

Genetic Studies on the Inheritance of Lip Prints in-Cleft Lip and Palate

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ABSTRACT

The last few decades have seen the development of the exaggerated importance of lip prints as another skin impression, which may be useful in identification and diagnosis of congenital diseases and anomalies. Lip prints collected from 60 parents and 2 widow mothers of 62 children with cleft lip and palate presented to the Department of Plastic Surgery - Assiut University - Egypt. Our aim was to study the various pattern types of lip prints in parents of cleft lip and palate siblings to detect if any specific pattern can be considered as a genetic marker. It is also a trial to find out if certain patterns of lip prints in parents can be used for the expectance of this type of congenital anomaly. We identified a new pattern, named type "O"; it was significantly higher in parents of cleft lip and palate patients.

INTRODUCTION

Lips have been treated in historic and anthropologic sources as well as other cultural documents as a subject both decorative and symbolic. Personality traits or certain characteristics are often attributed to a person based on the shape and use of the lips [10]. Lips are proved to have something that characterizes the human being the same as finger prints, which is the lip prints [14].

Lip print pattern is an anatomical character of the human lips. The last few decades have seen the development of the exaggerated importance of lip prints as another skin impression, which may be useful in identification and diagnosis of congenital diseases and anomalies [12].

Le Moyne Synder has first described lip prints in 1950 [14]. He stated that wrinkles and cracks on the lips might identify persons.

Suzuki et al., started their analysis of lip prints in 1963 [12]. Santos [11] proposed a classification into simple and compound types. The simple types were either straight, curved angled, or since shaped.

The compound ones were bifurcated, trifurcated, or anomalous.

Suzuki and Tsushihashi [13] introduced their classification into 6 Types (Fig. 1). Type (I) is a longitudinal grooves running through the whole width of the lip. Type (I) is partial longitudinal grooves. Type (II) is branched grooves. Type (III) is intersected grooves, Type (IV) is reticular grooves and Type (V) is undifferentiated grooves.

Hassan and Fahmy introduced their classification of lip prints into 7 types where they differentiated the branched type (II) into proximal (a)-and distal (b) branches. They also added a diagram for each lip where 6 areas were included for perfect estimation of lip prints pattern as shown in Fig. (2). They found that any type might be found at any of the 6 areas described. They didn't estimate she has further differentiated type (II) into a third subtype (IIc) that was the secondary branched type. Type (IIa) was the most frequent one in the upper lip in males with a percentage of 39%. Type (IV) was the most frequent type in the upper lip in females with a percentage of 44.4%. Type (Ia) and (IIc) were of a higher percentage (32.2%) in the lower lip in males. Type (Ia) was the most frequent one in the female lower lip [1]. Studying the inheritance of lip print patterns, Tsushihashi [15] found a proof signifies a powerful basis to suppose that the lip print has absolute dissimilarity. Afaf, et al. [3] explained the mode of inheritance of lip prints. Many authors correlated between lip prints and dermatoglyphics. Lip prints and localized juvenile periodontitis [2]. Hand dermatoglyphics and CL (P) [7]. Palmar (atd) angle and CL (P) [18]. Dermatoglyphics and CL (P) [17]. Dermatoglyphics and Down's syndrome [9]. Digital arches and FIS [4]. Dermatoglyphics and Schizo-phrenia [16]. Dermatoglyphics and Apert syndrome [5]. Dermatoglyphics and diabetes [8].

Aim of the work:

Our aim was to study the various pattern types of lip prints in parents of cleft lip and palate siblings to detect if any specific pattern can be considered as a genetic marker in the transmission of CL (P) deformity.

It is also a trial to find out if certain pattern of lip prints in parents can be used for the expectance of this type of congenital anomaly.

PATIENTS AND METHODS

Lip prints were collected from 60 parents and 2 widow mothers of 62 children with CL (P) presented to the Dep. of Plastic Surgery in Assiut University.

Lip prints were recorded by direct photography of the lips using a close-up reflex camera with colored films. A scale divided into centimeters was fixed to the inferior border of the lower lip for groove counting/cm.

Control study:

As a control study we used the study carried out by Afaf [1] who performed a detailed study on the pattern of lip prints in Lower Egypt.

Statistical analysis: The frequency of each type of lip print patterns in the 6 topographical areas was statistically correlated and its percentage was estimated p value was calculated for each one in comparison to control. The mean groove count for both the upper and lower lips in each parent was compared to the control study and p value was calculated.

RESULTS

A new pattern Type (O): We found areas devoid of grooves; in the upper lip, in the central area (B). We called it (O) because it is almost circular in arrangement. It was not recorded before in the literature and was not found to be linked to any congenital anomaly or any disease as a lip print (Figs. 4,5). Type (O) was significantly higher in mothers than fathers.

In fathers: Type (IIa) is significantly higher in the upper lip of the study group and was not presented in the lower lip of the control. Type (Ib) was not presented in the lower lip of the control. Type (IIc) was significantly higher in the control.

