



Correlation Between Lipprint And Dental Malocclusion In Different Ethnic Groups

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ABSTRACT

INTRODUCTION: The term "cheliology" comes from the Greek words "cheli" (lips) and "skopein" (to see). Lip prints have never been used as a diagnostic aid in orthodontics. This study was to find out the relation of lip print with dental malocclusion.

Dental malocclusion (class I, class II, and class III), as well as soft tissue face morphology, have been the subject of extensive investigation.

AIM: The goal of this study was to see if there was a link between distinct cheliologic patterns and molar relationship angle classification.

MATERIAL AND METHOD: The present study was conducted among a total of 180 individuals from age group 18 to 40 years of age on the basis of 60 individuals from Kodagu population, Karnataka population, and from Kerala population. The current study used Tsuchihashi's system for classification: Type I, Type I', Type II, Type III, Type IV, Type V of lip print.

RESULTS: Type II lip pattern was more predominant in Karnataka and Coorg population whereas in the Kerala population it was the type I lip pattern.

CONCLUSION: It has been concluded that there is a correlation between lip print and dental malocclusion and can help in determining the malocclusion in earlier stages.

KEYWORDS: Cheliology, Dental malocclusion, Lip print, Forensic tool, Orthodontics.

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I. INTRODUCTION:

Oral cavity plays an important role in functions like communication, phonetics, aesthetics, as well as emotional expressions (2).

Malocclusion is the abnormal position in relation to the basal bone of alveolar process to opposing or adjacent teeth. (3)

Lip print has been widely used in for studying various orofacial and dental conditions such as early childhood caries, malocclusion, cleft lip and palate, periodontal diseases. (4) So, this study was aimed to assess the correlation between different cheiloscopy patterns with the Angle's classification of molar relationships.

II. MATERIALS AND METHOD:

The current study included 180 people aged 18 to 40 years old, divided into three groups: 60 people from Kodagu, 60 people from Karnataka, and 60 people from Kerala. The individuals' lips were first properly cleaned and clinically checked for any deformities, scars, or anomalies. Lips that were free of all of these issues were chosen for the investigation. Dental malocclusions were checked clinically using mouth mirror and probe. (Fig1)

Lip prints can be recorded by many ways. In this study we used the lipstick cellophane method, which produced good clarity and precision of the lip print (Fig 2) The individuals were invited to sit on a dental chair, and cotton was used to clean their lips. Then, with a surgical blade no 15, a quantity of red lipstick was cut and placed in the dappen dish, with ear buds' lipstick was applied on to individual's lip. They were instructed to rub their lips together for spreading of lip stick. The cellophane paper strip was placed over the lipstick, in order to get the lip impression by dabbing it first in the center and then uniformly pressing it towards the corners of the lips (Fig 2) The lip impressions were placed on the white bond paper for permanent documentation. (Fig 3) Every precaution was taken to prevent cross contamination. Impressions were checked under magnifying lens for accurate lip pattern.

Inclusion criteria:

- Patient with Angle's class I malocclusion
- Patient with Angle's class II malocclusion
- Patient with Angle's class III malocclusion

Exclusion criteria:

- Deformities of lip
- Scar on lips

Materials used:

- Surgical blade (No. 15)
- Lipstick (ELLE 18 -Red spin)
- Ear buds
- Bond paper
- Cellophane sticky sheet

ANALYSIS OF LIP PRINT:

In the Department of Oral Pathology and forensic odontology, the lip impressions were seen using a magnifying lens.

The centre region of the lower lip, 10 mm wide, was used as the study area for classification as proposed by Sivapathasundharam et al (5)

Tsuchihashi classification of lip pattern was used for classification. (6)

- Type I – Complete vertical groove
- Type I' – Partial vertical groove
- Type II – Forked groove
- Type III – Intersecting groove
- Type IV – Reticular groove
- Type V – Undetermined groove (Fig 3)

III. RESULTS:

Table 1: Cheilosopic pattern in different molar relation in Karnataka

Cheilosopic Pattern	Class I		Class II		Class III		P-Value
	N	%	N	%	N	%	
I	8	16.7	4	36.4	1	100.0	.145
II	20	41.7	4	36.4	0	0	
III	10	20.8	0	0	0	0	
IV	10	20.8	2	18.2	0	0	
V	0	0	1	9.1	0	0	

Interpretation:

Table 1 and Graph 1 shows the lip pattern correlation with molar relation in a Karnataka population.

