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Original Research

To assess Streptococcus mutans in mother-child pairs of children with ECC

Nimrah Kawoos

Post Graduate Student, Department of Pedodontics, Seema Dental College and Hospital, Rishikesh

ABSTRACT

Background: ECC is now recognized as an infectious disease. The present study was conducted to assess Streptococcus mutans in mother-child pairs of children with ECC. **Materials & Methods:** The present study was conducted on 56 children of age 1-4 years of both genders. Dental plaque samples were collected from both mother and child. Specific primers to detect the presence of Streptococcus mutans c, e, f and k strains were designed, synthesized and validated on PCR. **Results:** Out of 56 patients, boys were 36 and girls were 20. S. mutans strains C was maximum present in 32 cases followed by e in 30, f in 29 and k in 21. The difference was significant ($P < 0.05$). S. Mutans strain c was seen in 30, f in 28, e in 27 and k in 20 children. **Conclusion:** Authors found similar number of S. Mutans strains in both children and mothers.

Key words: Caries, S. Mutans strain, Mother

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Corresponding author: Dr Nimrah Kawoos, Post Graduate Student, Department of Pedodontics, Seema Dental College and Hospital, Rishikesh

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INTRODUCTION

ECC is now recognized as an infectious disease. The first step in its development is primary infection by the bacterium S. mutans which has been identified as the primary etiologic factor in dental caries.¹ Mutans streptococci are a group of related oral bacteria that are found with a large variation in the levels of colonization in all individuals. The second step is the accumulation of these organisms to reach a pathogenic level as a consequence of frequent and prolonged oral exposure to cariogenic substrate. The final step is rapid demineralization and cavitation of enamel resulting in rampant caries.²

Recent evidence suggest a strong role of S. mutans in the onset of caries. Oral streptococci are divided into five different groups: Mutans group (prominent members are Streptococcus mutans and Streptococcus sobrinus), Salivarius group (Streptococcus salivarius), (3) Anginosus group (Streptococcus anginosus and Streptococcus intermedius), (4) Sanguinis group (Streptococcus sanguinis and Streptococcus gordonii), and (5) Mitis group

(Streptococcus mitis and Streptococcus oralis).³ Dental caries is a common chronic infectious transmissible disease resulting from tooth-adherent specific bacteria, primarily Mutans Streptococci. Early colonization of Mutans Streptococci in the oral cavity is important for the initiation of dental caries in childhood. Infants acquire Mutans Streptococci from their mothers even as early as the pre-natal period.⁴ The present study was conducted to assess Streptococcus mutans in mother-child pairs of children with ECC.

MATERIALS & METHODS

The present study was conducted in the department of Pedodontics. It comprised of 56 children of age 1-4 years of both genders. Ethical clearance was obtained prior to the study. Consent was obtained from parents of all children before the procedure.

Information such as name, age, gender etc. was recorded. Dental plaque samples were collected from all mother-child pairs. Dental plaque samples were collected from both

mother and child. The samples of pooled dental plaque were transferred to sterile Eppendorf tubes containing 1ml of buffer solution. All the samples were transported to the laboratory immediately for genotyping using arbitrarily primed PCR technique. Specific primers to detect the

presence of Streptococcus mutans c, e, f and k strains were designed, synthesized and validated on PCR. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 56		
Gender	Boys	Girls
Number	36	20

