Analysis of Dermatoglyphics and DMFT

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ABSTRACT

AIM
The aim of the study was to analyse the association between dermatoglyphic pattern and DMFT index.

INTRODUCTION
Dermatoglyphics is the scientific study of fingerprints, lines, mounts and shapes of hands, as distinct from the superficially similar pseudoscience of palmistry. The different types of dermatoglyphic patterns are whorl, loop, right loop, left loop, plain loop arch, simple arch. The dermatoglyphic patterns may be utilized effectively to study the genetic basis of dental caries.

MATERIALS AND METHODS
The study consisted of 50 numbers of cases obtained from saveetha dental College. An imprint of fingerprints were recorded on A4 size bond sheet. Prints were dried and studied using a magnifying lens to identify the finger prints. The various patterns were analysed and classified. The data was recorded and entered in excel sheet and imported to SPSS software and Kendall's tau_b sig.(1-tailed test) was done.

RESULT AND DISCUSSION
In the current study, it is evident that whorl pattern is the most prevalent type of dermatoglyphic pattern seen among the study population. On conducting Kendall's tau b sig 1 tailed test (P value = 0.025), results show that there is a statistically significant relationship between whorl and DMFT score. Previous Studies suggest that a specific dermatoglyphic pattern can be used as a tool for screening dental caries and DMFT score.

CONCLUSION
The current study shows a correlation between dermatoglyphic pattern and DMFT score. Whorl dermatoglyphic pattern was found to show correlation with DMFT index with 27.08 % in the female population.

KEYWORDS
Dermatoglyphics, Dental caries, DMFT, Novel analysis, Innovative technique

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INTRODUCTION

"Dermatoglyphics" is derived from Greek words in which Dermato means skin and glyphic means carving. It is a science / scientific study concerned with fingerprints mounts, shape of hands - are naturally occurring ridges - certain body parts. For several years the features of hands fascinated the scholars, sages, theologians and doctors. The terminology dermatoglyphics was coined by Harold Cummins and Charles Mildoin in 1926.[1] The science behind this involves study of fine patterned dermal ridges on digits, palms and soles, permanent imprint patterns of epidermal ridges on palmar and plantar, surfaces of hands and feet respectively.[2] Ridge pattern study popularly called 'Samudra Shastra' followed in India, ancient times classified imprints of hands and feet into "Chakra, Shankya and Padma" that correspond with whorl, loop and arch patterns of contemporary classification.[3] The pattern of ridges formed on the tips of human fingers has long been regarded as unique to every individual. These dermal patterns, once formed, remain constant throughout the life of an individual. Dermatoglyphics patterns have proved to be of diagnostic value in certain disorders like mongolism, Turner's syndrome, cardiovascular disease, diabetes, bronchial asthma and schizophrenia.[4] Over the past 150 years, dermatoglyphics has been a useful tool in understanding basic questions involving biology, genetics and evolution. Genetic contributions to the development of dental diseases have been an area of interest for many years. DMFT is the sum of the number of Decayed, Missing due to caries, and Filled Teeth in the permanent teeth. Dental caries is the major disease of dentistry and genetic factors play an appreciable part in determining individual resistance against dental caries. Studies have provided convincing evidence for a marked genetic component to dental status and dental caries experience.[5] The basis of considering dermatoglyphics patterns as a marker for dental caries is that in the embryonic period, tooth formation and the formation of finger ridge patterns begins. Dermatoglyphics analysis the integration of brain science medicine, genetics, psychology and behavioural science. This also helps in analysis of learning and thinking. Studies have proved that dermatoglyphics helps in preventing diseases, for detecting intrauterine anomalies, identifying diseases like breast carcinoma, type I diabetes mellitus. This relation between variations in dermatoglyphics and numerous diseases and syndromes can be credited to the actual fact that morphogenesis of epidermal ridges and organogenesis occurs at the same period during embryogenesis and programmed genetic expressions which are related to each other. Dental caries outcome of the interaction between certain dependent factors such as host, agent and environment. This process of caries occurrence includes demineralization of the enamel and dentin which is much dependent on pH of saliva. Various methods used to diagnose are devised clinically to quantify caries process qualitatively and one such circumspect parameter for the same is dermatoglyphics. Dental caries are multiple interlinked etiopathological components, and its relationship with epidermal ridges is explained by the fact that the teeth and dermal ridges develop from the same germ layer ectoderm during the same time period of 6th to 7th week of intrauterine life.[6] Dermatoglyphics is considered to be a window of congenital abnormalities. Diagnosing dental caries in children is a very challenging task for the dentist and providing treatment is all the more difficult.[7] It contains genetic information which is interrelated, and any disturbance seen during this period reflects on each other. Previously our team has a rich experience in working on various research projects across multiple disciplines.[8-22] Now the growing trend in this area motivated us to pursue this project. Hence, the main aim of the study was to analyse the association between dermatoglyphics and DMFT score. Our team has extensive knowledge and research experience that has translate into high quality publications.[22-42]

MATERIALS AND METHOD

Source of Data

A case controlled study consisted of 50 numbers of cases obtained from saveetha dental College. The data was collected without differences in age and sex. The armamentarium used was A4 sheets, case sheets, stamp pad, magnifying glasses, scale, gloves, and soap.

Method of collection of data

An imprint if fingerprints were recorded on A4 size bond sheet. Prints were dried and studied using a magnifying lens to identify the finger prints.

Evaluation of patterns

The various patterns were analysed and classified. The data was recorded and entered in excel sheet and imported to SPSS software and Kendall's taub sig. (1-tailed test) was done.