- Type II lip pattern was predominant (41.7%) in Class I dental relation, followed by type III and IV lip patterns (20.8%).
- In the class II dental relationship, type I and type II were the most common, accounting for 36.4 %, followed by type IV (18.2%), type V (9.1%).
- In a class III dental relationship, only the type I lip pattern (100%) was observed.

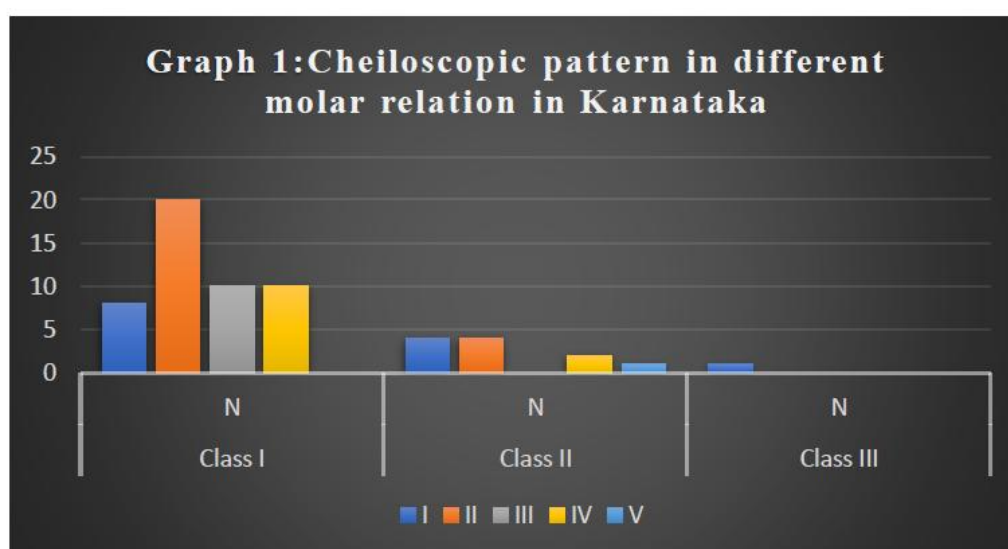


Table 2: Cheilosopic pattern in different molar relation in Coorg

Cheilosopic Pattern	Class I		Class II		Class III		P-Value
	N	%	N	%	N	%	
I	8	27.6	4	14.3	0	0	.692
II	13	44.8	16	57.1	3	100	
III	5	17.2	4	14.3	0	0	
IV	3	10.3	3	10.7	0	0	
V	0	0	1	3.6	0	0	

Interpretation:

Table 2 and Graph 2 shows the relationship between lip pattern and molar relationship in a Coorg population.

- Type II lip pattern was predominant in 44.8% of the population, followed by type I lip pattern in 27.6 % in Class I dental relation.
- In the class II dental relationship, the most common lip pattern was type I, which accounted for nearly 57.1 %, followed by type I and type III, which both accounted for 14.3%.
- In a class III dental relationship, only the type II lip pattern was observed (100%).

