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ASSOCIATION OF MATERNAL ORAL HEALTH WITH THE ORAL HEALTH OF THE CHILD: AN OBSERVATIONAL CLINICAL STUDY.

Periodontics

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ABSTRACT

Context (Background): Mother plays an important role in child's life which includes her attitude, lifestyle, general health as well as oral health. Maternal indicators such as oral hygiene practices, dental caries and periodontitis are risk factors for childhood oral diseases and might be predictive of future dental diseases and periodontits. Moreover, the human lifestyle would facilitate more of horizontal transmission of microflora from mother to child.

Aim: To evaluate the association of dental caries and periodontal disease in the child of periodontally diseased and periodontally healthy mothers.

Settings & Design: Clinical parameters like plaque index, gingival index, OHIS, bleeding sites on probing, probing pocket dept, dmft (in mothers), defs (in children) in mothers and their child were evaluated.

Methods & Materials: 4 groups were included: (I) 25 female patients with untreated generalized moderate to severe chronic periodontitis (25 -50 years) (II) their child (5-15 years) (III) 25 periodontally healthy mothers (25-50 years) and (IV) their child (5-15 years).The clinical examination included registration of plaque index, gingival index, OHIS, bleeding sites on probing, probing pocket dept, dmft (in mothers), defs (in children) in mothers and their child.

Statistical Analysis used: The results were subjected to statistical analysis and a Spearmann's correlation test was done so as to evaluate association of mother's oral health to that of their child. **Results & Conclusions:** There is an association between mother's oral health with that of the child. Mothers with periodontal disease essentially had their children gingivally diseased. Mothers with good oral hygiene had an improved oral health of their child. As the education level of the mother increased, the diseased status in the child decreased.

KEYWORDS

Maternal Oral health, microflora, horizontal transmission

INTRODUCTION:

A mother plays a very important role in the upbringing of the child which moulds the attitude, lifestyle, maintenance of good general health as well as following the oral health practices. It has been found that mother's oral health has a huge impact on the dental health of the child and thus it is important for the mothers to maintain a good oral hygiene so as to prevent the dental diseases in children.[1] Studies have proved the association between mother's oral health to that of their child by horizontal transmission of microflora.[2,3,4] Moreover, studies have also shown the evidence of vertical transmission of streptococcus mutans between the mother and the child thus increasing the risk of caries in young children.[5,6,7] According to Alaluusua (1991)[8] and Watson et al (1991)[9] parents with periodontal disease may serve as a reservoir of periodontopathic bacteria for their children. Van der Velden suggested that periodontitis clusters in families[10,11], however there are studies suggesting that individuals who harbor putative pathogens frequently do not show any signs of periodontal disease and not necessarily transfer the bacteria between the family members.[12,13] But most of our human lifestyle does facilitate the horizontal transmission of microflora from the mother to the child.[3,4] Thus the aim of the present study was to evaluate the periodontal status, dental caries and oral hygiene of mothers with chronic generalized periodontitis with the periodontal status of their child and the same in periodontally healthy mothers and their child.

SUBJECTS & METHODS:

This study was conducted in the department of Pedodontics & Preventive Dentistry and the department of Periodontics of SDM college of dental sciences and hospital, Sattur, Dharwad from June 2018 to December 2018. A total of 50 mothers and their respective children of total 50 in number were included in this study. Four groups were formed which comprised of (I) 25 female patients with untreated generalized moderate to severe chronic periodontitis (25 -50 years), (II) their child (5-15 years); (III) 25 periodontally healthy mothers (25-50 years) and (IV) their child (5-15 years). The inclusion criteria comprised of healthy and periodontally diseased mothers with their children, patients with no history of systemic disease, periodontal treatment or antibiotic therapy in the past six months and patients willing to participate in the study. The mothers blessed with a single child were included in this study.

The healthy mothers had their oral cavities with no clinical evidence of inflammation and attachment loss, while mothers with chronic periodontitis were diagnosed based on the presence of gingival inflammation and periodontal breakdown with pocket depth more than 6mm in all sextants and minimum radiographic marginal alveolar bone loss less than one-third of the root length in atleast two quadrants.[14] All the patients had atleast 22 natural teeth in the oral cavity. Out of the total 50 mothers, 13 were graduates, 15 postgraduates and 22 mothers had just completed secondary education and pre university courses.

The test group comprised of the female subjects who were randomly selected in the age group of 25-50 years blessed with an only child in the age group of 5-15 years visiting the outpatient department of Periodontics of SDMCDSH, Dharwad with moderate to severe forms of periodontal disease while the control group included mothers in the age range of 25-50 years with no oral health issues and accompanying their children in the age group of 5-15 years for a routine dental checkup at the outpatient department of Pedodontics & Preventive Dentistry.

