A Retrospective Study on Risk Habits Associated with the Prevalence and Severity of Oral Submucous Fibrosis in the Indigenous Population of Andaman and Nicobar Islands

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Abstract

Introduction: Very few community-based studies are centered on the native population of India and to our best knowledge this study is the first of its kind that aims to throw light on the chewing patterns and its effect on patients suffering from OSMF in the indigenous population of Andaman and Nicobar. This study aims to correlate between tobacco associated adverse habits and prevalence & severity of OSMF in indigenous population of Andaman and Nicobar Islands.

Material and Method: The study was conducted in Port Blair, Andaman in June 2014.The study population consisted of 500 residents of age 22-84 years with known tobacco usage who were screened clinically.

Results & Discussion: Nearly 144 patients were diagnosed clinically with OSMF. Thus, a prevalence rate of 28.8%, which was comparatively higher to previous tribal studies in central India. This study is novel to the Andaman Islands and served as a potential tool to educate the natives on the tobacco consumption habits.

Keywords: *Andaman, Habit control, Oral submucous fibrosis, Awareness, Quality of Life*

Introduction

Oral submucous fibrosis is a chronic insidious potentially malignant disorder exclusively affecting the oral cavity and pharyngeal region with initial vesicle formation followed by epithelial atrophy and juxta-epithelial fibroelastic changes leading to fibrosis of oral mucosa and inability to open the mouth. Betel nut alkaloids consumed with or without tobacco, in the form of areca quid is a common practice in the Indian-subcontinent and prevalence of OSMF among them is high enough to be authorizing areca nut as the etiological agent in causation of OSMF. Tobacco in its chewing and smoking form has been recognized as the major risk factor for oral cancer in India. (1)

The Andaman and Nicobar Islands comprises of a distinct population group of aboriginal tribes and migrants among whom tobacco chewing habit is rampant. Tobacco consumption is as high as 52% according to a study in 2011 among the tribal population in India, especially the lower socio-economic groups. (2) The advent of migrants from northern regions of India introduced commercial tobacco products into the society. Studies on the pattern of tobacco consumption and types of tobacco in this native population are lacking.

Very few community-based studies are centered on the native population of India and to our best knowledge this study is the first of its kind that aims to throw light on the chewing patterns and its effect on patients suffering from OSMF in the indigenous population of Andaman and Nicobar. Quality of life is vital health outcome

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measure that is relevant to patients, hence we also recorded the quality of life questionnaire from all the patients to suit the scenario. Apart from this subjective examination using VAS, questionnaires to evaluate the habit control and barriers to quit were also recorded.

Material and Method

Study setting and population: The study was conducted in Port Blair, Andaman in June 2014. The population comprised of Ranchi tribes resettled from Jharkhand region and Bangladeshi settlers resettled by the Government of India and non-settlers or migrants of Tamil, Telugu and Malayalam speaking origin. The study was conducted adhering to strict ethical protocol and written informed consent was obtained from the subjects prior to commencement of study.

Inclusion Criteria: The study population consisted of 500 residents of age 22-84 years with known tobacco usage who were screened clinically and 144 were diagnosed with Oral submucous fibrosis upon visual screening done by medical officers using criteria proposed by Bailoor and Nagesh et al.[3] Age and gender matched controls with no deleterious habits and absence of any clinically diagnosable premalignant disorders was chosen.

Exclusion Criteria: Clinically diagnosed patients with OSMF who were unwilling for incisional biopsy and patients already under treatment for OSMF were excluded from the study.

Subsequently the patient's personal history elicited tobacco consumption habits, frequency and duration of chewing among the OSMF patients. Symptoms such as burning sensation, restricted mouth opening and difficulty in swallowing were also recorded. Complete intra-oral and extra-oral examination was done and mouth-opening, check flexibility and protrusion of tongue was measured in accordance to methods proposed by Ranganathan et al. [4]

Functional staging was done according to Haieder et al. Incisional biopsy was done after routine blood investigations, in order to confirm histopathological diagnosis and grading of OSMF was done in accordance to Pindborg et al. [5][6]

Results and Statistical Analysis

Table 1 Association between Chewing habits duration/quantity and Oral Sub-mucous Fibrosis& Tumor staging

Chewing Habits duration (in Years)	OSMF	Other Lesions	Tumor Staging			p-value
			A	B	C	
No Habit	0	2	2	0	0	0.862
0 – 15	75	20	71	16	19	
16 – 30	16	10	15	0	0	
More than 30	4	0	25	0	0	
Chewing Habits Quantity	**OSMF**	**Other Lesions**	**Tumor Staging**			**p-value**
			A	**B**	**C**	
No Habit	0	1	1	0	0	0.969
1 – 10 packets	82	27	85	17	19	
11 – 20 packets	14	4	12	3	3	

