

Association Between Active Parental Smoking and Gingival Pigmentation in Children

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Abstract

Aim: The goal of this study is to enhance the capacity to develop and evaluate tobacco control and prevention programme by assessing association between parental ETS and gingival pigmentation in children.

Material & Methods: A cross sectional study was conducted among 60 patients attending various departments at Ahmedabad Dental College. The labial gingival pigmentation was assessed via oral photograph according to a modification of Hedin's scale defining the degree of melanin pigmentation by the single trained calibrated investigator. Data on sociodemographic variables and parental smoking behavior was obtained through pretested structured questionnaires and was completed by the same investigator. The association was determined by using odd ratio and the data analyzed by using chi square test at 5% level of significance.

Result: An interview determined that 40% of children had at least one smoking parent. Gingival pigmentation was observed in 65% of total cases.

Conclusion: Association between parental environmental tobacco smoke exposure and gingival pigmentation in children can be useful in terms of parental educational interventions targeting smoker parents and substantially reduce exposure of children to secondhand smoke. This will blink a red light in the minds of unaware active parent smokers.

Clinical Significance: Association between parental smoking and gingival pigmentation in children helps in educating smoker parents the harmful effects passive smoking has on their child's oral health.

Keywords: Environmental Tobacco Smoke, Parental smoking, Melanin pigmentation, Gingiva, Child, Cross Sectional Study.

INTRODUCTION

Tobacco use is a significant preventable cause of disability, and premature death at a worldwide level. The adverse effects of exposure to Environmental Tobacco Smoke (ETS) are well known which include asthma, lower respiratory tract infections and effusions of middle ear.

Environmental tobacco smoke (ETS) is generated by the combustion of tobacco products. It is composed of side stream smoke (SS), emitted from the smoldering tobacco between puffs and exhaled mainstream smoke (MS) from the smoker. When a cigarette is smoked roughly half of the smoke generated is SS and the other half MS.

AIM & OBJECTIVE

To establish association between gingival pigmentation in children and active parental smoking.

MATERIAL & METHODS

Subjects & Sample Size: A cross-sectional study was conducted amongst 68 randomly selected patients attending various departments at Ahmedabad Dental College & Hospital and nearby colleges in Ahmedabad and Gujarat. 34 samples were parents who smoke and 34 samples selected were parents who do not smoke. Informed consent was obtained from all the patients.

Images of oral cavity were acquired in a standardized manner. Evaluation was carried out by the single trained calibrated investigator. Smoking status of parents of children was obtained via interview.

SUBJECT SELECTION CRITERIA:

1. Children between the ages of 6 to 18 years.
2. Exposure to active parental smoking in form of cigarette or bidi at home or at work place.
3. The child should be a non- smoker¹.

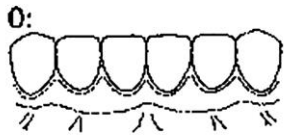
EVALUATION OF MELANIN PIGMENTATION

Gingival pigmentation was assessed in the oral photographs, which were reproduced in a computer display. These reproductions exhibited size similar to that of the actual mouth. Brownish or black pigmentation in gingiva was classified according to extent of pigmentation unit in the labial aspect of anterior teeth (Fig 1. The current technique is subjective as to date, no objective method for evaluation of gingival pigmentation has been developed.)

Gingival pigmentation was classified according to modification of melanin index categories³:

0, no pigmentation; (Fig:1) **1**, solitary unit(s) of pigmentation in papillary gingiva without formation of continuous ribbon between solitary units; and (Fig :2) **2**, At least 1 unit of formation of continuous ribbon extending from 2 neighbouring solitary units. (Fig :3)

Consequently, the reliability of this method was evaluated on the basis of inter examiner agreement: 2 examiners independently reviewed identical photographs. Examiners were trained and calibrated using typical photographs. Photographs in which visible pigmentation in the gingiva of children is apparent or lacking are presented in Fig .Gingival pigmentation of haemoglobin, melanoid, and carotene was obviously distinguishable from melanin pigmentation.⁸ Several factors such as amalgam restoration adjacent to gingiva, melanoma, and long-term usage of antimalarial drugs² and minocycline are potential confounders in terms of exposure to tobacco smoke; however, none of these parameters was applicable in this study. Status of parental smoking was withheld from the examiners³. The current investigation was approved by the Ethics Committee of Ahmedabad Dental College.



Classification according to extent of brownish or black pigmentation in labial gingiva of anterior teeth: 0, no pigmentation; (Fig 1)

1, solitary unit(s) of pigmentation in papillary gingiva without extension between neighboring solitary units; (Fig 2) and

2, formation of continuous ribbon extending from neighboring solitary units (Fig 3).

STATISTICAL ANALYSIS

Images were obtained with a digital camera (Nikon CoolPix L5, 7.0 MP). Analyses was carried out using data sets that consisted of scores of gingival pigmentations assessed by the 2 examiners on the basis of parental smoking status, gender, and age with inter examiner agreement. ORs of parental smoking with respect to gingival pigmentation were calculated. Statistical analyses were conducted with software (SPSS Version 17.0).