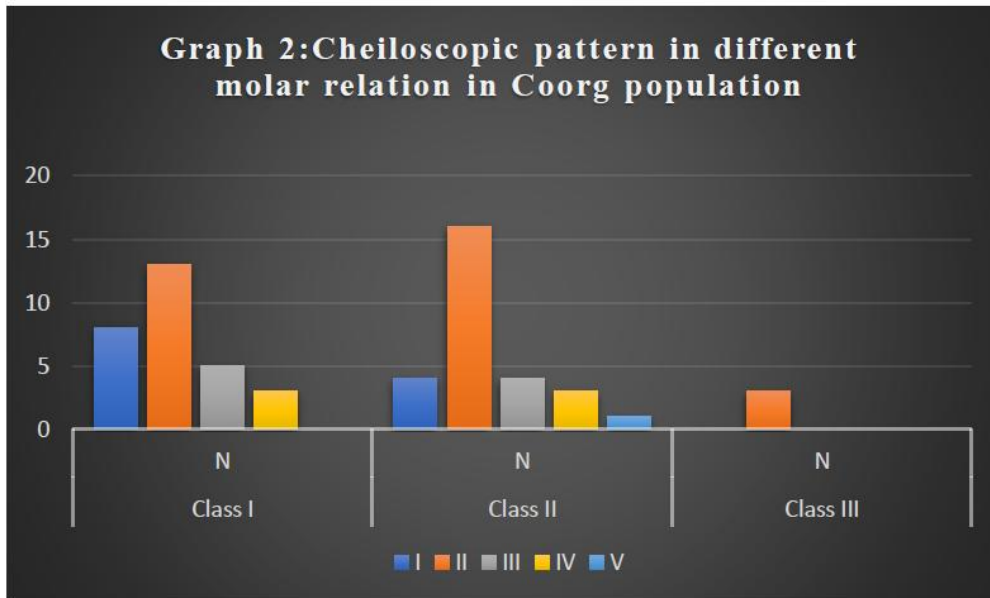


Table 3: Cheiloscopy pattern in different molar relation in Kerala

Cheiloscopy Pattern	Class I		Class II		P-Value
	N	%	N	%	
I	14	35.0	6	40.0	.628
I'	1	2.5	1	6.7	
II	12	30.0	3	20.0	
III	9	22.5	2	13.3	
IV	3	7.5	3	20.0	
V	1	2.5	0	0	

Interpretation:

Table 3 and Graph 3 shows the lip pattern correlation with molar relation in a Kerala population.

- Type I lip pattern was predominant by 35.0 %, followed by type II lip pattern by 30.0 %, in Class I dental relation.
- In Class II dental relationship, type I was the most common, accounting for 40.0 %, followed by type II and type IV, which accounted for 20.0 %.

