

Association of Oral Cancer and Potentially Oral Malignant Disorders with Risk Factors among Textile Industry Workers in Bangalore – A Cross Sectional Survey

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ABSTRACT

Introduction: Oral cancer is a major public health problem in India. The use of tobacco and excessive consumption of alcohol are the prominent risk factors in oral cancer. However the industrial workers observed to have increased prevalence of tobacco related habits. Hence, this study was done to assess the prevalence of tobacco related habits and potentially malignant oral disorders among the textile workers.

Material and methods: A descriptive cross-sectional survey was conducted among the textile workers in Bangalore city. A self-designed structured questionnaire was prepared to collect the data about demographic details and adverse habits. A calibrated examiner carried out clinical examinations of oral lesions. Descriptive statistics was applied and Chi-square test was used to know the association between tobacco habits and oral potentially malignant lesions

Results: Out of 850 study subjects, oral sub mucous fibrosis (OSMF) was found in 14% of the population, leukoplakia in 7% of the population, and Lichen planus in 2% of the population and erythroplakia in 1% of the population and overall prevalence of oral potential malignant disorder was found to be 23%. A significantly higher prevalence of oral potentially malignant disorders was found in individuals who were ever consumers of tobacco chewing (63%) and tobacco smoking (73%) compared to never consumers.

Conclusion: The prevalence of tobacco use and oral potentially malignant lesion was significant among the workers. Hence workplace screening among textile workers helps to prevent oral cancer.

Keywords: Oral Potentially Malignant Disorders, Oral Cancer, Tobacco Habits, Textile Workers

compared to 40% in developed countries.⁴ Oral visual screening can reduce mortality in high-risk individuals and has the potential of preventing at least 37,000 oral cancer deaths worldwide.⁵ Hence earlier detection of oral cancer offers the best chance for long term survival and has the potential to improve treatment outcomes and make healthcare affordable.⁶ However, those who work during the day may not visit screening centres or be at home during the day of the screening by a visiting health care worker. Workplace screening overcomes these challenges.⁷ Most of the people working in the industries belong to lower socio-economic and have low literacy rate. The industrial workers thus form the high-risk group in whom, it was observed to have increased prevalence of tobacco related habits.⁸ However, there are dearth of studies exploring the prevalence of tobacco related habits and potential malignant oral disorders among this group. Hence, this study was done to assess the prevalence of tobacco related habits and potentially malignant oral disorders among the textile workers.

MATERIAL AND METHODS

The present study was an observational, descriptive, cross sectional survey. Ethical clearance was obtained. The list of industries in Bangalore was made with information provided by the workers association after which appropriate permissions were obtained to conduct the screening of the employees. The factories which provided permissions were approached. The workers who were willing to participate and present at the time of examination were explained about the survey and voluntary written informed consent was obtained from all the participants. The subjects aged between 20 to 60 years, present at the time of examination were included in the study. The whole sample was taken, 850 subjects were enrolled after informed consent. A self-designed structured proforma was prepared to collect the required data. The

INTRODUCTION

Oral cancer is a major public health problem in the India where it ranks among the top three types of cancer in the country.¹ The use of tobacco, including smokeless tobacco and excessive consumption of alcohol are the prominent risk factors in oral cancer.² Oral cancer is sometimes preceded by clinically visible lesions which are noncancerous to begin with and which have therefore been termed precancerous. The most common oral potentially malignant lesions are leukoplakia, erythroplakia, and oral sub mucous fibrosis. A large number of these oral mucosal lesions have a tendency to transform into malignancy.³ Oral cancer is a potentially preventable disease, but the lack of awareness coupled with a delay in diagnosis generally results in the presentation of these lesions in their advanced stages. In India, 60–80% of patients present with advanced stages of the disease as

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proforma was prepared in local language (Kannada) which include the questions related to the socio-demographic details of the subject like Participants' name, age, gender, residential address, education and income to calculate the socio-economic status, categorized based on Kuppaswamy's classification (2014)⁹ and about adverse habits like tobacco (form and frequency in number per day and duration in years) and use of alcohol (frequency and duration in years). One trained and calibrated oral pathologist conducted all clinical examinations with the trained recorder recording the observations. The examiner was blinded for the participant's responses in the questionnaires. 100 subjects were examined per day. Two mouth mirrors were used for the examination. Digital palpation of the oral mucosa was done using gloved hands to identify the texture of oral mucosa. A thorough oral examination was performed. Following oral examination,

the participants were provided oral health education about ill effects of tobacco use.

