

## Role Of Habitual Risk Factors On Oral Squamous Cell Carcinoma

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### Abstract:

*Squamous cell carcinoma is the most common oral malignancy. Betel quid, betel quid with tobacco, smoking, alcohol consumption, mechanical irritation, genetic are the most important risk factors for Oral Squamous Cell Carcinoma (OSCC). The aim of the study was to determine the role of habitual risk factors in Oral Squamous Cell Carcinoma.*

*Materials and Methods: This is a cross-sectional study for the determination of the risk factors of OSCC over 2 years period of January 2011 to December 2012. Department of Oral & Maxillofacial Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Department of Oral & Maxillofacial Surgery, Dhaka Dental College Hospital, Dhaka, National Institute of Cancer Research & Hospital (NICRH), Mohakhali, Dhaka and Health and Hope Hospital, Dhaka from January 2011 to December 2012*

*Results: 250 patients, comprising 44% male and 56% female were included in the study. Overall mean age was 55.94±10.93 years. The patients of OSCC have most common habit of betel quid with tobacco 124(49.6%), then betel quid with tobacco and smoking 49(19.6%), betel quid with tobacco and Gul 19(7.6%), only smoking 13(5.2%), Betel quid without tobacco and smoking 13(5.2%), betel quid without tobacco 12(5.2%), betel quid with tobacco and catechu (Khoir) 4(1.6%), betel quid with tobacco, smoking and gul 3(1.2%), betel quid without tobacco, smoking and alcohol 2(0.8%), betel quid without tobacco and gul 2(0.8%), betel quid without tobacco, smoking and gul 1(0.4%), betel nut chewing 1(0.4%), mechanical irritation but no habit 5(2.0%) and no habitual history 2(0.8%).*

*Conclusion: According to this study betel quid, betel quid with tobacco, gul, smoking are the important risk factors in OSCC.*

*Key words : Habitual risk factors, Oral Squamous Cell Carcinoma.(OSCC)*

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## Introduction

Oral squamous cell carcinoma (OSCC) is the most common malignant epithelial neoplasm affecting the oral cavity.<sup>1</sup> It is a major global health issue, with half a million new cases diagnosed per year.<sup>2</sup> In Bangladesh the number of new cancer cases per year is about two lacks of which oral cancer is about 20%.<sup>3</sup> The etiology of oral squamous cell carcinoma is complex and multifactorial. Chewing tobacco, smoking and alcohol consumption are the most strongly implicated risk factors for the development of oral squamous cell carcinoma. Other risk factors including chewing areca nut, chronic irritation, certain viruses, oral candidiasis, poor oral hygiene, exposure to industrial products, ionizing radiation, age, familial or genetic predisposition.<sup>4</sup>

The association between tobacco smoking and oral squamous cell carcinoma is well established. Oral use of smokeless tobacco is practiced worldwide in many forms.<sup>5</sup> The developing countries in Southeast Asia and Pacific Rim the habit of tobacco chewing is usually associated with the use of areca nut, which may have a synergistic effect on the development of cancerous and precancerous lesions.

A number of studies have characterized smokeless tobacco as an etiological factor in the development of cancer of the oral cavity and the esophagus.<sup>5-6</sup> In the West, there are three basic types of smokeless tobacco commonly used in the oral cavity dry air cured tobacco, which is shredded into flakes and treated with flavoring solutions; moist snuff, which consists of air and fire cured dark tobacco that is finely cut and fermented and dry snuff, which is fire-cured and pulverized into powder. All of these products are placed in contact with the oral mucosa, usually between the cheek and gum. Moist snuff and chewing tobacco are used primarily by men, whereas dry snuff is used more often by women.<sup>7,8</sup>

Usually in this sub-continent the betel quid is known as paan which is a package formed from the leaf of the Piper betel plant. Paan is made by adding ingredients including slices of areca nut, slaked lime (calcium hydroxide), tobacco, spices and a variety of other ingredients depending on availability, geographical location, and ceremonial occasion. The package is folded into a triangular quid and chewed, sometimes even swallowed. The slaked lime is used to increase the pH of the oral cavity, aiding absorption of nicotine

by the oral mucosa.<sup>9</sup>

There is an independent effect of paan without tobacco in the causation of oral cancer. Its findings may be of significance in south Asian communities where paan is used. People with oral sub mucous fibrosis were 19.1 times more likely to develop oral cancer than those without it, after adjusting for other risk factors. People using paan without tobacco were 9.9 times, those using paan with tobacco 8.4 times, more likely to develop oral cancer as compared with non-users, after adjustment for other covariates.<sup>10</sup> Oral squamous cell carcinoma has one of the highest recorded incidence in developing countries, comprising 20-30% of all neoplasms.<sup>11</sup>