Table 2: Association between Chewing Habits Quantity/Duration and Mouth Opening

Chewing Habits Quantity	Mouth Opening				p-value
	<15 mm	16 – 25 mm	26 – 35 mm	>35 mm	
No Habit	0	0	1	0	0.936
1 – 10 packets	17	19	67	18	
11 – 20 packets	3	3	8	4	
Chewing Habits duration (in Years)	**Mouth Opening**				**p-value**
	<15 mm	**16 – 25 mm**	**26 – 35 mm**	**>35 mm**	
No Habit	0	0	0	2	0.491
0 – 15	19	16	16	55	
16 – 30	3	4	5	15	
More than 30	0	0	0	4	

Table 3: Association between Smoking Duration/ Quantity per day and Functional Stage, Mouth Opening and Oral Sub-mucous Fibrosis.

Smoking Duration (in Years)	Functional Stage (p-value- 0.791)			Mouth Opening (p-value- 0.672)				OSMF (p-value- 0.535)		Other Lesion
	Stage A	Stage B	Stage C	<15 mm	16 – 25 mm	26 – 35 mm	>35 mm	Yes	No	
No Habit	76	17	20	20	17	20	56	81	8	24
0 – 15	9	2	1	1	2	1	8	6	2	4
16 – 30	11	1	1	1	1	1	10	7	2	4
More than 30	2	0	0	0	0	0	2	2	0	0
Smoking Quantity per day	**Functional Stage (p-value- 0.600)**			**Mouth Opening (p-value- 0.365)**				**OSMF (p-value- 0.059)**		**Other Lesion**
	Stage A	**Stage B**	**Stage C**	**<15 mm**	**16 – 25 mm**	**26 – 35 mm**	**>35 mm**	**Yes**	**No**	
No Habit	76	17	20	20	17	20	56	81	8	24
1 – 10 packets	16	2	2	2	2	2	14	10	2	8
11 – 20 packets	6	1	0	0	1	0	6	5	2	0

Table 4: Quality Of Life Questionaire

Method	Coefficient of correlation
Cronbach alpha	0.90
Split – half reliability	0.85

Table 5: Questionnaire for habit control (A), Barriers to Quit the Habit(B) and Subjective Examination(C)

A	Habit Control	
S.no	Question	Yes (Percentage)
1	Are you willing to quit the habit	69
2	Are you aware of withdrawal symptoms [irritability, anxiety, restlessness, increase appetite, headache, insomnia, depression, constipation, increased cough]	54
3	Are you aware of nicotine replacement therapy (NRT)	33
B	Barriers To Quit The Habit	
S.no	Reason	Response In Percentage
1 1	Tried to quit but never worked	16
2	Stress	39
3	Dependence	23
4	Compulsion	11
5	Don't know "How to say No"	7
6	Do it When "I am Bored"	4
C	Subjective Examination –Vas	
S.no	Patieny Response	Percentage
1.	No Pain	8
2.	Mild, annoying pain	12
3.	Nagging.uncomfortable,troublesome pain	32
4.	Distressing, miserable pain	29
5.	Intense, dreadful,horrible pain	14
6.	Worst possible, unbearable,excrtiating pain	5

Discussion

In our study of 500 patients with tobacco habits were included after initial screening and 144 were diagnosed clinically with OSMF. Thus, a prevalence rate of 28.8% was comparatively higher to previous tribal studies in central India by Kanna et al who provided prevalence of 6.3% (2004) and 7.2% in tribes of wayanad (2013).[7][8] In the previous studies Leukoplakia was the major oral disorder among tobacco abusers and smoking was more predominant with beedi smoking being the chief habit. Since among our population of native Andaman tribes smokeless tobacco and areca nut chewing was rampant as compared to smoking form of tobacco our study reflects a higher prevalence rate of OSMF.[9]

The patients diagnosed with OSMF were in the mean age of 34.7 years which is consistent with previous

studies by Haider et al (2000).(10) This is much higher compared to studies conducted in 2009 by Ceena et al where they found the average age range was 26 years and majority of cases were in the age range of 21-30 years thereby concluding that the younger age group was more susceptible to both areca chewing habit and occurrence of OSMF.[11] Previous tribal studies have shown a high prevalence of 52.07-63% of smokeless tobacco use among the adolescent population with mean age range of 13-49 years with average age of initiation of smokeless tobacco use being at least 13.7 years.[12][13] The difference in the distribution among our study population can be attributed to it being majorly migrated population now native to the island for few decades, and indigenous tribes. The mean age of occurrence of OSMF seems to be a decade away from mean age of initiation of smokeless tobacco habit.