STATISTICAL ANALYSIS

The collected data was reviewed, organized, tabulated and subjected to statistical analysis by using SPSS software (SPSS version 17.0, SPSS Inc., Chicago, IL, USA). A $p \leq 0.05$ was considered statistically significant. Age was categorized using median split procedure (≤ 40 and < 40 years). Socio economic status was categorized based on modified Kuppaswamy scale. Analysis of habits was done for individual habits (tobacco or alcohol or betel quid). Standard descriptive statistics were generated in terms of percentages, means as appropriate to provide the overall picture of the responses. Chi-square test was used to know the association between tobacco habits and oral potentially malignant lesions

RESULTS

Totally 850 subjects participated in the study. Majority of them were males (64%) and 36% were females. Age was stratified into ≥ 40 years and ≤ 40 years for data analysis. Most of the subjects (54%) belonged to the age group of ≤ 40 years and 46% belonged to the age group of ≥ 40 years. Socio-economic status (SES) was categorized based on Kuppaswamy's classification (2014), according to which SES is divided into five classes. Class I (Upper), Class II (upper middle), Class III (lower middle) Class IV and Class V (Upper lower and Lower). Out of 850 subjects, majority of the population were of class III SES 51% and 24% were of class IV SES and 25% were of class V SES (Table 1)

Table 2 depicts the prevalence of Oral sub mucous fibrosis (OSMF) was found in 14% of the population, leukoplakia in 7% of the population, and Lichen planus in 2% of the population and erythroplakia in 1% of the population and overall prevalence of oral potential malignant disorder was found to be 23%. Males (28.6%) were found to have a significantly higher prevalence of oral potentially malignant disorders compared to females. The association between lower SES and oral potentially malignant disorders was found to be statistically significant ($p < 0.05$). Almost 32%

Factors	Categories	Frequency	%
Age	20-40	459	54
	40-60	391	46
Gender	Males	544	64
	Females	306	36
SES	Class III	433	51
	Class IV	204	24
	Class V	213	25
Tobacco chewing	Ever consumers	272	32
	Never consumers	578	68
Tobacco smoking	Ever smokers	241	28.4
	Never smokers	599	72.6
Alcohol	Ever consumers	446	52.4
	Never consumers	404	47.5

Table-1: Distribution of the study subjects according to demographic factors and adverse habits

Oral potential malignant disorder	Frequency	(%)
Oral submucous fibrosis (OSMF)	119	14
Leukoplakia	60	7
Lichen planus	17	2
Erythroplakia	9	1

Table-2: Prevalence of oral potential malignant disorder according to the study subjects

Factors	Categories	Oral potential malignant disorder n (%)	P value
Age (years)	20-40	122 (26.5)	0.06
	40-60	83(20.9%)	
Gender	Males	156(28.6)	0.001*
	Females	49(16)	
SES	Class III	24(5.5)	0.05*
	Class IV	26(12.7)	
	Class V	155(72.7)	
Tobacco chewing	Ever consumers	172(63.2)	0.001*
	Never consumers	33(5.7)	
Tobacco smoking	Ever smokers	176(73)	0.001*
	Never smokers	29(4.8)	
Alcohol	Ever consumers	97(21.7)	0.065
	Never consumers	108(26.7)	

* $p < 0.05$ statistically significant; Chisquare test

Table-3: Association of socio demographic characteristics and adverse oral habits with oral potentially malignant disorders.

of the study population chewed tobacco, 28.4% smoked tobacco and 52% consumed alcohol (table 1). A significantly higher prevalence of oral potentially malignant disorders was found in individuals who were ever consumers of tobacco chewing (63%) and tobacco smoking (73%) compared to never consumers. No significant differences were observed between alcohol consumption with oral potentially malignant disorders (Table 3).

