

Oral Melaniasia and Cigarette Smoking: A Cross Sectional Study

Oral Melaniasia
and Cigarette
Smoking

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ABSTRACT

Objective: To measure the melanin pigmentation in oral cavity with its distribution and relation with cigarette smoke habit.

Study Design: Descriptive / cross-sectional study

Place and Duration of Study: This study was conducted at the Private Dental College named Liaquat College of Medicine and Dentistry (L.C.M.D), Karachi from October 2017 to November 2017.

Material and Methods: In this study we involved 378 adult aged between 18 to 35 years old those who attended free dental camp organized by L.C.M.D. The sum of 440 individual visited in O.P.D with out of these 378 means (86%) satisfied the selection criteria and contributed in this research. In sequence on socioeconomic status and proportions of cigarette habit was finding with the help of taken written interview. All participants undergo a dental intraoral assessment to examine presence of O.M on “buccal- lingual mucosa, gingival, palatal tissue, and floor of the mouth. As statically we did χ^2 statistics, the proportions check with 95% confidence intervals (C.I) for the different sets.

Results: The duration of smoking in years ($\chi^2 = 24.6$; $P < 0.001$); the severity of smoking ($\chi^2 = 68.6$; $P < 0.001$); and the type of cigarette ($\chi^2 = 25.6$; $P < 0.001$) were significantly associated with the occurrence of O.M”. In the smokers, melanin pigmentation was further regularly established on the buccal mucosa with result of chi square = 35.1 and pie values is less than 0.001; on the other hand with non cigarette smoke person the mucosa on lingual side was more regularly affected chi square = 0.02 and pie values is equal to 0.53.

Conclusion: There is a significant dose response relationship between oral melaniasis and cigarette smoking.

Key Words: Oral Melaniasis, Cigarette Smoke habit, White Lesion

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INTRODUCTION

Many studies' results show that having consistently suggested a strong relation between oral melanin and cigarette smoke habit.¹⁻⁵ with several cross sectional researches mentions that the prevalence calculate approximately for melanin is 21% in 90% cigarette smokers^{1,6}. “The term smoker's melanosis was coined by Hedin back in 1977⁷ and it has been hypothesized that this condition may be due to the physical effect of tobacco smoke on the oral tissues by heat and/or the direct effect of nicotine stimulating melanocytes located along the basal cells of the epithelium to produce more melanosomes, thus resulting in increased deposition of melanin”^{2,8}.

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Many studies have found that melanin pigments distribution¹⁻¹⁰ mostly spotlight has been advanced on the periodontal supporting tissues in cigarette smoking^{2,6} and it is not clear that the oral tissue can be affected in a same patten as compare to different among healthy individual who is not doing cigarette smoking. With this, as the conclusions of several researches propose “the existence of a dose response in the relationship between melanin pigmentations and smoking, with heavy cigarette smokers presenting more frequently with pigmentations than mild smokers^{1,4} and with subjects who have smoked cigarettes for longer periods of time presenting more frequently with melanin pigmentations than subjects who have been exposed for shorter periods of time”^{1,4,10,14}, as per our data, the potentially powerful role of the type of cigarette smoking has not been examined.

The purpose of the research were to “investigate the association between selected dimensions of exposure to cigarette smoking and O.M.P and to explore the intra-oral distribution of melanin pigmentations according to smoking status in a young adult population of volunteers attending a free dental camp for intra oral check ups”.

MATERIALS AND METHODS

On behalf of L.C.M.D we arranged a free dental examination of individuals could check for routine

dental examinations in Darul Sehat hospital during October and November 2017. The hospital covers the Gulshan Town, Karachi and counts with clinical facilities that offered the opening for arranged following cross-sectional research. We did not offer any painful consultation or swelling. We did only oral cavity assessment and counsel of individuals on maintaining oral health status. Individuals were also discussed their current carious status with need of scaling and polishing.