The ethical clearance was obtained by the institutional review board. The study design was explained to all the participants and a written informed consent was obtained.

Clinical examination:

The baseline examination included the registration of oral hygiene status by recording the debris index and calculus index, tooth decay, plaque index (Silness and Loe)[15] , gingival index and bleeding on probing.[14] The severity of periodontitis was determined using the consensus definitions published by the joint Center for Disease Control/American Association of Periodontology (CDC/AAP)[16] working groups wherein severe periodontitis cases were having more than or equal to two interproximal sites with clinical attachment loss more than 6mm not on the same tooth and more than one interproximal site with probing pocket depth more than 5mm; Moderate periodontitis cases had more than 2 interproximal sites with clinical attachment loss more than 4mm or more than two interproximal sites with probing pocket depth more than 5mm not on same tooth and mild periodontitis cases had more than two interproximal sites with clinical attachment loss more than 3mm and more than 2mm interproximal sites with probing pocket depth more than 4mm not on same tooth or one site with probing pocket depth more than 5mm. No periodontitis was

considered when there is no evidence of mild, moderate or severe periodontitis. These criteria were applied to all the permanent teeth except for the third molars.[16] Thus the severity of periodontitis was assessed in both the test as well as the control group and the respective children of both the groups.

In this double-blinded study, one investigator assessed the periodontal status of healthy mothers and mothers with periodontitis while the other investigator randomly measured the clinical parameters of the children.

STATISTICALANALYSIS:

The results were subjected to statistical analysis and a Spearman correlation test was performed so as to evaluate the association of maternal oral health to that of the child. A statistically significant p-value was set as < 0.05.

RESULTS:

The present study comprised of 50 females (control) with healthy dental and periodontal condition, their respective children and; 50 females (test) with moderate to severe forms of periodontitis, their respective children so as to evaluate the association of maternal oral health to that of the child. Tests of normality in the present study did signify that Mean PPD, CAL, DMFT do not follow normal distribution and hence non parametric tests were employed. **(Table 1)**

Table 1: Tests Of Normality

Tests of Normality							
		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Significance	Statistic	df	Significance
MEAN PPD	Mother	0.508	50	<0.001**	0.426	50	<0.001**
	Child	0.535	50	<0.001**	0.303	50	<0.001**
MEAN CAL	Mother	0.414	50	<0.001**	0.657	50	<0.001**
	Child	0.465	50	<0.001**	0.431	50	<0.001**
MEAN DMFT	Mother	.201	50	<0.001**	.806	50	<0.001**
	Child	.148	50	0.008**	.875	50	<0.001**

Tests of normality signify that Mean PPD, CAL, DMFT do not follow normal distribution hence non parametric tests will be employed.

The spearman correlation test showed a statistically significant positive correlation between CAL, PPD, PI, GI, OHIS of mother and child, thus revealing that as mother's oral health parameters improved so did the same of the child. The strength of association for the clinical attachment level between the mother and the child was moderate and that for the probing pocket depth was weak. Moreover, the association was strong for plaque index and oral hygiene status; and moderate for the gingival index thus implying that there was an improved oral hygiene in children with mothers with good oral hygiene. However, the strength of association of DMFT with the mother and the child was very weak. **(Table 2)**

TABLE 2:

	Spearman's rho (Correlation Coefficient)	Strength of association	Significance (p-value)
Mothers CAL vs Childs CAL	0.407	**Moderate**	**0.003**
Mothers PPD vs Childs PPD	0.327	**Weak**	**0.021**
Mothers PI vs Childs PI	0.716	**Strong**	**<0.0001**
Mothers GI vs Childs GI	0.532	**Moderate**	**<0.0001**
Mothers OHIS vs Childs OHIS	0.610	**Strong**	**<0.0001**
Mothers DMFT vs Childs DMFT	0.197	Very weak	0.170

There was significant positive correlation between CAL, PPD, PI, GI, OHIS of mother and child (as mothers oral health parameters improved so did childs)

The correlation coefficient with respect to bleeding on probing also showed a significant positive correlation between the mother and child. **(Table 3)**

Table 3

	Phi coefficient (Correlation Coefficient)	Strength of association	Significance (p-value)
Mothers BOP vs Childs BOP	0.546	**Moderate**	**<0.0001**

There was significant positive correlation between BOP of mother and child **Statistically significant p-value set at < 0.05**

There was a negative correlation between mother's education and her oral health parameters, which was statistically significant in relation to PI, GI, OHIS. Thus, as the education level increased the diseased status decreased. Similarly, there was a negative correlation between mother's education level and child's oral health parameters with statistical significant correlation with respect to OHIS. **(Table 4)**

