



Association between Gummy Smile and Heredity- A Cross Sectional Study

Dr. Lata Ajay Tapnikar¹, Dr. Uday Patel²

¹Associate Professor, Department of Community Medicine, **School of Medical Sciences, Sehore, Madhya Pradesh, India**

²**Reader**, Department of Conservative Dentistry and Endodontics, Vaidik Dental College and Research Centre, Nani Daman, Kadaiya, Daman and Diu, India

Corresponding author:

Dr. Lata Ajay Tapnikar

(Received: 27 October 2023

Revised: 22 November

Accepted: 26 December)

KEYWORDS

Family History,
Gingiva,
Inheritance, Maxillary Incisor

ABSTRACT:

Background and Aim: Excessive gingival display is a condition in which the maxillary gingiva is overexposed when smiling. Gummy grin, high lip line, short upper lip, and complete denture smile are all terms used to describe the gingival smile. There may be a link between genetics and gummy grin, although few researches have been conducted to date to investigate this possibility. As a result, the goal of this study is to assess the association between gummy grin and genetics.

Material and Methods: The current study included 100 participants who had a gummy smile. The patients that were chosen and enrolled ranged in age from 10 to 20 years. The gingival boundary of the upper incisor to the upper lip stomion was measured in millimeters with a caliper to determine the gummy grin. A comprehensive history of gummy grin in the family for the last two generations was documented. Following that, the patients were separated into two groups: Patients with gummy smiles with a familial background were in Group A, whereas patients with gummy smiles without a familial background were in Group B.

Results: According to the findings of the study, 40% of patients had gummy grin with a family aetiology and 60% of patients had gummy smile without a familial etiology, indicating that inheritance is not a significant etiological component for gummy smile.

Conclusion: Gummy Smile is an unappealing cosmetic disorder that has a psychological impact on the sufferer and might reduce their self-confidence. Correction of this problem is critical for a person's overall attractive look. The correct etiology for gummy grin should be determined and handled properly from the various therapy choices that are most suited to the patient.

INTRODUCTION

The major reasons for people to visit an orthodontist are the state of their smile. The measures often employed to assess orthodontic conditions disregarded aesthetic goals and deemed them difficult to adjust and personalize. Among the major aims of the treatment strategy, optimal occlusion has been prioritized, and thinking that adequately occluding the first molar and canine produced a smile enhancement. Although this is true for many labio-dental features (over jet reduction,

crowding resolution, or space narrowing), some of them, such as gum exposition, may be exacerbated.^{1,2}

Excessive gingival display is a condition in which the maxillary gingiva is overexposed when smiling. Gummy grin, high lip line, short upper lip, and complete denture smile are all terms used to describe the gingival smile. The exposure of excessive gingival tissue in the maxilla is classified as a gummy grin. Patients with extensive gingival show are unhappy



with their clinical look. It affects around 10.5% of the population, with a female preponderance (2:1). During an inappropriate grin, a normal gingival display between the inferior border of the upper lip and the gingival edge of the anterior central incisors is 1-3 mm. A gingivae-to-lip distance of 4 mm or greater is considered ugly.^{3,4}

The exposed periodontal and gingival structures can be characterized based on the height of the exposed gingival tissue: A high grin has more than 4 mm of exposure; a medium smile has 3 to 4 mm of exposure; and a low smile has less than 3 mm of exposure. This exposure can be attributed to vertical maxillary excess, increased interlabial space during rest, problems with alveolar bone formation, tooth eruption without exposing the total curvature of the crown at the cervical region, hereditary causes, dense or malpositioned lip frenulum, marked facial muscle tonus, gingival hyperplasia, and inflammation.^{5,6}

There may be a link between genetics and gummy grin, although few researches have been conducted to date to investigate this possibility. As a result, the goal of this study is to assess the association between gummy grin and genetics.

MATERIALAND METHODS

The current study included 100 participants who had a gummy smile. The patients that were chosen and enrolled ranged in age from 10 to 20 years. The existence of a gummy smile with more than 2 mm exposure was used as a selection criterion. The College of Dentistry Ethics Committee authorized the study, and all patients provided written informed permission.

Although the World Health Organization defines adolescents as those aged 12 to 18, the inclusion criteria were those aged 10 to 20 who were attending high school in public and private schools, an age group with greater emotional maturity to analyze their own smile; having no harmful habits; having facial Pattern I; and not undergoing orthodontic treatment. Adolescents under the age of 18 and those who were unable to understand, such as those with cognitive impairment syndromes or hearing and/or vision impairment, were excluded from the research. Subjects having a history of congenital abnormalities, lip injuries, or face surgery were barred from participating.

The participants chosen did not have any surgical or orthodontic therapy. They possessed natural upper and lower anterior teeth that were free of cavities, excessive occlusal wear, restorations, extrusion, apparent abnormalities, or tooth movement.

The gingival boundary of the upper incisor to the upper lip stomion was measured in millimeters with a caliper to determine the gummy grin. The digital camera was used to obtain frontal images of patients with gummy smiles of greater than 2mm. Likewise, both parents were photographed.