In mothers: Type (IIa) was significantly higher in both the upper and lower lips.

Groove count/cm: (Table 1, Fig. 6).

There was significantly high groove count in both fathers and mothers in comparison to control.

The groove count was significantly higher in fathers than mothers.

There was absolute absence of type (III) was observed in all lips of the study group.

Presence of more than one abnormality was significantly higher in mothers.

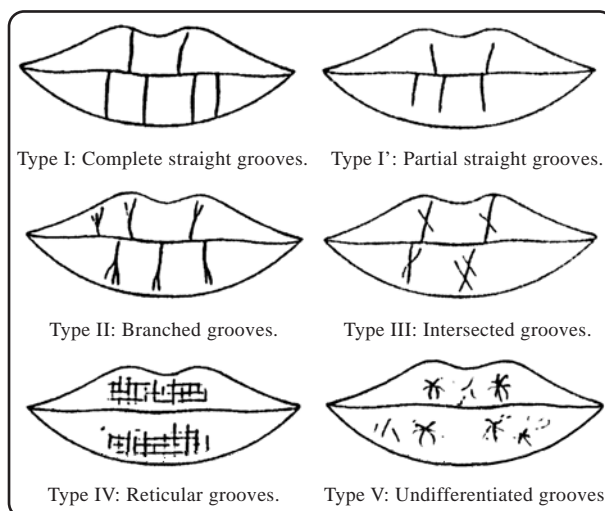


Fig. (1): The pattern of lip prints by Suzuki and Tsuchihashi (1970).

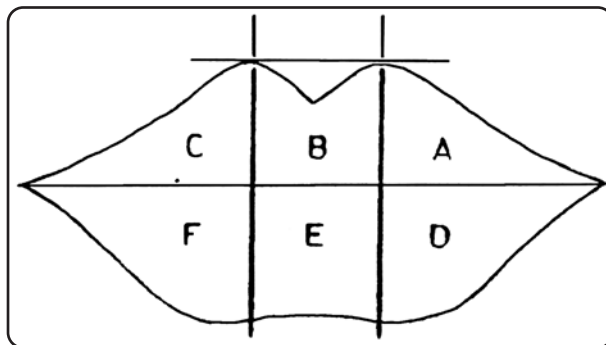


Fig. (2): The topographical areas of the lips (From Hassan & Fahmy, 1977).

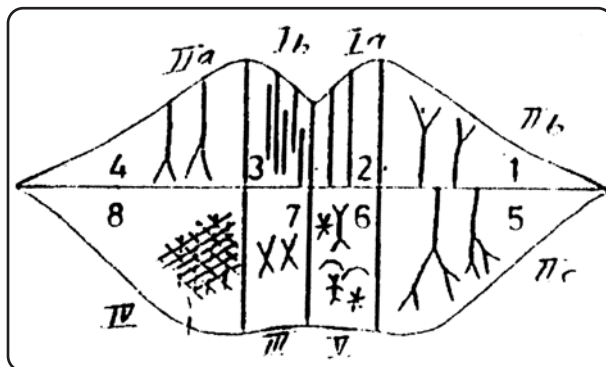


Fig. (3): The patterns of lip print by Afaf, 1984.

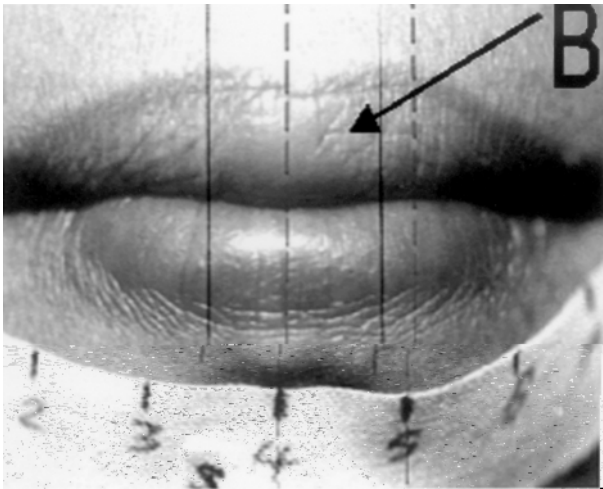


Fig. (4): A mother lip of the study group shows: Type (O) in the area (B).



Fig. (5): A father's lip of the study group shows: Type (O) in the area (B).