Table 4

Variables	Mothers education		Strength of association
PI(M)	Correlation Coefficient	**-.296***	**Weak**
	Sig. (2-tailed)	**.037**	
	N	50	
PI(CH)	Correlation Coefficient	-.202	Weak
	Sig. (2-tailed)	.159	
	N	50	
GI(M)	Correlation Coefficient	**-.386****	**Weak**
	Sig. (2-tailed)	**.006**	
	N	50	
GI(CH)	Correlation Coefficient	-.087	Very weak
	Sig. (2-tailed)	.550	
	N	50	
OHIS(M)	Correlation Coefficient	**-.372****	**Weak**
	Sig. (2-tailed)	**.008**	
	N	50	
OHIS(CH)	Correlation Coefficient	**-.326***	**Weak**
	Sig. (2-tailed)	**.021**	
	N	50	
DMFT(M)	Correlation Coefficient	-.189	Very weak
	Sig. (2-tailed)	.188	
	N	50	
DMFT (CH)	Correlation Coefficient	.077	Very weak
	Sig. (2-tailed)	.596	
	N	50	

There was a negative correlation between mother's education and her oral health parameters, which was statistically significant in relation to PI, GI, OHIS.(as the education level increased the diseased status decreased) Similarly, there was a negative correlation between mother's education level and child's oral health parameters with statistical significant correlation with respect to OHIS.

DISCUSSION:

The present study evaluated the association of maternal oral health to that of the child and the results showed a positive correlation between CAL, PPD, PI, GI, OHIS of mother and child, thus revealing that as mother's oral health parameters improved so did the same of the child. Although there was a correlation between probing pocket depth and clinical attachment level between the mother and the child, the strength of association was weak. However, the association was strong for plaque index and oral hygiene status; and moderate for the gingival index thus implying that there was an improved oral hygiene in children, with mothers maintaining a good oral hygiene. Also the correlation coefficient with respect to bleeding on probing also showed a significant positive correlation between the mother and child.

Thus the findings of the present study reveal that in most of the cases, children of diseased mothers had gingivitis but no periodontitis. But it has been shown that gingivitis is an important factor predicting further development of periodontitis, and thus a longer observation period is needed to show a stronger relation between severe periodontitis in mothers and children.[17,18,19]

The present study also found a strong correlation between the oral hygiene status, plaque index, gingival index and bleeding on probing between the mother and the child. This could be attributed to the fact that mother's oral hygiene habits could influence that of their children thus predisposing them to develop gingivitis and periodontitis.[14] According to Axelsson and Alabander (1995)[22] dental plaque was one of the etiological factor in the development of gingival inflammation

further leading to periodontal destruction. Thus secondary prevention of periodontitis in children is very important which can be detected through early detection. It was observed in the present study that in the disease group, the children were essentially gingivally diseased and their mothers were periodontally diseased. This could be attributed to the fact that periodontally diseased parents may serve as the primary reservoir of periodontopathic organisms[8,9] and periodontitis clusters in families.[20,21] The early acquisition of potentially pathogenic oral bacterial species may be transmitted from the mother to the child through close household contact leading to the development of mucosal responses in the gingiva further enhancing the risk for the development of periodontitis later in life.[23] Balasouli C et al (2017)[24] found the serotype distribution of Aa in dental plaque and its transmission between mother and children. According to Pahkla et al (2009)[14] bacterial colonization will occur in the younger age period when the mother-child contact was stronger and thus the children of mothers with periodontal disease will be at a high risk of developing periodontitis. Thus the need of the hour is the identification of high-risk children so that their early treatment may help to reduce the development of periodontal disease in future.

The present study also found an association of caries between the mother and child. This could be attributed to the vertical transmission of streptococcus mutans between mother and child thus increasing the risk of caries in young children.[5,6,7]

Out of the total 50 mothers included in this study, 13 were graduates, 15 were postgraduates and 22 mothers had just completed secondary education and pre university courses and it was observed that there was a negative correlation between mother's education and her oral health parameters, which was statistically significant in relation to PI, GI, OHIS. Thus, as the education level increased the diseased status decreased. Educated mothers had maintained a good oral hygiene and their children had an improved oral health status.

SUMMARY & CONCLUSION:

Within the limitations of this study it can be concluded that,

1. There is an association between mother's oral health with that of the child.
2. Mothers with periodontal disease essentially had their children gingivally diseased.
3. Mothers with good oral hygiene had an improved oral health of their child.
4. As the education level of the mother increased, the diseased status in the child decreased.

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