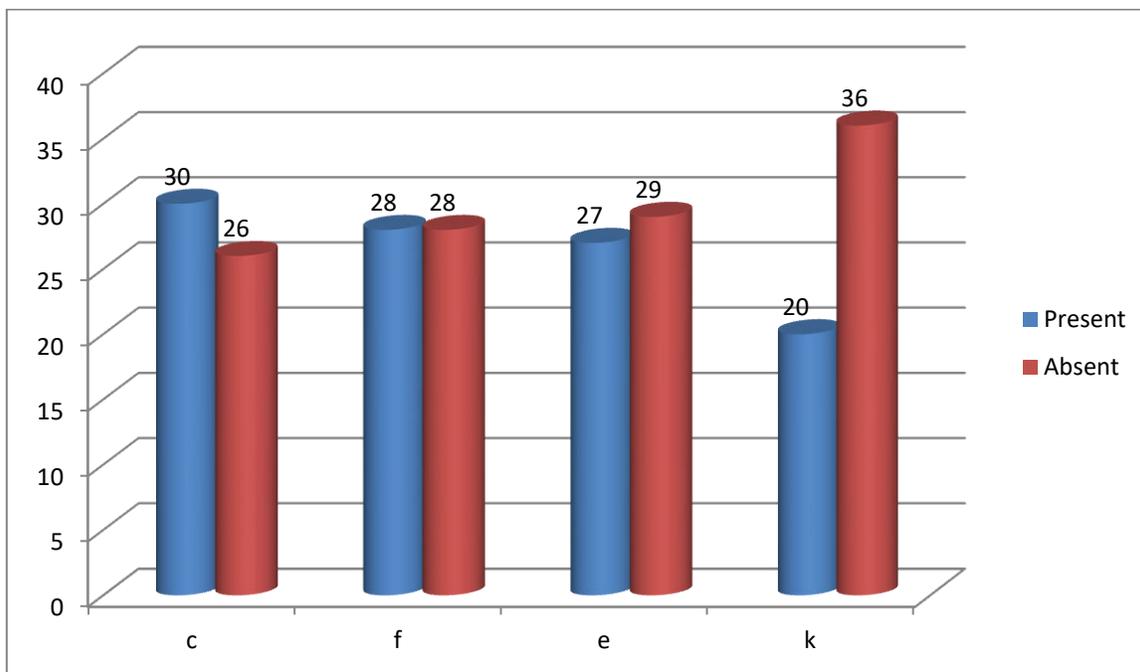
Table I shows that out of 56 patients, boys were 36 and girls were 20.

Table II Distribution of S.mutans strains in Mothers

S. Mutans	Present	Absent	P value
c	32	24	0.01
f	29	27	
e	30	26	
k	21	35	

Table II shows that S. mutans strains C was maximum present in 32 cases followed by e in 30, f in 29 and k in 21. The difference was significant (P< 0.05).

Graph I Distribution of S. Mutans strains in children



Graph I shows that S. Mutans strain c was seen in 30, f in 28, e in 27 and k in 20 children.

DISCUSSION

The most critical time for *S. mutans* colonization have been suggested to occur between 19 and 31 months, a period designated as 'the window of infectivity' with a median age of 26 months; the time of emergence of primary molars.⁵ However, there is consistent evidence that *S. mutans* may be found shortly after tooth eruption or even in pre-dentate mouths, as young as three months of age and in six month old children without teeth.⁶ The major reservoir from which infants acquired *S. mutans* is assumed to be their mothers. A positive correlation between the concentration of salivary level of *S. mutans* in mothers and their children.⁷ The present study was conducted to assess Streptococcus mutans in mother-child pairs of children with ECC.

In present study, we found that out of 56 patients, boys were 36 and girls were 20. *S. mutans* strains C was maximum present in 32 cases followed by e in 30, f in 29 and k in 21. The difference was significant ($P < 0.05$). Wan et al⁸ found that sixty mother-child pairs of healthy children aged 18-36 months were selected. Mothers with high levels of Streptococcus mutans in their saliva and only children with ECC were included. Dental plaque samples were collected from mother-child pairs. The plaque samples were stored, transferred to the laboratory and analyzed for Streptococcus mutans strains c, f, e and k, present in mother-child pairs using Real time Polymerase Chain Reaction (PCR) technique. A similar distribution of Streptococcus mutans strains c, f and k was identified in 28 mother-child pairs. Streptococcus mutans strain e was seen in 18 pairs.

We observed that *S. Mutans* strain c was seen in 30, f in 28, e in 27 and k in 20 children. Maternal transmission was found to be 33% in Japanese children in a day care setting, followed by paternal transmission (8%). There was evidence of horizontal transmission from playmates in 58% of the children. The findings of the present study are similar to that of Kohler's study, wherein 50% of children had non-maternal strains. Berkowitz et al⁹ reported evidence of maternal transmission of *Streptococcus mutans* in 81% of children, strains that could not be identified as maternal were found in 75% of children. In children with severe ECC, maternal transmission of Mutans Streptococci was seen in 41% of mother-child pairs. Majority of children (74%) had Mutans Streptococci genotypes that did not match the maternal strain.

A longitudinal study showed an increase in genotypic diversity of *Streptococcus mutans* in the oral cavity during a follow-up period. *Streptococcus mutans* and *Streptococcus sobrinus* acquired from maternal or alternative sources may show effective persistence in the oral cavity and/or transitory detection in the children's mouths, reflecting the continuous development of oral microbiota in children.¹⁰

CONCLUSION

Authors found similar number of *S. Mutans* strains in both children and mothers.

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