Study population: There were 440 individuals age between 18 to 35 years old came for free dental consultations were invited in the cross section study. In participants having “current diabetic status, current hypertensive status, inflamed and bleeding gingiva, who history of radiation, signs of oral carcinoma, and habit of betel nut or pan use not include in this study. 2 were excluded because of alcohol use, 10 having diabetes, 10 having hypertension, 27 were not included due to pan user, and 5 were not included because of related to oral cancer. 8 participants didn't want to contribute in this research thus leaving 378 (86%) individuals. In this study we included different the cigarettes smoked (for example with filter or without), the smoking duration / years (less than 5, 5 to 9, 10 to 14 and more than 14 years), and the quantity of cigarettes smoked per day.

Sample Size: The sample approximate (n=323) was calculated with 95% level of the C.I, and 50% prevalence in target population.

Ethical Considerations: The study was approved L.C.M.D in “Department of Research and Ethics” and consent in writing was given by each individual.

Variables: “All participants filled a self-administered questionnaire containing information on age, gender, smoking status (current smoker/no smoker); the duration of smoking in years (less than 5, 5 to 9, 10 to

14 and more than 14 years); and the type of cigarettes smoked (with filter or without)”.

Clinical outcome: An experienced pathologist with trained dentist who standardized against the pathologist carried out all the assessments. It's a double blind study so no one know about hypothesis. Each contributor was assist for the O.M in particular selected side of the oral cavity: “1) the buccal mucosa; 2) the lingual gingiva; 3) the buccal gingiva; 4) the hard and soft palate; and 5) the floor of the mouth”. “The term ‘oral pigmentation’ is regularly used to a wide range of lesion or conditions featuring a change of colour of oral tissue. Lesions not associated with an accumulation of melanin pigment (e.g., Fordyce spots) were not classified as pigmented lesions”¹¹. “The O.M pigmentation was dichotomized (Yes/No). For the purpose of the present analysis, the site with most prominent melanin pigmentation was considered at the individual level”.

Statistical Analysis: χ^2 used to evaluate between clusters differences, proportions differences and the corresponding 95% C.I for the participants.

RESULTS

The 103 cigarette smokers (C.S) and 275 healthy (N.S) were in this study and 1,890 selected areas were inspected for the presence of Oral Melanin pigmentation (O.M.P). There were 40 (38.8%) pigmented sites between C.S and 26 (9.5%) sites affected with N.S.

“Intraoral distribution of melanin pigmentation according to smoking status”: In cigarette smoking person, O.M.P was regularly started in the buccal site (17.5%), as with N.S the O.M.P was further common in lingual site (5.5%). The second number of O.M.P area in cigarette smokers was establish in the gingival site (7.8%) (Table 1).

Table No.1: Intraoral distribution of melanin pigmented sites according to smoking status

Sites	Smokers (n=103)		Non-Smokers (n=275)		Diff	95% CI	χ^2 statistic
	N	%	n	%			
Buccal	18	17.5	4	1.5	16	[9.5;24.5]	P<0.001, $\chi^2=35.10$
Lingual	6	5.8	15	5.5	0.4	[-4.2;7.0]	P=0.53, $\chi^2= 0.02$
Gingival	8	7.8	3	1.1	6.7	[2.4;13.5]	P=0.002, $\chi^2= 11.82$
Palatal	6	5.8	2	0.7	5.1	[1.4;11.4]	P=0.006, $\chi^2= 9.4$
Floor of the Mouth	2	1.9	2	0.7	1.2	[-1.1;6.1]	P=0.300, $\chi^2= 1.06$
Total	40	38.8	26	9.5	29.4	[19.7;39.5]	

Diff= Differences between proportions

95% CI= 95% confidence intervals for the differences between groups

χ^2 = Chi square statistics

‘Oral melanin pigmentation distributions as per smoking duration’: The maximum O.M.P sites were established in persons who cigarette smoking 14 years or more (67.5%). The rate of O.M.P was same as for individuals who had cigarette smoking between 5 to 9 years and those who is smoking 10 - 14 years. The

occurrence of pigmented sites was significantly associated with the duration of smoking in years ($\chi^2=24.56$, p<0.001). (Table 2).

