] This relationship between the incisal edges of canines and maxillary incisors with the lower lip is called the smile arch. [8, 9]

Generally three types of smile lines are observed, the convex, straight and concave. All these smile lines were categorized depending on the alignment of upper incisional edge to lower lip. [8, 9]

i) Convex smile line: when the incisal margin of the maxillary central incisors appears below the canine cusps.

ii) Straight smile line: when the incisal curve is not there, all the maxillary incisors and canine are in a straight line.

iii) Concave smile line: when the canine cusps appear more occlusal than maxillary central incisor tip margin.

For an attractive smile, contact should preferably be present between the incisal edges of upper teeth and vermillion border of lower lip. Absence of parallelism between smile line and lower lip together with no contact of incisal edges with lower lip gives negative effect to the smile. Convex smile line accentuates the quality of smile and therefore it is a positive smile line. The concave smile line gives an unpleasant, harsh, distracted character to smile and it is therefore a negative smile line. Straight smile line can have a positive or negative effect depending on its, harmony to the lip curvature and to the presence or absence of buccal corridor. A convex smile line and parallelism of smile line to lower lip are two desirable qualities of smile which gives pleasantness to smile.

3) Position of incisal curve relative to touching the lower lip: The position of contact between the lower lip and incisal

edge was noted. Maxillary teeth may remain apart (non-contact position, occasionally touch the lower lip (contact position), or else be covered by the lip (covered position). [6]

Results

Table 1

Parameters	Positions	Percentage
Position of upper lip while smiling	High	56%
	Average	40%
	Low	4%
Incisional edge to lower lip	Convex curve	54%
	Straight	40%
	Concave curve	6%
Tooth-lower lip position	Not Touching	54%
	Touching	40%
	Slightly covered	6%

The result of this experiment showed the following characteristics of smile in Haryanavis:

1. High incidence of full exposure of labial surface of teeth, interdental papilla, free marginal gingiva and labial mucosa during smile.

2. The incisal curvature of the maxillary anterior teeth parallels the inner curvature of the lower lip.

3. The incisal curvature may be either totally not touching or slightly touching the lower lip.

Discussion

Table 2: Showing position of upper lip while smiling

Position of upper lip while smiling				
Authors	Region	Position		
		Average	High	Low
Tjan et al[6] (1984)	California(USA)(F)	73.71%	13.79%	12.50%
Zachrisson[10] (1998)	Los Angeles(USA)	69%	11%	20%
Yoon et al[11] (1999)	Korea	45%	12%	43%
Patnaik&Goel[12](2010)	North India(F)	44.5%	20.64%	34.83%
Kaur et al[13] (2011)	North India(F)	65.5%	22.5%	12%
Present Study	Haryana	40%	56%	4%

The present study revealed that the high position (56%) was the most common followed by average (40%) and low (4%) position. Tjan et al (73.71%), Zachrisson (69%), Yoon et al (45%) found the average position to be most common. Tjan et al and Zachrisson conducted study on American population whereas Yoon et al studied Korean population. The difference of our study with above authors could be explained on racial basis. Patnaik and Goel (44.5%) and Kaur et al (65.5%) also found the average position to be most common in Punjabi population. The difference of result with study conducted by Patnaik & Goel and Kaur et al could be explained on regional basis as both studied Punjabi population. The smile line can be regarded as a determining factor in the evaluation of mouth esthetics. It is not uncommon for the conclusion of orthodontic treatments to be compromised by the smile line. Either high or low smiles can compromise the results. This is perhaps the great challenge of contemporary orthodontics in its search for excellence. Medical and dental interventions that are able to correct a negative labial influence are always welcome. This integrated approach by professional teams will bring new possibilities of better results, expanding treatment options, and perhaps creating a higher demand for the solution of problems involving mouth, facial and dental aesthetics.

Table 3: Showing Alignment of upper incisional edge to lower lip

Alignment of upper incisional edge to lower lip				
Authors	Region	Position		
		Convex curve	Straight	Concave curve
Tjan et al[6](1984)	California(USA)(F)	85.77%	13.56%	0.6%
Zachrisson[10](1998)	LosAngeles(USA)	85%	14%	1%
Yoon et al[11](1999)	Korea	60%	34%	5%
Patnaik&Goel[12](2010)	North India(F)	56.12%	41.93%	1.93%
Kaur et al[13] (2011)	North India(F)	59.5%	29%	11.5%
Present Study	Haryana	54%	40%	6%

The present study showed that the alignment of upper incisional edge to lower lip was convex (54%), followed by straight (40%) and concave (65%).The study was comparable to Tjan et al and Zachrisson study conducted in American population, Yoon et al study on Korean Population and Patnaik and Kaur et al study on Punjabi population. The ideal is for the curvature of incisal edges to be parallel to the lower lip. However, this is only possible when the lower lip creates a natural curvature, with the corners of the mouth turned upwards, and incisal edges follow that curvature. In other words, in order to achieve a pleasing

effect, it is necessary that dental and labial structures be symmetrical.

Table 4: Showing Tooth lower lip position while smiling

Tooth lower lip position while smiling				
		Position		
Authors	Region	Touching	Not Touching	Slightlycovered
Tjan et al[6] (1984)	California(USA)	57.89%	27.63%	14.47%
Patnaik&Goel[12](2010)	North India(F)	31.61%	50.96%	17.41%
Kaur et al[13](2011)	North India(F)	30.3%	50.3%	19.4%
Present Study	Haryana	40%	54%	6%

The present study revealed that the most common tooth lower lip position while smiling was not touching (54%) followed by touching (40%) and slightly covered (6%). These results were comparable to studies conducted in North Indian population by Patnaik & Goel and Kaur et al. The difference of our study with study conducted in USA by Tjan et al could be explained on genetic basis. This situation can vary among individuals or even in the same person depending on mouth opening. The muscle contractions of the lower lip also alter this relationship. The ideal is for the curvature of incisal edges to be parallel to the lower lip and the incisal edges slightly apart or softly touching the lip.

Esthetic considerations are paramount in treatment planning; however, rigid rules cannot be applied to this process because almost an infinite variety of faces could be esthetic.[14] As norms for beauty do not exist, the orthodontist must have an eye for beauty, hand skills for art, and knowledge of an individual's anatomical smile window. Accordingly, it is important to have general guidelines that aid the clinician to optimize dentofacial esthetics, while satisfying other treatment goals. Since time has been introduced as the fourth dimension of treatment planning long-term knowledge of dentofacial changes are paramount to clinical success. [15] Developing a "standard of normalcy" for smiles is important as it would give guidelines for orthodontist to have better treatment results. Consideration of the criteria of a smile obtained from this study in Haryanavis may serve as a guideline for enhancement of esthetic and cosmetic surgery.

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