A comprehensive history of gummy grin in the family for the last two generations was documented. Following that, the patients were separated into two groups: Patients with gummy smiles with a familial background were in Group A, whereas patients with gummy smiles without a familial background were in Group B.

RESULTS

The purpose of the study was to determine the association between gummy smiles and inheritance patterns. The information was coded and put into Microsoft Excel before being analysed with SPSS statistical software. The qualitative data was proportionally measured and validated with a 95% confidence level.

According to the findings of the study, 40% of patients had gummy grin with a family etiology and 60% of patients had gummy smile without a familial etiology, indicating that inheritance is not a significant etiological component for gummy smile.

Table 1: inheritance pattern of gummy smile in different groups

Group	Frequency	Percentage
Group A	40	40
Group B	60	60
Total	100	100

Discussion

Muscle and lip motions are involved in the grin, as well as the exposure of teeth, gingiva, and periodontal structure. Based on this data, the dentist may rectify the system's flaws, resulting in a more harmonious grin. The periodontal and gingival structures revealed during the smile are characterized based on the height of the exposed gingival tissue: high smile - more than 4 mm of exposure; medium smile - between 3 and 4 mm of exposure; low smile - less than 3 mm of exposure.^{7,8}

A variety of techniques can be used to treat excessive gingival display. Nonsurgical and surgical approaches are included in these treatments. The underlying reason of excessive gingival show, often known as a Gummy Smile, has a significant impact on the sort of surgery that will be performed. Botulinum toxin type A



injection and orthodontics are examples of non-surgical treatments, but surgical procedures may include lip repositioning or orthognathic surgery after orthodontics.

Gingivoplasty seeks to treat gingival overgrowth aesthetically while restoring biological and physiological space. Gummy smiles are caused by medium to high gingival exposure and can be repaired by gingivoplasty. To conduct gingivoplasty successfully, the dentist should consider the following factors: the procedures, the individual's gender, age, and race. Females exhibit the exposure of the tooth-gingival limit during the grin more frequently than males. Because young people have more and stronger muscular tonus, they tend to reveal more tooth structures when they smile than the elderly. Black individuals have less maxillary gingiva during a grin than white people because of their lip shape and volume.⁹

Marcelo Tomas Oliveira et al.¹⁰ discovered that the causes of gummy grin were multifactorial and included excessive vertical maxillary growth, excessive labial contraction, shorter upper lip, gingival excess, and anterior tooth extrusion. Sheldon Peck discovered that gummy smiles are caused by vertical maxillary excess and a lack of muscular capacity to elevate the upper lip. According to the findings of the study, 40% of patients had gummy grin with a family aetiology and 60% of patients had gummy smile without a familial aetiology, indicating that inheritance is not a significant etiological component for gummy smile. It must be cross-checked and validated with more research.

CONCLUSION

Gummy Smile is an unappealing cosmetic disorder that has a psychological impact on the sufferer and might reduce their self-confidence. Correction of this problem is critical for a person's overall attractive look. The correct aetiology for gummy grin should be determined and handled properly from the various therapy choices that are most suited to the patient.

Conflict of interest: None declared.

Sources of funding: Nil.

REFERENCES

1. Felemban, O. M.; Alharabi, N. T.; Alamoudi, R. A.; Alturki, G. A.; Helal, N. M. J. J. o. O. S. Factors influencing the desire for orthodontic treatment among patients and parents in Saudi Arabia: A cross-sectional study. 2022, *11*.
2. Shaw, W. J. T. E. J. o. O. Factors influencing the desire for orthodontic treatment. 1981, *3*, 151-162.
3. Brizuela, M.; Ines, D. Excessive gingival display. 2017.
4. Ser Yun, J.; Luo, M.; Yin, Y.; Zhi Hui, V.; Fang, B.; Han, X. J. W. J. S. S. R. Etiology-based treatment strategy for excessive gingival display: literature review. 2019, *1103*.
5. Santos, F. R.; Zamboni, F. T.; Yamaguchi, P. S.; Storrer, C. L. M.; Osternack, F. H. R.; de Oliveira, N. D.; Deliberador, T. M. J. R. R. S.-B. d. O. Correction of gummy smile prior to restorative procedures: case report. 2016, *13*, 124-130.
6. Patel, S.; Metgud, R. J. J. o. c. r.; therapeutics. Estimation of salivary lactate dehydrogenase in oral leukoplakia and oral squamous cell carcinoma: a biochemical study. 2015, *11*, 119-123.
7. Frizzera, F.; Shibli, J. A.: *Integrated Esthetics in Periodontics and Implantology*; Quintessenz Verlag, 2022.
8. Schwartz-Arad, D.: *Esthetics in Dentistry*; Quintessenz Verlag, 2019.
9. Mostafa, D. J. I. j. o. s. c. r. A successful management of sever gummy smile using gingivectomy and botulinum toxin injection: A case report. 2018, *42*, 169-174.
10. Brito, M. L. d.; Silva Junior, M. L. S.; Carvalho, B. W. L.; Silva, E. M. C. d.; Lira, A. D. L. S. d. J. B. J. o. O. S. Prevalence and factors associated with gummy smile in adolescents: a cross-sectional analysis. 2023, *22*, e230408.