RESULTS

Gingival pigmentation was detected in 65% of total cases. Amongst these 40% were children of smokers. Distribution of age of parents amongst the non smoking parents was 8.97 ± 1.38 and that of smoking parents was 8.97 ± 1.38 and that of smoking parents was Grade -0 that is no pigmentation in 5(14.7%), Grade -1 that is solitary pigmentation in 17(50.0%) and Grade -2 that is continuous pigmentation in 12(35.3%) while the distribution of score of gingival pigmentation in children of non smoking parents was Grade -0 was observed in 11(32.4%), Grade -1 was observed in 18(52.9%) and Grade -2 was observed in 5(14.7%). Odds ratio of gingival pigmentation to parental smoking status was 2.774.

Prevalence of gingival pigmentation in children was not statistically significant in correlation with their smoker parents.

DISCUSSION

Examiner detected gingival pigmentation in 65% of total of children. The, subjective evaluation of gingival pigmentation in children

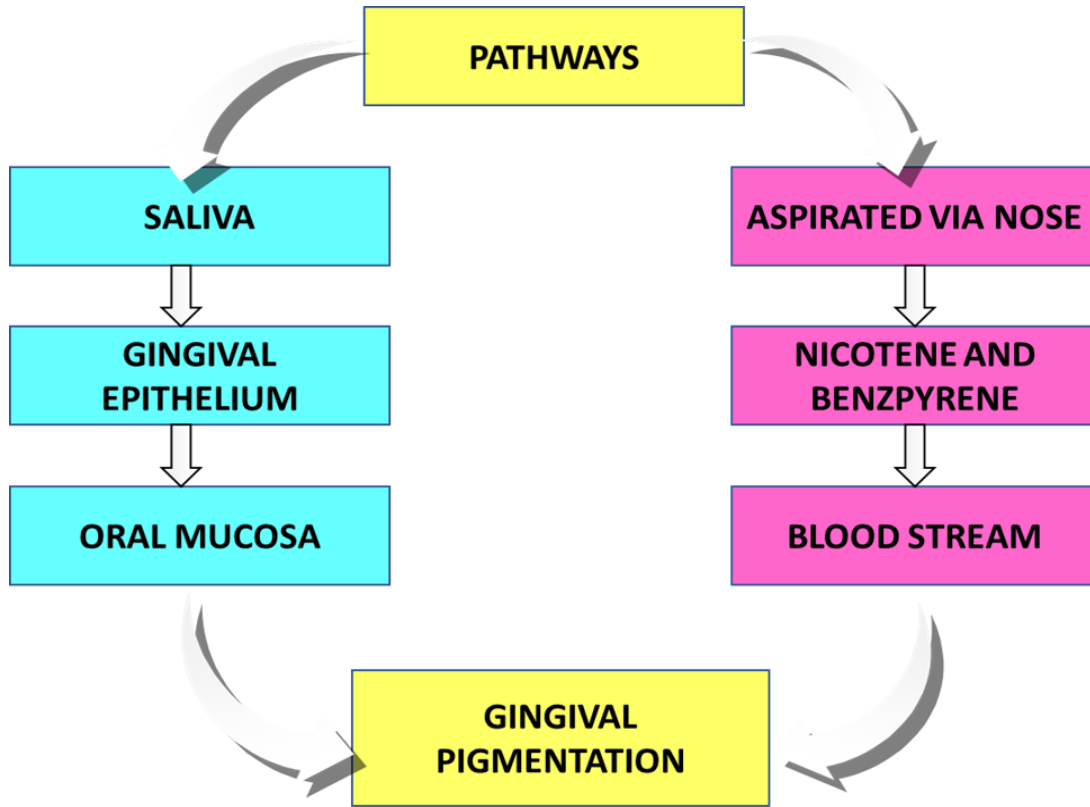
was sufficiently reliable so as to permit assessment of the association between gingival pigmentation in children and passive smoking. Two pathways by which stimulatory substances in ETS enter melanocytes gingiva of children exist. One route involves penetration through oral mucosa for the patients who are mouth breathers; the second route is characterized by delivery via the bloodstream through nose⁵. Stimulatory agents of pigmentation in ET Scan be introduced to saliva and might reach melanocytes through gingival epithelium⁶. Gingival pigmentation was often observed in labial areas where ETS may not overlap directly⁷. Furthermore, the majority of ETS is aspirated through the nose⁸. Thus, indirect stimulation by nicotine and benzpyrene in ETS of gingival pigmentation via the bloodstream may afford a more plausible explanation.

The effect of parental smoking on gingival pigmentation in children was apparent; however, because the percentage of smoking parents of children who displayed solitary pigmentation was higher, that is 50% than that of children who presented with the more distinct form of continuous pigmentation that is 35.3% the effect in terms of extent of pigmentation was not clear. Additional studies using quantitative analyses with respect to effect of ETS and gingival pigmentation could establish greater detail regarding the association between melanin pigmentation in human gingiva and passive smoking.