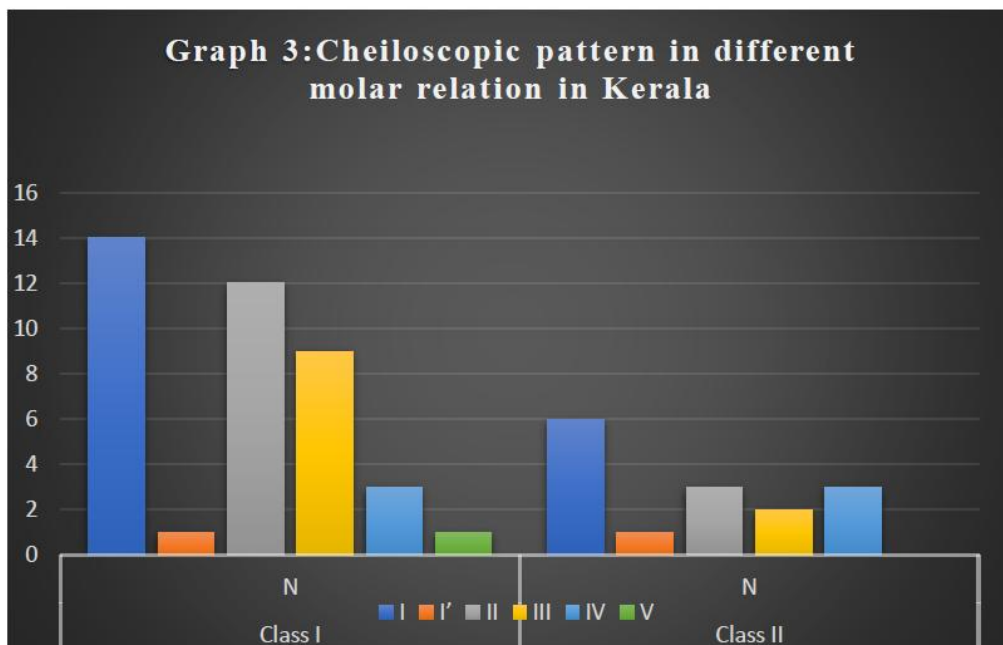
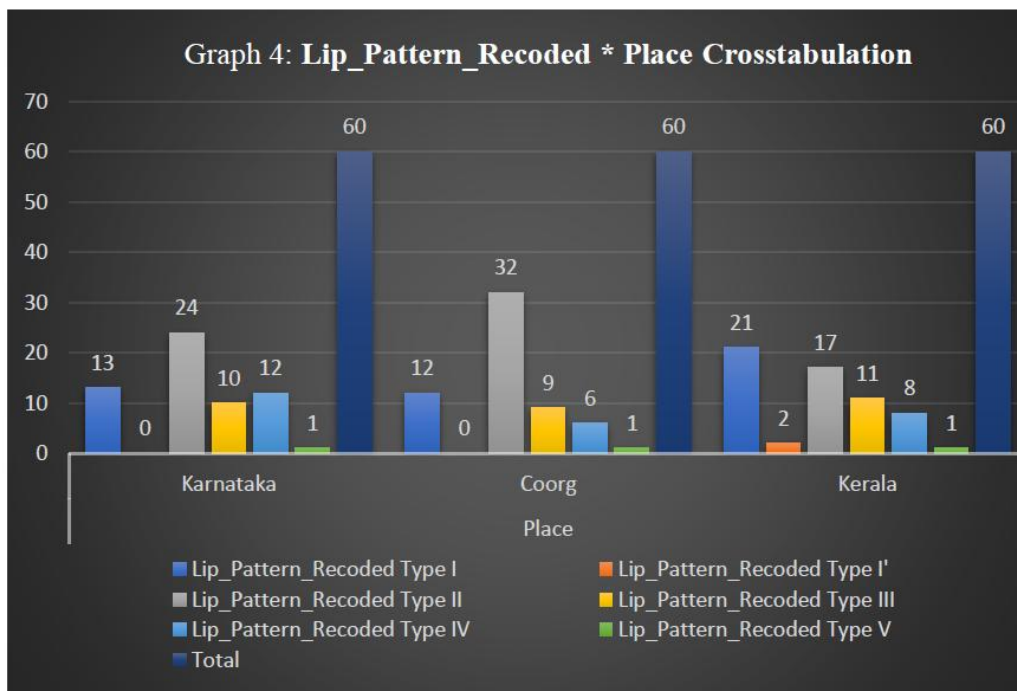


Table 4: Lip_Pattern_Recoded * Place Crosstabulation

		Place			
		Karnataka	Coorg	Kerala	Total
Lip_Pattern_Recoded	Type I	13	12	21	46
	Type I'	0	0	2	2
	Type II	24	32	17	73
	Type III	10	9	11	30
	Type IV	12	6	8	26
	Type V	1	1	1	3
Total		60	60	60	180

Interpretation: Table 4 and Graph 4 shows, Irrespective of Molar relation the type II lip pattern was more predominant in the Karnataka and Coorg Population whereas in Kerala population it was Type I lip pattern.



IV. DISCUSSION:

In 1902 itself the study of lip print gained importance, as dermatoglyphics is considered as unique which would be affected only by burns or pathology the lip print remains constant. (1)

Development of lip, alveolus and palate occurs at 24th week of intra uterine life and are of same embryonic origin. Any developmental disturbances occur in relation with alveolus affect the chelioscopic patterns. (1)

The result of study has helped us to correlate certain lip patterns with molar relation.

