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To evaluate the correlation between salivary Ph, dental caries with Dermatoglyphic in hearing impaired subjects- an in vivo study

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Abstract

Introduction: Dental caries is one of the most common diseases affecting humankind. The incidence of dental caries in hearing impaired children is 30.51%.

Aim & Objective: To evaluate the correlation between salivary ph, dental caries with Dermatoglyphic in hearing impaired subjects.

Methodology: The invivo study done consisted of 50 hearing impaired subjects which were in the age group of 3 – 10 years divided into 25 carries (DMFT) study group and 25 caries free control group. Relevant case history was taken and dental caries were recording using “DEFT” index for primary teeth and “DMFT” index for permanent teeth with the help of a right angle probe (no.17) shepherd probe(no.23) and odontoscope (mouth mirror) under natural light . Their fingerprints were recorded with duplicating ink on bond paper.

Results: The statistical association between loops, whorls and arches in caries and caries free group. The frequency of loop, arches are lower and whorls are more in caries group than caries free group.

Conclusion: Dermatoglyphic could be a suitable method to explore the possibility of a non-invasive and an early predictor for dental caries and hearing impairment in children.

Keywords: Dental caries, Dermatoglyphic, Hearing impairment

Introduction

Hearing impairment is genetically determined in about 50% of cases in childhood. Multiple studies have concluded that caries is high in these children. And the prevalence of dental caries for hearing impaired children is 30.51%in world. Dental treatment is the greatest unattended health need for these children. Moreover the treatment of dental caries is also expensive and sensitive procedure for special child. Thus it is important to prevent the disease before the onset as prevention is better than cure. Prothera of literature for the prevention of dental caries are fluoride treatment, sealant etc. But still the dental caries is major threat to population. Diagnosis at an early stage or measuring the risk assessment before

had proved to be the efficient tool in reducing the occurrence of the disease. Thus when combined with other diagnostic procedures dermatoglyphics can serve as a useful diagnostic tool. Dermatoglyphics consider to be a boon for the diagnosis in these child as it is non – invasive and it does not require the examination of the oral cavity at all. This aids in management of the fearful and sensitive child. Children with special needs have a very hard time maintaining their oral hygiene, leading to various complications from gingivitis to decay starting from a young age**.** All these are multifactorial diseases caused due to various habits and predisposing factors, which can easily be prevented. Prevention saves a lot of trauma, pain, and stressful situation for these children.

Dermatoglyphics patterns (which refer to epidermal ridges pattern types) evaluation in children has been shown to unfold genetic dependence on dental caries[1].The basis of considering dermatoglyphics pattern as genetic marker for dental caries is as follow Primary palate as well as finger buds develop from the same site and are of ectodermal origin[2]. Many studies have found a positive association between dermal pattern and caries in children but very few researches have been done on special children. This study aims to evaluate the correlation between salivary ph , dental caries with dermatoglyphics in hearing impaired subjects.

Material and Method

This study has been conducted to evaluate the correlation between salivary ph & dental caries with dermatoglyphics in hearing impaired subjects .This study was carried out in suniye support school (R.K Puram, new Delhi) for hearing impaired in collaboration with dj dental college modinagar. Written consent was taken. Ethical committee approval was taken for the institute .The invivo study done consisted of 50 Subjects which were in the age group of 3 – 10 years divided into 25 caries (DMFT) study group and 25 caries free control group. Relevant case history was taken and dental caries were recording using “DEFT” index for primary teeth and “DMFT” index for permanent teeth with the help of a right angle probe (no.17) shepherd probe(no.23) and odontoscope (mouth mirror) under natural light .

Dermatoglyphics patterns of all 5 palmer digits were recorded using cumin & mildo[3] method. First of all hand were scrubbed thoroughly with savlon on & allowed to dry. After this right hand digits were guided by the researchers to the ink stamp pad & pressed firmly against bond paper which was placed on smooth surface board 3-4 times (Fig-1). In this method third recording in the satisfactory one which is readable so impressions were recorded 3-4 times. These Dermatoglyphic patterns were analysed with the help of a magnifying glass (10x) with respect to available standards and data was tabulated (Fig-2)

Results

1. There is highly significant difference for loops between study & control group .since observed value (mean = 5.80, 3.720 at pvalue 0.002) (Table 1)

2. There is significant difference for whorls between study and control group since observed value (mean=3.040, 4.320) at p value 0.013) (Table2)

3. There is significant differences for arches between study and control group .since observed value (mean = 3.040, 2.680 at p value 0.51) (Table3)

4. There is significant difference for salivary ph between study and control groups. Since observed value (mean = 6.496, 5.360) at p value 0.001. (Table 4)

