Relationship between Lip Print and Dental Caries- Survey Article

Govindarajan Sumathy[1], Bhaskaran Sathyapriya[2], Aarthi.S[3], Kouser Taj.A [3],Simrita Sri K Jagthap[3], Chandrakala B[*]

1. Professor and Head, Department of Anatomy, Sree Balaji Dental College & Hospital, Bharath Institute of Higher Education & Research, Chennai.

2. Professor, Department of Anatomy, Sree Balaji Dental College & Hospital, Bharath Institute of Higher Education & Research, Chennai.

3. Graduate student, Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research

Department of Anatomy, Sree Balaji Dental College & Hospital, Bharath Institute of Higher Education & Research, Chennai.

Abstract-

Background - Dental caries is a major public health concern affecting millions of people worldwide.Its aetiology is complex, however the question of a possible true genetic predisposition toward dental caries has piqued the minds of dental investigators for decades as lip and thumb and the tooth enamel are derivatives of embryonic ectoderm.

Aim and Objective – The objective of this article is to know the relationship between lip print and dental caries and to know which type of lip print is more susceptible to dental caries. Sample lip prints collected from the subjects are segregated according to their types and presence of dental caries in order to study their relationship.

Methodology-A Descriptive, cross-sectional study was among 87 adults aged 18-55 years by cheiloscopy and examination of dental caries.The lips prints were recorded on paper and analyzed using Tsuchihashi's classification. Dental caries are registered according to FDI system.

Result - Among the study, the branched pattern (type II) of lip prints was seen in 72% with a higher incidence of caries in our study and this was also in accordance to the study done by Madhusudan et al.

Conclusion - The current study has helped us to correlate certain patterns which might be related to specific occurrence of dental caries and their relationship. In our study, among cheiloscopic patterns, type II (branched) pattern was predominant among all the subjects.

Key words: Cheiloscopy, dental caries, Suzuki and Tsuchihashi's classification, genetics, embryonic development.

Introduction:

The grooves and wrinkles present in the zone of transition of the lip, between the inner labial mucosa and outer skin produces a characteristic and unique pattern called lip prints, the study of which is known as cheiloscopy. [1] Lip prints are uniform throughout life and recover after undergoing alterations following trauma, inflammation, and other environmental conditions. [1] Hence, they have the same forensic value as dactyloscopictraces.[1]Dental caries is a major public health concern affecting millions of people worldwide. [1]It is a ,"carbohydrate modified transmissible local infection with saliva as a critical regulator".[1]The Keyes Triad more or less Lips and Fingertips tell it all - explains the multifactorial nature of aetiology of caries, but still, there are some individuals who appear to be more susceptible to caries and some who are extremely resistant, regardless of the environmental risk.[1]

This forms the basis of our study, which tries to bridge the gap between technology and us, by considering cheiloscopic as genetic markers for dental caries and studying their role in predicting an individual's susceptibility to dental caries. [1] Hence the aim of this study was to study the role of cheiloscopy as predictive factors for dental caries in an institutional population. [1]

Methods:
Lip print and the dental caries are studied among 87 adults in the age group18-55 years by cheiloscopy and examination of dental caries.
Materials:
Materials used are Lip stick, Cellophane tape, A4 sheet, Magnifying glass, Cotton, Coconut oil, Distilled water,Mouth mirror.

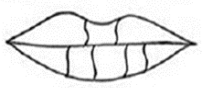
Procedures:
Procedure of Lip print recording
The lips of the subjects were cleaned and a lipstick was applied evenly over the vermillion border of the lip and subjects were asked to rub both the lips to spread the applied lipstick uniformly.[3] A4 sheet was folded into half and kept ready to record the lip print. After a minute, crease line(folded portion) of the A4 sheet was placed between the lips of the subject. The subject is now asked to pressed and dab (once) the lips against the A4 in order to record the lip prints.
The subject is asked to unloosen gently and release the sheet from tracing back from the vermillion border of upper and lower lip till the procheilon ending on the tubercles of the lip.The A4 sheet is removed carefully from the mouth of the subject without damaging the lip print which is recorded.
A4 sheet containing the lip print of the subjects are carefully secured with cellophane tape. The lip color on the lips is removed firstly by gently wiping with cotton which is partially immersed in the organic coconut oil then completely cleaned with distilled water. The lip prints were then analyzed bySuzuki and Tsuchihashi's classification using a magnifying glass.[3]

Procedure for identifying dental caries
The colour and shape of teeth on all aspects of every tooth of the subject is inspected and thoroughly examined.The presence of white chalky spot on the surface of the tooth is because of demineralization of enamel. These spots on further erosion turn brown to black which is a definite sign of infection.
Dental caries of the subjects are studied using mouth mirror and if cariesare present, then according to FDI system the tooth /teeth having caries are registered.
Inclusion criteria-volunteering healthy individuals were included in the study. [3] Exclusion criteria-subjects having any developmental anomaly or any pathology on lips,did not give informed consent and subjects who were allergic to lip stick, were excluded from the study.[3]

Observation:
Suzuki and Tsuchihashi classification[1]-

Type I: A clear-cut groove running vertically across the lip.
Type I′: Partial-length groove of Type I.
Type II: A Branched groove.
Type III: An intersected groove.
Type IV: A Reticular pattern.
Type V: Other patterns.

