SDM
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& Hospital

"DERMATOGLYPHIC ANALYSIS OF NON FAMILIAL CLEFT CHILDREN AND THEIR UNAFFECTED PARENTS"

By

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ABSTRACT

Background:

Orofacial clefts due to known etiology comprise a small portion of individuals with cleft lip and/or palate as compared to more common isolated/ non syndromic forms of clefting. Non familial cleft lip with or without cleft palate has its highest prevalence in Asian ethnic groups. The etiology of cleft lip and palate is multifactorial, with polygenic mode of inheritance, associated with recognizable chromosomal aberrations, rare mutant genes and unknown environmental causations. These are often reflected by altered dermatoglyphics.

Dermatoglyphics is the term applied to the study of naturally occurring patterns on the surfaces of hands and feet. Clefting occurs in embryos during a time when dermal and epidermal ridges are forming. As a consequence, dermatoglyphics may serve as a marker for developmental instability and asymmetry.

Aims:

This study was undertaken to determine the fingerprint patterns, Total ridge counts, atd angle and Fluctuating asymmetry of non familial cleft children and their unaffected parents, and compare them with healthy children and their healthy parents.

Materials and Methods:

The study group included 100 cleft children with nonfamilial cleft lip and/or palate and their unaffected parents (38 fathers and 62 mothers). The control group included 100 healthy children and their healthy parents (44 fathers and 56 mothers). Types of finger print pattern on the distal phalanges, Total ridge counts of each finger (TRC) and atd angles of both the hands of all participants were recorded. Asymmetry between the right and left hands of each individual was determined. Dissimilarity between pattern

types on homologous fingers, degree of asymmetry between atd angles and Fluctuating asymmetry were compared using chi-square test. Mean TRC of all the participants and comparison between the groups was statistically analyzed using the Mann-Whitney U test.

Results:

Cleft children and unaffected parents of cleft children showed increased frequency of ulnar loops when compared with controls. Cleft children and their unaffected parents showed increased frequency of "other" types of patterns when compared with healthy children and their healthy parents which was highly significant. Mean TRC of cleft children showed no difference when compared with healthy children. Also, unaffected mothers of cleft children did not show statistical difference for mean TRC when compared with healthy mothers. However, significant differences were seen in unaffected fathers of cleft children in mean TRC when compared with healthy fathers for right index digit, right middle digit and left little digit. Cleft children and their unaffected parents showed greater degree of asymmetry in atd angle and fluctuating asymmetry when compared with healthy children and their healthy parents.

Conclusion:

The study showed differences in dermatoglyphic traits in non familial cleft children and their unaffected parents which reflects the genetic basis of this congenital malformation. This can possibly help us understand cleft phenotypes and predict the chances who are at increased risk of carrying cleft genes in their future generations ascertaining gene mapping. It can serve as a valuable and non invasive screening method in populations for early detection of inborn errors and genetic counselling.

Keywords: dermatoglyphics, non cleft parents, cleft children, screening method