Discussion

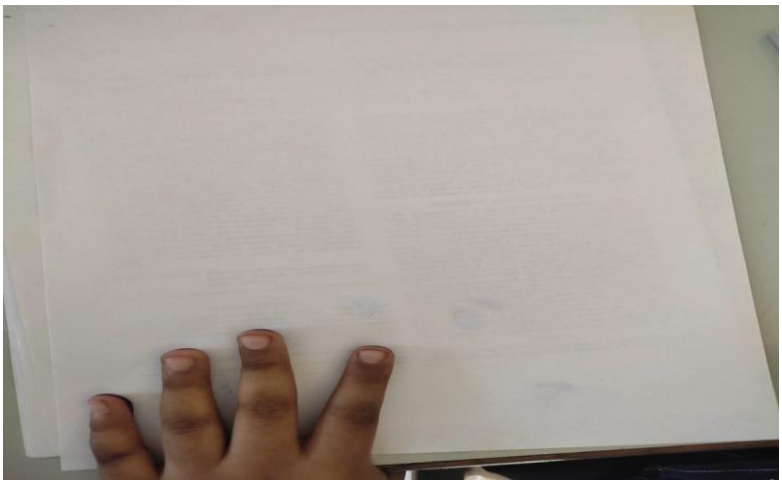
Multifactorial etiology works as a processing unit in the causation of dental caries in mineralised portions of human teeth these factors can be conveniently divided into various subtypes. In this study 2 parameter were considered ,one being genetic component that is dermatoglyphics and other being salivary component that is ph . Besides this dermatoglyphics have been reviewed by various authorities such as Mukherjee et al[4], Jain AK et al[5], Sajjd and Durrani et al[6], Kamboj. M et al[7]. This focuses at a central nidus that in the latter half of the century dermatoglyphics patterns assumed a paramount significance in many oral and systemic conditions. Dermatoglyphics patterns are broadly classified into 3 major types whorl, loop and arches .which have been subdivided into various subtypes these pattern are present on finger tips /buds whereas whole of human palm show certain other features such as atd angle ,H-loop ,IV loop, t-tri radius. In this study loop are considered, which are compared between subjects and control and correlated to salivary ph. selected children were of the age group between 3-10 years in this study because of following reasons. Firstly by 3 years of age whole set of deciduous dentition must have erupted. Secondly this period window of infectivity would have been completed. So that s.mutans levels can be measured much confidently .Thirdly we know that enamel incipient lesion transform into cavitation by 2-5 years. A study was conducted at Dayanand Medical College and Hospital, Punjab, to compare the dermatoglyphic patterns in established congenitally deaf cases with that of control healthy individuals. It was found that the frequency of whorls was more in deaf and mute group. In the present study frequency of whorls was seen higher only in the caries group. In the present study the mean DMFT score for the 6-12 years old was 5. 56, the mean DMFT score for the 6-12 years old was 4 and the mean DMFT score for 13-16 years old was 4. 58 in Deaf and mute children. These results were parallel to a study done by Behjat Almolook Ajami[8] , Mahboobeh Shabzendedar, Yar Ali Rezay ,Mohammad Asgary in 13 special schools of Iran it was observed that the caries prevalence in the 6-7-year-old deaf children with a mean DMFT score of 7. 35. The caries prevalence in 11-12-year-old deaf children was 93% with a mean DMFT.

Padma K Bhat et al[9] Studied on handicapped children attending special schools in Birmingham, UK showed mean DMFT as 1. 76 in 11-12 year old children which showed that children with impaired hearing and communication problems had better oral hygiene than other handicapped children.Caries prevalence amongst handicapped children of South Canada district in Karnataka showed the mean deft score in the primary dentition was found to be 3. 06 +/- 3. 14. The mean DEFT and DMFT in the mixed dentition were 3. 32 +/- 2. 82 and 1. 14 +/- 1. Respectively and the mean DMFT in the permanent dentition was 4. 51 +/- 3. 17. 25.

L. S. Penrose et al[10] was the person who first linked dermatoglyphics with medical science and stated dermatoglyphics patterns in downs syndrome. Which stated the absence of the medial digital crease o the little finger with congenital mental retardation. Since then effort has been directed to correlate Dermatoglyphic and various oral and systemic conditions.

Conclusion

Significant increase in loops, arches and decrease in whorls suggest the lower risk of dental caries in hearing impaired children. Thus dermatoglyphics can be recommended as a non-invasive diagnostic tool for the dental caries in special children.



Figue 1

Figure 2: Dermatoglyphic patterns of finger print

Table 1: Mean and Standard Deviation of Loops in Contrl Group and Study Groups

	GP	Mean	Std. Deviation	Std. Error Mean	T value	P value
Loops	Control	5.800	2.397	0.479	3.255	0.002 (Sig)
	Study Group	3.720	2.111	0.422		

Table 2: Mean and SD of Whorls in Contrl Group and Study Groups

	GP	Mean	Std. Deviation	Std. Error Mean	T value	P value
Whorls	Control	3.040	1.881	0.376	2.581	0.013 0.002 (Sig)
	Study Group	4.320	1.600	0.320		

Table 3: Mean and SD of arches in Contrl Group and Study Groups

	GP	Mean	Std. Deviation	Std. Error Mean	T value	P value
Arches	Control	3.040	2.051	0.410	0.659	0.519 (Non-Sig)
	Study Group	2.680	1.864	0.372		

Table 4: Mean and SD of Salivary Ph in Contrl Group and Study Groups

	GP	Mean	Std. Deviation	Std. Error Mean	T value	P value
Ph	Control	6.496	0.222	0.044	19.287	0.001 (Significant)
	Study Group	5.360	0.180	0.036		

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