Original Research

Evaluation of correlation between dental caries and fingerprints in known subjects

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ABSTRACT:

Background: The basis of considering dermatoglyphic patterns as a genetic marker for dental caries is well understood. The present study was conducted to assess correlation of fingerprints and dental caries in adult population. Materials & Methods: The present study was conducted on 140 subjects of both genders. A proforma was used regarding sugar consumption, oral hygiene methods and fluoride exposure, and recording format of decayed, missing, and filled teeth (DMFT) index. All subjects were asked to give fingerprints on a piece of paper of both hands. Results: Out of 140 patients, males were 80 and females were 60. Arch pattern was seen in 40, loop in 70 and whorl in 30 subjects. The difference was significant (P< 0.05). Mean caries index in arch pattern patients was 2.14, in loop type was 1.67 and whorl type was 2.92. The difference was significant (P< 0.05). There was positive correlation of arch type, loop type and whorl type fingerprint pattern with dental caries. The difference was significant (P< 0.05). Conclusion: There was positive correlation of arch type, loop type and whorl type fingerprint pattern with dental caries.

Key words: Dental caries, fingerprint, Loop.

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INTRODUCTION

The word “Dermatoglyphics” was coined by Cummins in 1926. It originated from two Greek words “Derma” which means skin and “Glyphics” which means carving. In ancient India, ridge pattern study was called “Samudra Shastra” and the whorls, loops, and arches visible on the ridges were, respectively, called as Chakra, Shankya, and Padma.

Dermatoglyphics is considered to be a window of congenital abnormalities. It is a sensitive indicator of intrauterine abnormalities both dental as well systemic and known to be one of the best available diagnostic tools in genetic disorders. Genetics and environmental forces play a significant role in the development of an individual’s fingerprints. The development of dermatoglyphic patterns begins to develop in the 6-7th week of gestation and is complete by the 20–24th week of gestation. The dermal ridges develop in relation to the volar pads, which are formed by the 6th week of gestation and reach a maximum size between 12th and 13th weeks. This means that the genetic message contained in the genome-normal or abnormal is deciphered during this period and is also reflected by dermatoglyphics.

The basis of considering dermatoglyphic patterns as a genetic marker for dental caries is that the epithelium of finger buds as well as epithelium of primary palate and the enamel (most susceptible tissue to dental caries have an ectodermal origin, and all develop at the same time of intrauterine life. The present study was conducted to assess correlation of fingerprints and dental caries in adult population.

MATERIALS & METHODS

The present study was conducted in the department of Anatomy of Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab, India. It comprised of 140...
subjects of both genders. The study protocol was approved from institutional ethical committee. All subjects were informed regarding the study and written consent was obtained. General information such as name, age, gender etc. was recorded. A proforma was used regarding sugar consumption, oral hygiene methods and fluoride exposure, and recording format of decayed, missing, and filled teeth (DMFT) index. All subjects were asked to give fingerprints on a piece of paper of both hands. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total- 140</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Number</td>
<td>80</td>
</tr>
</tbody>
</table>

Table I shows that out of 140 patients, males were 80 and females were 60.

Table II Type of finger prints

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch</td>
<td>40</td>
<td>0.05</td>
</tr>
<tr>
<td>Loop</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Whorl</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Table II, graph I shows that arch pattern was seen in 40, loop in 70 and whorl in 30 subjects. The difference was significant (P< 0.05).

Graph I Type of finger prints

![Graph I Type of finger prints]

Table III Caries among different fingerprint patterns

<table>
<thead>
<tr>
<th>Type</th>
<th>Mean caries</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch</td>
<td>2.14</td>
<td>0.01</td>
</tr>
<tr>
<td>Loop</td>
<td>1.67</td>
<td></td>
</tr>
<tr>
<td>Whorl</td>
<td>2.92</td>
<td></td>
</tr>
</tbody>
</table>

Table III, graph II shows that mean caries index in arch pattern patients was 2.14, in loop type was 1.67 and whorl type was 2.92. The difference was significant (P< 0.05).
Graph II Caries among different fingerprint patterns

Table IV Correlation between caries experience and fingerprint patterns

<table>
<thead>
<tr>
<th>Type</th>
<th>Correlation coefficient (r)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch</td>
<td>0.37</td>
<td>0.01</td>
</tr>
<tr>
<td>Loop</td>
<td>0.21</td>
<td>0.02</td>
</tr>
<tr>
<td>Whorl</td>
<td>0.32</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Table IV shows that there was positive correlation of arch type, loop type and whorl type fingerprint pattern with dental caries. The difference was significant (P< 0.05).

DISCUSSION

Dental caries is the most common disease in the field of dentistry. The factors leading to dental caries are complex and primarily affect the enamel. The etiology of dental caries has been advocated to various environmental and genetic factors. The level to which each factor contributes to the development and progression of caries is variable and changes on an individual basis. Since both enamel and dermal ridge pattern are ectodermal in origin and develop during the same time of intrauterine life, a study to correlate them might be helpful for prediction of caries at an early age. Therefore, dermatoglyphics might help in early prevention of caries, thereby preventing children and adults from its deleterious effects. The present study was conducted to assess correlation of fingerprints and dental caries in adult population.

In this study, out of 140 patients, males were 80 and females were 60. Arch pattern was seen in 40, loop in 70 and whorl in 30 subjects. Sanghani et al conducted a cross-sectional study on 200 children between the age range of 6–13 years. The number of whorls was found to be more in caries-active children with increased number of whorls in children with a higher DMFT whereas the number of loops was more in caries-free children. There was a statistically significant difference between the groups. The number of whorls and loops was found to be more on the right hand as compared to the left hand.

We observed that mean caries index in arch pattern patients was 2.14, in loop type was 1.67 and whorl type was 2.92. There was positive correlation of arch type, loop type and whorl type fingerprint pattern with dental caries. Sengupta et al showed a significant change in the dermatoglyphic pattern between the caries and the caries free group and reported frequency of whorls more in caries group and the frequency of loops more in caries free group. In this study, central pocket whorl and twinned loops were found to have maximum caries among the whorl pattern that has not been reported by any other studies till now.

Chinmaya et al conducted a study in which a total of 76 dental students aged 18–26 years were selected using simple random sampling. The dental caries experience was highest among students with whorl pattern (μ = 2.82) followed by the central pocket loop (μ = 2.60) and least among students with loop pattern (μ = 1.58). Furthermore, a significant relationship between twin loop pattern and dental caries was noticed (μ = 2.41); however, a
negative correlation was observed for loops and arches with dental caries.

Palm prints serve as a long-term record. They are unique to each individual. Hence, they serve as an accurate record for a particular individual. Palm print reading is quite fascinating and has inspired a lot of people in Palmistry. They also serve as genetic markers for detecting genetic diseases, diabetes, malocclusions and arch forms of an individual. They are a boon to the field of dentistry and medical disorders as they help in early prevention and detection of the disease.

CONCLUSION
Fingerprint pattern is unique. There was positive correlation of arch type, loop type and whorl type fingerprint pattern with dental caries.

REFERENCES