RESULT AND DISCUSSION

In the current study, the pie chart in Figure 1 depicts the gender of the study population. It shows 52.08 % of females and 47.92 % of males (Figure 2). The pie chart represents various dermatoglyphic patterns of the study population which includes 45.83 % of whorl, 31.2 % loop and 22.9 % arch0 (Figure 3). The bar chart represents various dermatoglyphic patterns in both the genders. 27.08 %, 12.50 % and 12.5 % of whorl, arch and loop respectively were seen in females and 18.7 %, 10.4 % and 18.75 % of whorl, arch and loop respectively were seen in males. In the current study, it is evident that whorl pattern is the most prevalent type of dermatoglyphic pattern seen among the study population. On conducting Kendall's tau b sig 1 tailed test (P value = 0.025), results show that there is a statistically significant relationship between whorl and DMFT score.

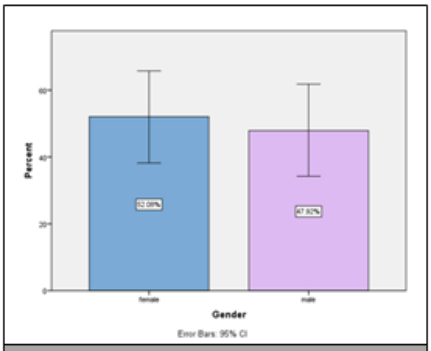

Figure 1: The Bar chart represents the gender of the study population. X axis represents the gender and Y axis represents the percentage of the responses. The graph shows 52.08% of females and 47.92% of males.

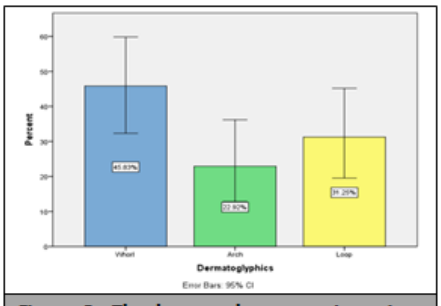

Figure 2: The bar graph represents various dermatoglyphic patterns of the study population. X axis represents the type of pattern and Y axis represents the percentage of the responses. The graphs show 45.83% of whorl, 31.2% loop and 22.9% arch pattern.

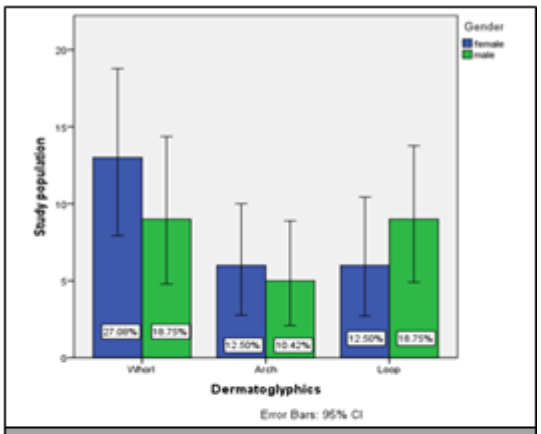

Figure 3. The bar chart represents various dermatoglyphic patterns in both the genders. X axis represents the type of pattern and Y axis represents the percentage of the samples. 27.08%, 12.50% and 12.5% of whorl, arch and loop respectively were seen in females and 18.7%, 10.4% and 18.75% of whorl, arch and loop respectively were seen in males. Chi square associations shows there is significant association between the dermatoglyphic pattern and gender which is statistically significant (p<0.05)

Previous Studies suggest that a specific dermatoglyphic pattern can be used as a tool for screening dental caries and DMFT score. Studies have shown that dental caries susceptibility of an individual increased with incidence of whorl pattern and decreased with incidences of loop pattern. The dermatoglyphic patterns may be utilized effectively to study the genetic basis of dental caries. A study by Bhat PK et shows that the frequency of whorls were found to be more in the caries group and the frequency of loops more in the caries free group. In a study, which was conducted by Abhilash et al. dental caries susceptibility of an individual increases with an increase in the incidence of whorl pattern (83 %) and it was decreased with incidence of loop pattern and in the study by Nidhi et al the result showed that the caries group showed maximum occurrence of whorls, which were more prevalent in females on the left 3rd digit than in males where the whorls were found on the right hand 3rd digit and also low total ridge count, especially males (Figure 4).

Figure 4. The above image shows arch dermatoglyphic pattern.

In a developing country like India, it might prove to be a noninvasive, inexpensive and effective tool for screening. It is also convenient, cost-effective and requires no hospitalization. It can help in predicting the phenotype of a possible future health condition. There are sparse studies of dermatoglyphic findings in children of Indian population with dental caries. Our institution is passionate about high quality evidence based research and has excelled in various fields (Figures 5 and 6). [31,43–53]

Figure 5. The above image shows loop dermatoglyphic pattern.

Figure 6: The above image shows whorl dermatoglyphic pattern.

CONCLUSION

The current study shows a correlation between dermatoglyphics pattern and DMFT score. Whorl dermatoglyphics pattern was found to show correlation with DMFT index with 27.08 % in the female population. There is a definite correlation between dermatoglyphics and Dental caries as seen in the study. A statistically significant correlation was found in relation to the increased frequency of the whorls in individuals with caries. It can serve to strengthen the diagnostic impression of the disease right from an early age and preventive oral health measures can be obtained. In addition, the oral hygiene habits of individuals with high risk can be improved by close monitoring and periodic dental check-ups. The current status of dermatoglyphics claims a very high degree of accuracy in the diagnosis and prognosis towards oral diseases. Although dermatoglyphics examination is technique sensitive, once applied, can give new dimension and reliable parameters to Dental Science.

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