Gingival pigmentation might be suggestive of parental smoking; however, gingival pigmentation was frequently observed in children, although prevalence of the symptom was higher in children with smoking parents in comparison with nonsmoking counterparts. Melanocytes normally occur in the gingiva of

all humans⁹. Moreover 80% of Asian population showed ethnic pigmentation¹⁰. Therefore, clinicians should not use gingival pigmentation as an indicator of parental smoking. The present investigation suggested an association between excessive pigmentation in the gingiva of children and passive smoking.

PLAUSIBLE MECHANISM



Patient Consent Form in Gujarati (Regional Language)

સમંતિપત્ર

હું

અનેએમનીટીમનેમારાબાળકનામોઢાનુંચેકઅપ્પઅનેફોટોગ્રાફલેવામાટેનીપરવાનગીઆપુંછું.
મેઆપેલદરેકમાહિતીનીજાણકારીતેમનીસ્ટડી/રિસેર્યમાંવાપરવામાટેનીઅનુમતિઆપેલછેઅનેઆપેલમાહિતીએકદમસા
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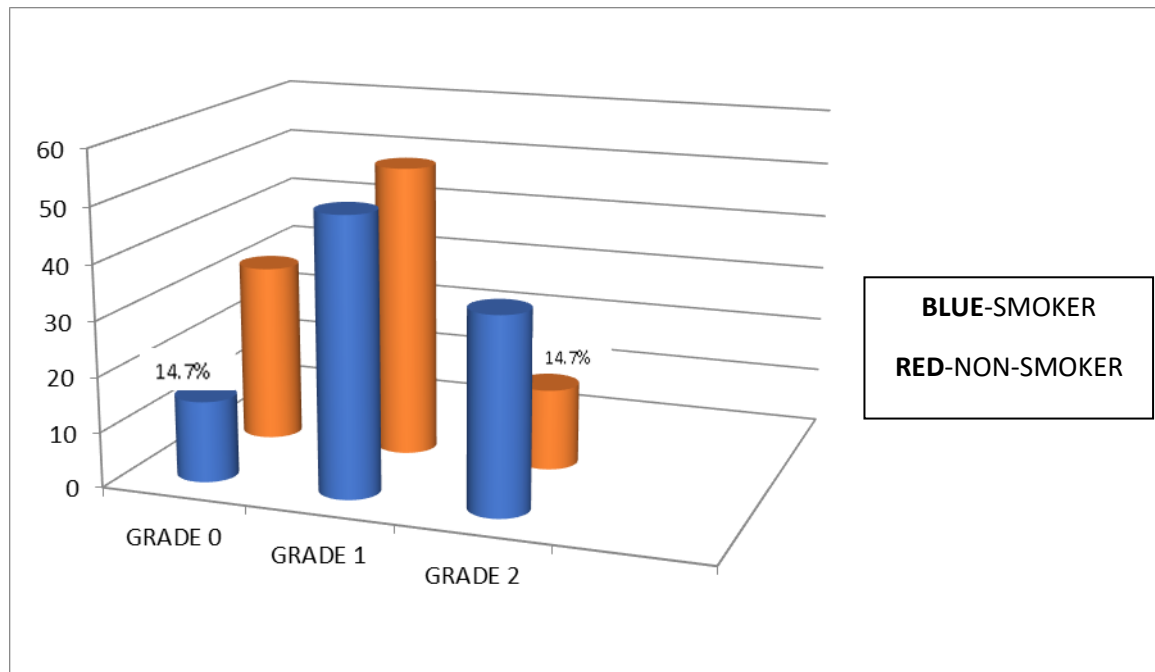
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FIGURES AND LEGENDS

DISTRIBUTION OF SMOKING PARENTS BY SCORE OF MELANIN PIGMENTATION IN CHILDREN



TABLES

DISTRIBUTION OF GENDER AND AGE BY PARENTAL SMOKING STATUS

SMOKING STATUS OF PARENTS	GENDER n=68 (%)		TOTAL	AGE MEAN±SD
	MALE	FEMALE		
NON-SMOKING	19(55.9)	15(44.1)	34	8.97±1.38
SMOKING	21(61.8)	13(38.2)	34	9.47±1.44
TOTAL	40(58.8)	28(41.1)	68	18.44±2.82

ODDS RATIO OF GINGIVAL PIGMENTATION TO PARENTAL SMOKING STATUS

	GRADE 0		GRADE 1		GRADE 2		TOTAL
	n	%	n	%	n	%	
SMOKER	5	14.7	17	50.0	12	35.3	34
NON-SMOKER	11	32.4	18	52.9	5	14.7	34

$\chi^2 = 5.16, df = 2, p = 0.075$ (NS)

ODDS RATIO OF GINGIVAL PIGMENTATION TO PARENTAL SMOKING STATUS

	CASES (WITH PIGMENTATION)	CASES (WITHOUT PIGMENTATION)
SMOKER PARENT	29(a)	5(b)
NON-SMOKER PARENT	23(c)	1(d)

ODDS RATIO = 2.774

FIG:1



FIG: 2



FIG:3