Among the OSMF patients 37% were females and 63% were males thus showing a male predominance similar to studies by Ranganathan et al and Pandya et al (2009).[14][15] Nevertheless studies by Jhonson et al (2000) showed female preponderance among OSMF patients. To best of our knowledge no studies have analyzed OSMF prevalence among native population in Andaman and Nicobar Islands.

Among the 500 smokeless tobacco chewers the most prevalent habit was chewing of indigenously made Paan masala with tobacco (36.4%) followed by Supari and Zarda. Areca-nut chewing (15%) was more popular among the female population. Among the 140 OSMF patients 51 patients chewed Paan alone or in combination with other habits. Paan is a combination of areca-nut catechu, lime and flavoring agents and chewed along with betel leaf at homes or available as commercial mixtures along with tobacco. Areca nut alone causing OSMF was previously documented in studies by Van Wyke et al.[16] Since these mixtures are predominantly prepared by self, they tend to consume more dry weight of areca-nut which further induces fibrosis of oral mucosa at an earlier stage and consuming them for longer periods causes addiction and dependency.

The presence of burning sensation was the most prevalent complaint of OSMF patients (72.8%) and most common cause of reporting to a dental check-up following which 46.4% of patients complained of difficulty in mouth opening while 12.85% presented with no previous symptoms and were unaware of suffering from the disease.

Among the OSMF patients 102 had mouth opening >/= 20mm which is comparable to previous study by Ara et al, 16 patients had mouth opening of 11-19mm and 22 patients suffered from mouth opening less than 10mm.[17]

Among the OSMF patients 53.6% had chewing habits for a duration of <15 years and 11.4% from 16-30 years only 4.2% of habits greater than 30 years developed OSMF. The association between duration of tobacco chewing and advent of OSMF in these patients were compared by chi-square was not significant (p=0.089). Among them majority of the patients who chewed <10 packets of smokeless tobacco were classified as Stage A of OSMF according to functional staging (60.7%) while the 13.6% of patients with chewing habits between 10-20 packets predominantly developed Stage C OSMF. These results are comparable to previous studies by Ahmed et al who also found that severity of OSMF increased in correlation to the frequency and duration of smokeless tobacco abuse.[18] In other studies by Rajendran et al they deduced that though frequency or no. of packets of smokeless tobacco had direct relationship with the severity of OSMF the duration of chewing was irrelevant to the development of the disease.[19] In our study we noticed that OSMF developed predominantly in younger population with lesser duration of chewing habits hence emphasizing the inherent toxic nature of the Paan and other smokeless tobacco products. Similarly, Shah et al hypothesized that the burden of exposure of toxic products at a period affected the development of OSMF in these models. [20] The relationship between chewing habit duration and mouth opening in OSMF patients was studied using chi-square and they gave a significant relationship with increase in duration of chewing showed reduced mouth opening among OSMF patients (p=0.004).

On correlating clinical staging and histological grading, analysis with Chi square test was not significant with p>0.05 which is like a study by Syeda Arshiya Ara et al who also found no significant relationship between histological grading and functional staging in OSMF. While studies by Kiran et al and Pandya et al, found

significant relation between the staging and grading these differences in results can be attributed to factors such as site of OSMF, fibrosis at the time of staging, duration of disease at time of assessment and the differences in system of assessment used. [21]

Several "quality of life" questionnaires have been developed over the past, however to our knowledge there are no questionnaire to suit the Andaman population. Keeping this in mind we aimed at developing a standardized QOL questionnaire to fulfill all the domains of life.the KMO score was 0.86 which shows that the sample was adequate for factor analysis. Hence can be concluded that the present QOL is a multidimensional construct with many factors within it.

Apart from the QOL questionnaire even Habit control, Barriers to quit habit etc were taken into consideration (Table5).Around 69% of the study population were willing to quit the habit, Major barrier for quitting the habit was stress(39%) and dependence(23%). The study results would be a valuable piece of information for public health personnel to enlighten the population about the ill effects of the deleterious habit and about the dreadful disease that they would encounter.

Conclusion

The duration of tobacco chewing significantly affects the severity of mouth opening and in turn the levels of fibrosis in OSMF patients. However, the comparison of functional and histopathological lesions was of little use in our study and clinical indicators are a more reliable marker of the disease when compared to functional staging. This study is novel to the Andaman Islands and served as a potential tool to educate the natives on the tobacco consumption habits .Since our study concentrated on a smaller sample in one region of the Andaman Islands it needs to be expanded to cover more geographical and ethnic population to provide promising results in addressing the tobacco challenge in these regions.

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