DISCUSSION

Oral cancer ranks in the top three of all cancers in India, which accounts for over thirty per cent of all cancers reported in the country.¹⁰ Oral cancer is a serious and growing problem in many parts of the globe. Oral and pharyngeal cancer, grouped together, are the sixth most common cancer in the world and sometimes preceded by clinically visible lesions which are noncancerous to begin with and which have therefore been termed precancerous. The most common oral potentially malignant lesions are leukoplakia, erythroplakia, and oral submucous fibrosis. A large number of these oral mucosal lesions have a tendency to transform into malignancy. Literature proved that a variety of oral potentially malignant disorders are associated with consumption of tobacco.¹¹ It was postulated that stress, hazardous working conditions, pace of work in the workplace drives the workers to use tobacco. In this context a cross sectional survey was conducted to assess the association of oral cancer and potentially oral malignant disorders with risk factors among textile industry workers in Bangalore. The strength of the study was larger sample which helped to improve the precision of the study findings and oral examination was carried out by single calibrated examiner which could eliminate errors due to inter-examiner variability

The present study showed that the overall prevalence of oral potentially malignant disorders in the study population was 24%. Oral sub mucous fibrosis (14%) was most commonly seen and erythroplakia was least prevalent (1%). Similar spectrum of distribution of oral potentially malignant disorders were detected in a study conducted by Ferreira AM et al.¹² Lichen planus was prevalent among 2% of the study population and this could be attributed to the stress created in the work environment. Majority of our study participants were males. There was a significant association between males and oral potential malignant disorders. This study finding was in concordance with the study conducted by Kumar S et al.³ It was speculated that the habit of tobacco consumption is more in males which may lead to development of oral potentially malignant disorders in males. The present study showed significant association between lower middle SES and Lower SES and oral potentially malignant disorders. The greatest threat of the oral cancer burden exists among the lower socioeconomic strata. This segment of the population is the most vulnerable because of higher exposure to the risk factor—tobacco—which complicates the situation further. They have the most limited access to education, prevention and treatment. These disparities should be addressed to push for provision of easy,

accessible, detection, and treatment services. Prevention through action against risk factors, especially tobacco will be key to reducing the burden amongst these groups.¹⁰ Among study participants, 32.1% used tobacco products for chewing and 28.4% smoked bidi. Similar findings were reported by Graber JM.¹³ Significant association was found between tobacco users and oral potentially malignant disorders. Tobacco was found as a strong predictor for development of oral potentially malignant disorders. More than 60 known carcinogens have been detected in tobacco. This chemical after coming in contact with oral mucosa accelerates inflammatory process and on long term abuse is responsible for atrophic and hypertrophic changes in the oral mucosa.¹⁴ Thus, few recommendations can be considered to reduce the tobacco use among the workers. The leader of the worker association can be used as oral health messenger, as they directly come in contact with the workers and it will be more effective. Dental and Medical Institutional authorities in co-ordination with the industrial authorities should conduct periodic oral and general health screening for the workers. Tobacco control policies that cover for both smoking and smokeless forms should be implemented at workplace. There are several potential limitations to this study. As the survey was conducted using convenience subject population, this may limit the generalisability of the results. The abusive behaviours of the study subjects were assessed subjectively without any biochemical validation. There is a possibility that social desirability bias might have influenced the study subjects when they answered questions related to their abusive habits.¹⁵⁻¹⁸

CONCLUSION

Textile industries use a variety of chemicals including dyes, solvents. Workers exposed to these chemicals are at a higher risk of developing cancer. Different types of cancers have been reported by several researchers among textile industry workers which includes oral cancer also. Primary oral health-care programs like dental screening at regular intervals should be made mandatory and oral health education regarding the ill effects of tobacco usage and alcohol consumption should be carried out which will help to prevent accumulation of health-care demands of the factory employees.

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