Table 1- Suzuki and Tsuchihashi classification with examples

Types of lip print	Suzuki and Tsuchihashi classification	Lip print
Type I-Vertical pattern		

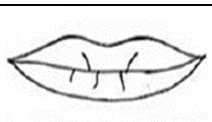
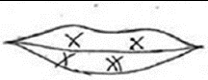
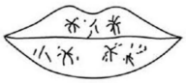
Type I′-Partial vertical pattern		
Type II- Branched pattern		
Type III-Intersected pattern		
Type IV-Reticular pattern		
Type V- Other pattern		

Table 1-Results obtained are tabulated and subjected to statistical analyses

Types of lip print	No.of samples collected	No. of Subjects with dental caries	Percentage
Type I	12	3	25%
Type I′	11	6	54.5%
Type II	32	23	71.8%
Type III	7	3	28.6%
Type IV	17	6	35.3%
Type V	8	3	37.5%

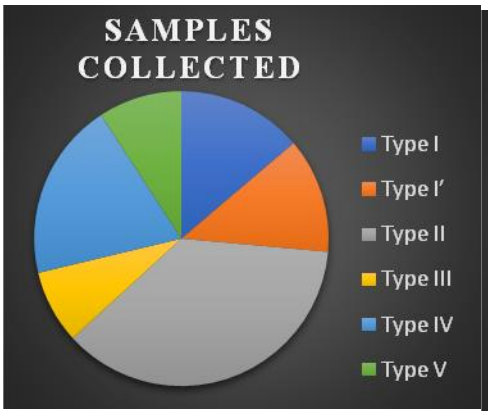


Figure 1- Total samples (87) – Classified according to Suzuki and Tsuchihashi classification (irrespective of their caries status).

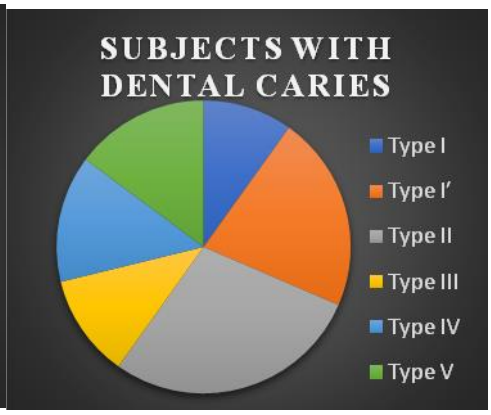


Figure 2- Percentage of Samples with their respective lip patterns classified based on their affliction to dental caries.

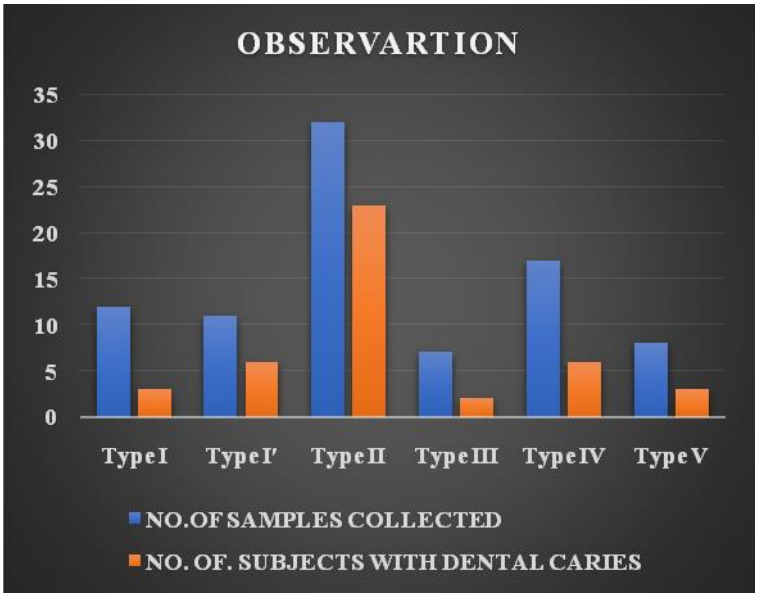


Figure 3- Relationship between cheiloscopic pattern and dental caries.