‘Oral melanin pigmentation distribution as per number of cigarettes smoked each day’: Individuals exposure to do smoking minimum ten cigarettes or less a day was

considered to be “mild smokers”. The subjects’ exposure smoke more than 10 a day were considered to be “heavy smokers”⁴. The rate of O.M.P sites was considerably higher among heavy smokers ($\chi^2=68.63$, $p<0.001$) (Table 3).

‘Oral melanin pigmentation distribution as per type of cigarettes smoked each day’: Individuals who used cigarettes without filter were considerably more present with O.M.P ($\chi^2=25.56$, $p<0.001$) than did individuals smoking filtered cigarettes.

Table No.2: Distribution of melanin pigmentation among smokers according to the duration of smoking in years

Duration of Smoking	Pigmented Smoker (n=40)		Non Pigmented Smokers (n=63)	
	n	%	n	%
<5 years	3	7.5	11	17.5
5-9 years	5	12.5	9	14.3
10-14 years	5	12.5	30	47.6
>14 years	27	67.5	13	20.6

($\chi^2= 24.56$, $df= 3$, $p<0.001$)

df=degrees of freedom χ^2 = Chi square statistics

Table No.3: Distribution of melanin pigmentation among smokers according to the number of cigarettes smoked daily

Severity of Smoking	Pigmented Smoker (n=40)		Non Pigmented Smokers (n=63)		Diff	95% CI for the difference
	N	%	n	%		
Mild Smokers (< 10 cigarettes)	7	17.5	61	96.8	-79.3	[-88.4;-63.0]
Heavy Smokers (10 or more)	33	82.5	2	3.2	79.3	[63.0;88.4]

($\chi^2= 68.63$, $df= 1$, $p<0.001$)

Diff= Differences between proportions

95% CI= 95% confidence intervals for the differences between groups

χ^2 = Chi square statistics

DISCUSSION

To the best of our data, this is the first study investigative the relation between cigarette smoking with O.M.P in target population. The results of this study corroborate with previous studies suggesting “the existence of a dose-response relationship between exposure to cigarette smoking and the occurrence of oral melanin pigmentations both when exposure is measured as the number of cigarettes smoked,^{1,2,4,10} and the duration of cigarette smoking in years”^{1,4,10-16}.

The pattern of O.M.P changed for C.S and N.S, with cigarette smokers showing most regularly with O.M.P

on the buccal site as compare to N.S showed most regularly with O.M.P on the lingual site. This results is in agreement with previous findings “reported for a Nigerian population¹⁷, but deviate from the results of other studies in which the attached gingiva has been found to be the most common location for pigmentations among Swedish¹, Thai and Malaysian^{1,6,20}, and Turkish smokers”.

Our results show that on the statistically significant relationship between the cigarette smoked type (non-filtered) and higher frequency of O.M.P is novel for the oral sites investigated but is in agreement with “the results of a previous study concerning ‘reverse smoking’ suggesting that palatal mucosal changes are more frequent among users of non-filtered cigarettes”^{12,16}. Our results showed that on cigarette type smoked may reflect an extra measurement of the severity of exposure to cigarette smoke. On the other hand, this should be interpreted with caution because the habit of smoking cigarettes without filter may also be related to unknown determinants of melanin pigmentation e.g., socio-economic position, which can therefore confound the reported association.

“It can also be seen as a limitation that no attempts were made to indentify ex-smokers. However, the disappearance of O.M.P after reducing or quitting smoking has been reported in the literature^{8,21} and we do not expect that earlier exposure to smoking among ex-smokers affects the results of this cross-sectional investigation”.

CONCLUSION

Cigarette Smokers showed more regularly with O.M.P (oral melanin pigmentations) than non cigarette smokers and the association suggested a effect depend on dose. O.M.P in cigarette smokers was most common on the buccal area and individuals smoking cigarettes without filter were more commonly affected.

Author’s Contribution:

Concept & Design of Study: Muhammad Nadeem
Drafting: Muhammad Nadeem, Uzma Zareef,

Data Analysis: Uzma Zareef, Irum Munir Raja

Revisiting Critically: Muhammad Nadeem, Uzma Zareef, Irum Munir Raja

Final Approval of version: Muhammad Nadeem

Conflict of Interest: The study has no conflict of interest to declare by any author.

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