Existence of Dental Caries and Thumb Ridges in a Rural School Population

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ABSTRACT

Dental caries is defined as an infectious disease of microbial origin and to estimate dermatoglyphic dependence. Dermatoglyphics is the study of palmar and plantar dermal ridge carving in the hands and feet. These pattern or configurations remain constant throughout ones life. The dermal ridges take their origin from foetal volar pads that appearing the 6th and 7th week of embryonic life the same time as that of tooth formation in intra embryonic life. These ridge patterns are completed in the 12th to 14th week of gestation at the same time the tooth formation completion in intraembryonic life. Sir Francis Galton in 1892 gave the basic nomenclature of the types of finger prints. They are grouped as loops, whorls and arches. The whorls differ from the loop in the aspect of concentric arrangement of ridges. In the entire pattern the simplest pattern seen is the arch pattern. The aim of the study was to find out if any correlation exists between Thumb ridges and dental caries. A cross sectional study was performed on school children between10- 15 years, on 206 primary school children. Dental caries pattern using dft index was used. Informed consent was obtained 3 weeks prior to the study from the parents and well as form the head master of the school. The children whose index sheet was reversed and the finger prints were taken. A total of 206 school children were included in this study out of which 97 males (47%) and 109 females (52%) were included in the study. The subjects were divided in to no caries group, minimal caries group, moderate caries group severe caries group. About 96% of the subjects who has loop pattern in both the thumb had minimal or no caries compared to the whorl pattern that had minimal or moderate caries. In the loop pattern 60% were of the no caries group and 26% were of the minimal caries group. Among the mixed group 8% experienced minimal or no caries group with loop in one thumb and arch or whorl in another thumb.

KEY WORDS: Finger prints, dermatoglyphics, dermal ridges, dft index.

INTRODUCTION

Pattern formed by dermal ridges on palm show considerable variation. A number of features have been found to occur with distinctive characteristics among individuals. Dental caries is defined as an infectious disease of microbial origin and to estimate dermatoglyphic dependence. Dermatoglyphics is the study of palmar and plantar dermal ridge carving in the hands and feet. These pattern or configurations remain constant throughout ones life. This was coined by Harold Cummins who is considered father of dermatoglyphics1.

The dermal ridges take their origin from foetal volar pads that appearing the 6th and 7th week of embryonic life the same time as that of tooth formation in intra embryonic life. This means the genetic message contained in the genome normal or abnormal is...
deciphered during this period and is also reflected in dermatoglyphics\textsuperscript{2}. The size and position of these volar pads to a large extent are responsible for the type of configuration of ridge pattern. These ridge patterns are completed in the 12\textsuperscript{th} to 14\textsuperscript{th} week of gestation at the same time the tooth formation completion in intraembryonic life\textsuperscript{3}.

The word dermatoglyphics was coined by Cummins and Midlo in 1926 meaning dermi=skin and glyphe=curve. The method of recording and evaluating dermatoglyphics used in the present study is ink stamp method given by them\textsuperscript{4}.

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AIM
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MATERIALS AND METHODS
A cross sectional study was performed on school children between the age of 10-15 years. This study was performed on a group of 206 primary school children. One dentist recoded the dental caries pattern using dft index by Gruebbel in 1944. Another dentist used to record the thumb pattern of the school children. This procedure was done to avoid any inter examiner bias and variability among the dentists. Informed consent was obtained 3 weeks prior to the study from the parents and well as form the head master of the school.

Material used for study
Mouth mirrors, probes, INDEX sheet, inkpad, gauze and magnifying glass. First the student who had been seen by the dentist and his index score had been entered would come and sit with another dentist who would take a gauze wipe the thumb of the children and press the thumb on the ink pad and press over the indexed sheet. In this way we were able to get the score of the particular individual along with their thumb prints. All the subjects participated in the study except for 2 people who were absent on that day.

Recording of caries index
The caries index used here was dft index by Grubbel in 1944. The oral examination was done using the basic diagnostic instruments using natural light.

Recording of finger prints
The children whose index sheet was reversed and the finger prints were taken. The thumb was pressed on the ink pad and slight pressure was given and the thumb placed on the sheet and impression taken and the thumb prints were marked which was right and left. The obtained hand prints were then checked for the various patterns using a 4x magnifying glass.

RESULTS
A total of 206 school children were included in this study out of which 97 males (47%) and 109 females (52%) were included in the study. Subjects were within the age group of 10 – 15 years. The subjects were divided in to no caries group, minimal caries group (i.e.) 1 to 3 caries, moderate caries group (i.e.) 4 -6 caries and severe caries (i.e.) more than 7 caries. About 96% of the subjects who has loop pattern in both the thumb had minimal or no caries compared to the whorl pattern that had minimal or moderate caries. Only 2% of the subjects’ had arch pattern and the rest % had whorl in one thumb and arch in other thumb or whorl in one hand and loop in another thumb. Another 1% constituted of double loop showing moderate caries pattern

Among the 48% of the males (97) 76% had loop pattern, 70% whorl pattern and 10% arch pattern 13% mixed loop on one thumb and arch on another thumb or loop and whorl pattern. Among the subjects in loop pattern 60% were of the no caries group and 26% were of the minimal caries group. Among the whorl pattern 48% were of minimal caries group while the rest 30% had moderate caries. The arch pattern also experienced minimal or no caries group. Among the mixed group 85 experienced minimal or no caries group with loop in one thumb and arch or whorl in another thumb.

Among the 52% of the females (109) 51% had loop formation when compared to 11% of the subjects who had whorl pattern. Among the females 24% had double loop pattern and 4% had loop and whorl in their thumb and loop and double loop. There were no arches seen among the thumb prints of females. In the loop pattern 38% of the females had no caries, 12% had minimal caries and only 1% had moderate caries. Among the 24% in double loop pattern no caries was observed in 22% and only 2% had minimal caries. Among the 11% of the whorl pattern...
2% had minimal or no caries and only 9% had moderate caries.

**DISCUSSION**

The thumb print has fascinated man, doctors and layman. The modern study of the hand is far removed form the popular image of the traditional palmist uttering mysterious incantations in an arcane language. Rather through decades of scientific research, the hand has become to be recognized as a powerful tool in the diagnosis of psychological medical and general condition. The age group 10-15 years was chosen to find out the mixed dentition.

In the loop pattern 60% were of the no caries group and 26% were of the minimal caries group this is similar to the study done by Nidhi Madan et al where ulnar loops were seen on the middle finger. The arch pattern experienced minimal or no caries group. Among the mixed group 8% experienced minimal or no caries group with loop in one thumb and arch or whorl in another thumb.

Among the females 51% had loop formation, 11% of the subjects had whorl pattern, 24% had double loop pattern and 4% had loop in one thumb and whorl in the other thumb. There were no arches seen among the thumb prints of females. Among the 11% of the whorl pattern 2% had minimal or no caries and only 9% had moderate caries. A study done by Rokaya H. Ahmed states that increasing the number of ulnar loops on all fingers of both hands while, the patients with dental caries characterized by increasing the number of whorl patterns on all fingers of both hands. Sharma and Somani found that, the caries-free children showed an increased frequency of ulnar loops on the finger-tips. Metin Atasu also found that caries free students have more ulnar loops when compared to students with extensive caries had more whorls.

**REFERENCES**