Parikh et al (2019) in their study showed higher prevalence of type I lip pattern and class II molar relationship. No other statistically significant values were obtained with other lip pattern and malocclusion. (7)

This study shows relation with our study where most common type I lip pattern was seen in Karnataka population with dental class II molar relation. Where type I and type II lip pattern were equally seen accounting for about (36.4%). And in Coorg population type I lip pattern accounted for about 57.1%, followed by type III pattern. As well as in Kerala population type I pattern shows 35%.

Kaushal et al (2018) observed that type II pattern was prevalent about 30% whereas type V pattern is least common 2.63% (8).

This study shows relation with our study were type II lip pattern was predominant in 41.7% in class I dental relation, with least of type V 9.1% in class II dental relation seen in Karnataka population. Also, type II pattern was predominant in 44.8% cases in class I dental relation of Coorg population. In contradiction with the study type III pattern of about 14.3% was also seen, Type II pattern of about 30% was seen in Kerala population.

Irrespective of the molar relation type II lip pattern was predominant in Karnataka and Coorg population whereas in Kerala population it was type I lip pattern.

Studies from Japanese and Indo-Dravidian populations report high incidence of type III lip-prints whereas type II and type IV lip patterns were more common in North Indian and Malayalam populations. (5,6)

In contradiction to the above study our study shows type I lip pattern was predominant about 35% followed by type II lip pattern by 30% in class I molar relation, also type I was most common for about 40% followed by type II and type IV accounted for 20% seen in Kerala population.

Raghav et al found association of lip print with type I in skeletal class III malocclusion (9) which showed a correlation with class III dental relationship of type I 100% obtained in Karnataka population.

According to verghese et al (14) type IV pattern was seen in Kerala and type II pattern in into Chinese population which show contradiction to our study where type I lip pattern of 35% followed by type II by 30% in class I dental relation as well as type I accounting for about 40% followed by type II and type IV which account for about 20% was seen in Kerala population

The result obtained cannot be related with study done by Kulkarni et al as the lip print was analyzed from all four quadrants of lip contradicting to the current study which involves only 10mm of lower lip. (10)

Study done by Vignesh et al (1) showed type II pattern was more predominantly seen in males and type IV was predominantly seen in females in class II molar relation. In our study male to female ratio comparison of lip pattern has not done.

The studies done by babu et al (11) Vahanwal et al (12), Gondikar et al (13) shows difference in lip pattern of males and females through which individual sex determination can be done with the lip patterns.

The limitation of the current study is to involve equal number of males and females in various ethnic group to get accurate prediction.

The result could help the dental practitioner to find out the malocclusion in early stages and provide adequate treatment for each individual at certain point of time period.