Discussion:

Different studies have yielded varying results, Tsuchihashi, in his study in Japanese population found that intersected lip pattern was the most frequent. Vahanwala and Parekh, in their study in Mumbai found that vertical lip pattern was most common. Sivapathasundharam, Prakash and Sivakumar, studied the lip prints of Indo-Dravidian population and noted that intersected lip pattern was predominant.Verghese et al., in Kerala found that reticular lip pattern showed the highest incidence.[4] The uniqueness of the lip prints of an individual indicate the role of genetics in the formation of the different patterns of the lip.[2]

The total samples collected are classified according to Suzuki and Tsuchihashi classification irrespective of their caries status [Figure 1].

Percentage of Samples with their respective lip patterns classifiedbased on their afflictionto dental caries [Figure 2].

- In vertical pattern, the subjects belonging to3 samples out of 12 were found to be afflicted with dental caries which constitutes 25%. [Table 1& Figure 3]
- In partial vertical pattern, the subjects belonging to 6 samples out of 11 were found to be afflicted with dental caries which constitutes 54.5%. [Table 1& Figure 3]
- In branched pattern, the subjects belonging to 23 samples out of 32 were found to be afflicted with dental caries which constitutes 71.8%. [Table 1& Figure 3]
- In intersected groove pattern, the subjects belonging to 3 samples out of 17 were found to be afflicted with dental caries which constitutes 28.6%. [Table 1& Figure 3]
- In reticular pattern, the subjects belonging to 6 samples out of 17 were found to be afflicted with dental caries which constitutes 35.3%. [Table 1& Figure 3]
- The other irregular pattern, the subjects belonging to 3 samples out of 8 were found to be afflicted with dental caries which constitutes 37.5%. [Table 1& Figure 3]

Result:

The present study was carried out to asses the correlation between various patterns of lip print with dental caries. It is evident that branched pattern of lip print is the most prevalent in all adults irrespective of their caries status.[2][Table 1] In the present study, it was seen that with respect to dental caries, the Branched lip pattern showed the incidence of the highest number of dental caries afflicted subjects (71.8%), followed by the partial length groove of type 1 (54.5%), which is contradictory to a study conducted by Madhusudan.K et al.[Table 1& Figure 3]

Conclusion:

The Dermatoglyphics and cheiloscopy patterns may be utilized effectively to study the genetic basis of dental caries. In a developing country like India, it might prove to be a noninvasive, inexpensive and effective tools for predicting dental caries.Since, Dermatoglyphics and cheiloscopy are still an inexact science at the present time, further extensive research and studies in this field have to be done in order to determine, ascertain and to evaluate the significance of these variations in the Dermatoglyphics and cheiloscopy features of patients with dental caries.

This study is an attempt to relate them thereby helping the practitioner to predict them. Such a prediction can be helpful to provide preventive and interceptive orthodontic treatment when necessary.The results of the current study have helped us to correlate certain patterns which might be related to specific occurrence of dental caries and their relationships. In our study, among cheiloscopic patterns, Type II (branched) pattern was predominant among all the subjects. This was in accordance to the study done by Raghav et al. and Madhusudan et al., who reported the same predominance in subjects with complete permanent dentition.

This concept of using cheiloscopic patterns and for checking the susceptibility is still at the stage of inception. Not only does it require extensive research in order to ascertain the significance of these variations in patterns, but also attempts have to be made to increase public awareness regarding the various factors which can cause these oral diseases and how this method can be used to prevent or at least control it, by studying the patterns and categorizing into risk groups and taking sufficient precautionary measures right from an early age.This could take time, a decade even, but we must work towards it, as perseverance is the secret to all triumphs.

Limitations:

Various limitations that were encountered during the study. The most important being difficulty in obtaining consent for this study.Several subjects refused to have their lip prints recorded.One of the possible reasons was the lack of awareness amongst the general population about genetics being an important etiological factor of oral ailments, and the importance of cheiloscopy in determination of disease susceptibility.Secondly, several patients did fall into one of the criteria for the study, but had to excluded due to inflammation and or/infection of lips, which was fairly common in subjects.

Additionally, inaccuracies while recording the prints, for example, insufficient coverage of epithelial surface with lip color/ink, improper positioning of lips while recording the print including movement of the subjectmay have resulted in difficulty in reading the prints.

Lack of professional knowledge of the examiners analyzing the patterns may have also resulted in errors during classification.

With respect to dental caries, in this studytaking their past caries experience into account was not possible, so predictability of lip prints and dental caries needs further studies to extrapolate the results based on gender and age classification and their relationships.

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[4].Dr. Prashant Jalannavar M.D.S(Pedodontics),Seniorlecturer, Department of Pedodontics, B.V.V.SP.M.N.M Dental College andHospital,Bagalkot,Karnataka–587101 India*Corresponding Author Dr. Rajas Prasad M.D.S(Pedodontics),Privatepractitioner,Nasik,Maharashtra–422101India Dr. Pooja Patil Intern, B.V.V.S P.M.N.M Dental College and Hospital, Bagalkot, Karnataka – 587101
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