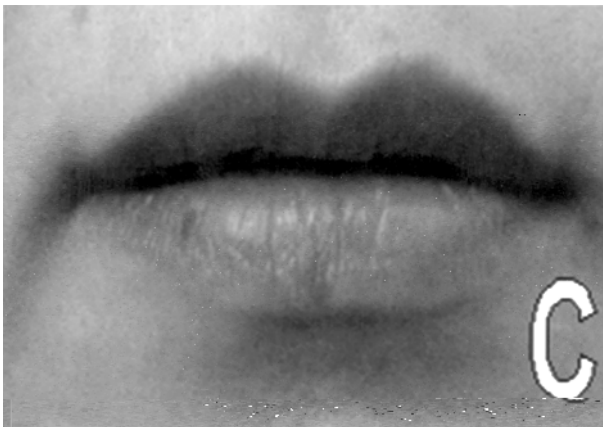
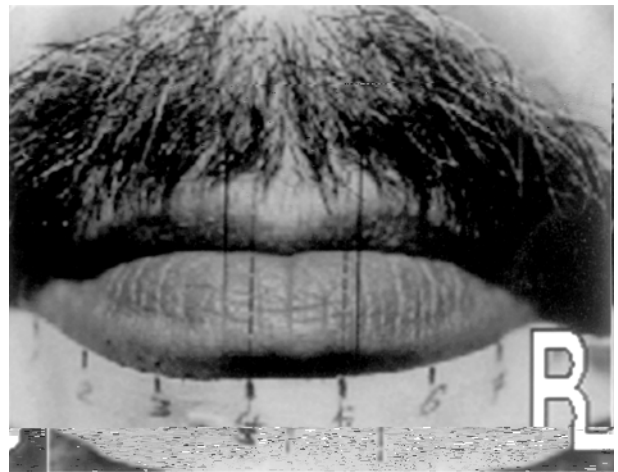
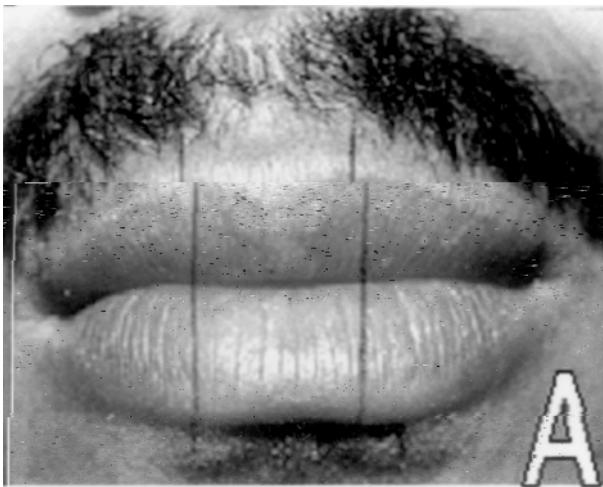


Fig. (6): Absolute high density of groove count in fathers' and mothers' lips in the study group (A&B) than in control (C).

Table (1): Groove count per centimeters of the lips. Notice the significantly high groove count in both fathers and mothers of the study group in comparison to control group.

Item	Male		Female	
	Upper lip	Lower lip	Upper lip	Lower lip
Control	9.68+1.13	8.53+1.13	7.29+0.76	6.5+0.96
Study	5.6+0.22	4.33+0.5	4.67+0.87	3.22+0.44

DISCUSSION

Predilection of CL (P) as one of the congenital disorders is considered a major advance in prevention of its occurrence or lowering its incidence than surgical repair. This primary prevention may be aided by finding something in parents' lips directly related embryologically, anatomically and/or genetically to the inheritance of the clefted

lips to siblings, that is the lip prints [3,6,15]. Lip prints develop in the same first few weeks of embryological life as the lips [15].

Lip prints, as one of the dermatoglyphics, have been used as genetic markers in many congenital and clinical diseases [3]. Also, it has been widely used in c marker for the inheritance of CL (P) deformity. In our present study, there are important statistically significant differences between the studied lip prints and the control ones.

Appearance of the new pattern (O) in other's and father's lips, which was not described before within the well known 8 lip print pattern means that those lips may possess something enhances the genetic predisposition to CL (P) deformity and the absolute significant high groove density indicates its direct relation to the appearance of the deformity.

Absolute absence of the type (III) in the study group may predispose to the appearance of CL (P) although it is transmitted by recessive gene.

The absolute absence of pattern types (Ib) and (IIa) in fathers' lower lips and the significantly high percentage of type (IIa) in mothers' lower lips declares that these types can be transmitted as recessive gene phenotype by the same major recessive gene which is primarily responsible for the genetic predisposition to CL (P).

Conclusion:

Our study has proved that lip prints and its transmission genetically are closely related to the CL (P) deformity and its mode of transmission.

We can declare that types (O), (Ib) and (IIb) and the high groove density in patients' lips could be used as genetic markers for the transmission of CL (P) deformity to siblings. Also, it can be used as predictive markers in the way preventing the appearance of CL (P) anomaly.

On the other hand, type (III) can be considered a genetic marker for the health of the offspring if appears in parents' lips.

Our study is considered the first step for 1st prevention of CL (P), which should be followed by further studies to find out the relation between lip prints in parents and their siblings with CL (P) and to correlate between these lip prints and hand dermatoglyphics as an overall study.

Further study: Studying the prints of the cleft lip children may be helpful to provide a new landmark for proper lip repair.

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