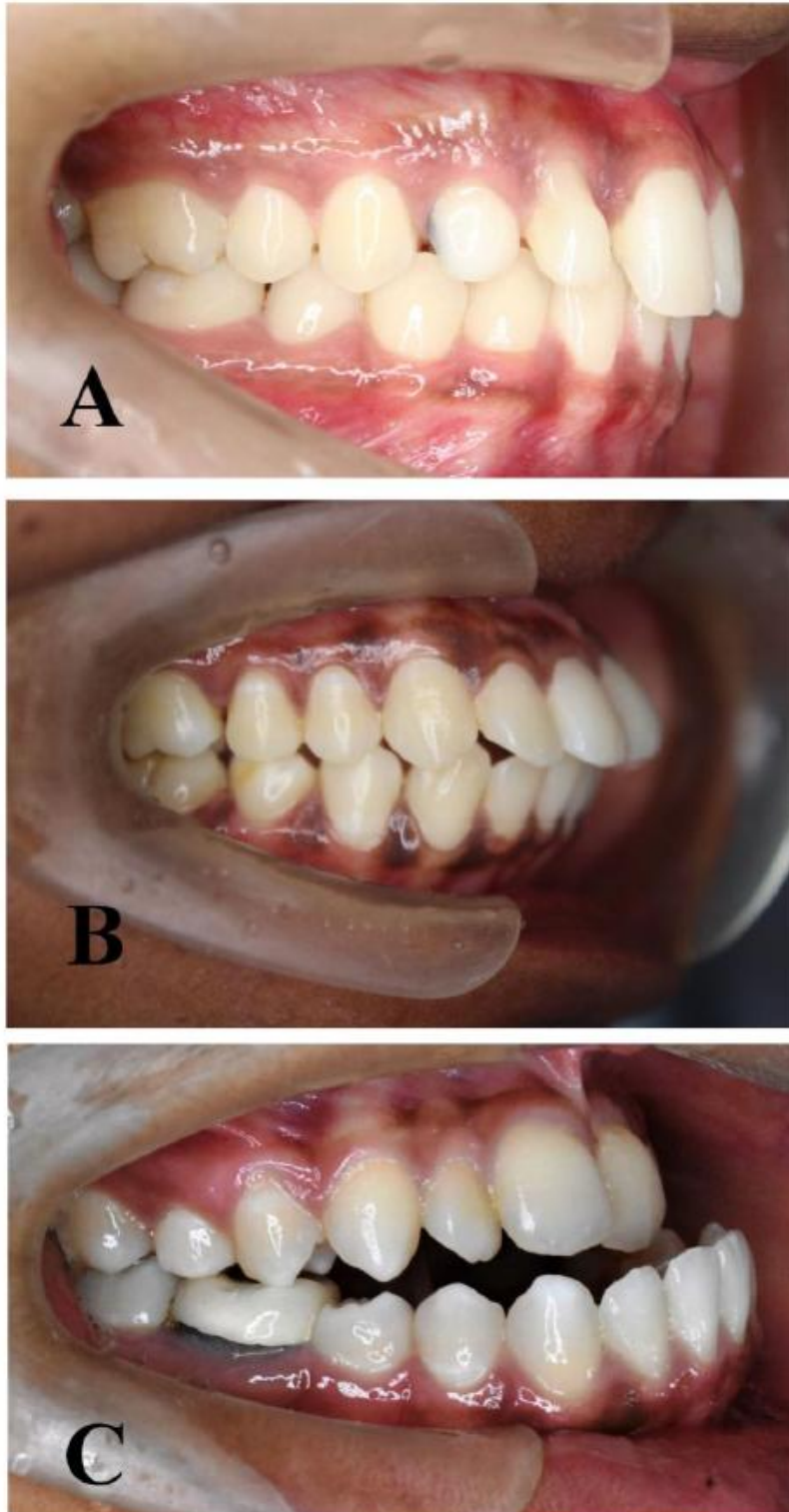
V. CONCLUSION:

Lip prints can be used as a non-invasive aiding tool for dental malocclusion. Larger sample size with equal number of male and females can be participated to find out the lip pattern would have been a better option to get an accurate reading.

- **Karnataka Population:** In a Class I molar relation type II pattern was predominant followed by type III and type IVs and class II molar relation type I and type II lip pattern was predominant followed by type IV and type V and, in a class III molar relation type I pattern was seen.
- **Coorg Population:** Type II lip pattern was predominantly seen in class I molar relation followed by type I, and type I was predominantly seen in class II followed by type I and type III in class II molar relation, and type II lip pattern was predominantly seen in class III molar relation.
- **Kerala Population:** In a Class I molar relation type I lip pattern was predominant, followed by type II. In a class II molar relation, the most common lip pattern was type I and, followed by type II and type IV.

-Irrespective of molar relation type II lip pattern was more predominant in Karnataka and Coorg population whereas in Kerala population it was type I lip pattern.

Hence we can conclude that Lip prints have a strong correlation between the Dental malocclusion and also a efficient tool in a forensic odontology.



**Fig 1: A– Angle’s class I Malocclusion ,
B–Angle’s class II Malocclusion ,
C– Angle’s class III Malocclusion**



Fig 2: Recording of Lip print



Fig 3:A-Type I,B-Type I',C-Type II,D-Type III,E-Type IV,F-Type V

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