Many studies were carried out about the risk factors of OSCC but most of them were done with one or two risk factors. Among them betel quid chewing, tobacco chewing, smoking and alcohol are considered as highest risk factor. In Bangladesh many people are habituated with multiple risk factors of OSCC and many are habituated with single risk factor. At present OSCC as a major health issue of Bangladesh among other malignancy and identification of risk factors for these OSCC affected people is a major time demand. The objectives of this study was to assess the relation of habitual risk factors on oral squamous cell carcinoma, to identify the frequency of oral squamous cell carcinoma in tertiary hospital and its association with multifactorial habitual risk factors. This study was designed to find out the habitual risk factors associated with oral squamous cell carcinoma among Bangladeshi people.

## Materials & Methods

This is a randomized cross-sectional study. Department of Oral & Maxillofacial Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Department of Oral & Maxillofacial Surgery, Dhaka Dental College Hospital, Dhaka, National Institute of Cancer Research & Hospital (NICRH), Mohakhali, Dhaka and Health and Hope Hospital, Dhaka from January 2011 to December 2012. All the patients who were diagnosed as oral squamous cell carcinoma irrespective of age and sex, fulfilling the basic requirements of inclusion and exclusion criteria were included in this study. Total number of patients were 250 (Two hundred and fifty).

Inclusion criteria washistopathologically diagnosed

patients with oral squamous cell carcinoma, those who gave consent to be included in the study. Exclusion criteria was patient suffering from another type of malignancy, recurrent oral squamous cell carcinoma patients, Psychotic patient, Patient with inadequate information.

**Ethical Consideration**

The research protocol was approved by concerns of the department. The aims and objectives of the study along with its procedure, alternative diagnostic methods, risk and benefit of the study was explained to the patients in easily understandable local language and then informed consent was taken from the patients. It was assured that all information and records would be kept confidential and the procedure would be helpful for both attending surgeon and patients in making decision for management.

**Study Procedure**

At first informed written consent was taken from the patients those made the requirements of both inclusion and exclusion criteria. The following a pre-developed standardized questionnaire / history sheet they were interrogated age, sex, habits (tobacco, alcohol consumption, paan, betel, smokeless tobacco, gul), occupation, medical records and familial antecedents of neoplasm. Then following the ideal protocol of examination all the patients were examined who identify the size, site, and duration, fixity with overlying skin or underlying structure and presence of pain. Collected data were posted in data sheet.

Regarding habit of the patients, the risk factors were evaluated individually. For tobacco use regular users with at least > 10 sticks/day for at least one year was considered as risk factors for betel quid with tobacco at least 7 leaf/day for one year was considered as risk factors. Regarding gul, catechu (khair), those also used at least once in a day at any amount was considered as risk factors. All these data was analyzed with statistical software (SPSS version 16). Frequency and percentage was calculated for categorical variables and mean and standard deviation for continuous variables.

**Results And Observations**

Table-I: Age distribution of the patients (n=250)

Age (in years)	Frequency	Percentage (%)	Mean±SD
20-30 years	2	0.80	27.50±3.53
31-40 years	21	8.4	38.14±2.43
41-50 years	78	31.2	47.89±2.36
51-60 years	80	32.0	57.43±2.62
61-70 years	52	20.8	66.73±2.72
71-80 years	14	5.6	76.21±2.42
> 80 years	3	1.25	87.00±2.64
Total	250	100.0	55.94±10.93
Range	(25-90) years		

Most of the patients in this study were 6th decade (32.0%) and then 5th decade (31.2%) and then 7th decade (20.8%), 4th decade (8.4%) and then above 8th decade (5.6%) and least 3rd decade (0.80%). Mean age of the patients was 55.94±10.93 (Table-I).

Fig. 1: Figure shows sex distribution of the patients (n=250)

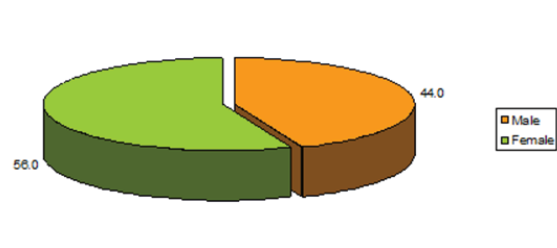


Figure shows female are more affected than male and male:female ratio was 1 : 1.27.

Table-II: Distribution of the patients according to habitual history (n=250)

Habitual factor	No of patients	Percentage (%)
Betel quid with tobacco	124	49.6
Betel quid with tobacco+ Smoking	49	19.6
Betel quid with tobacco+ Gul	19	7.6
Smoking only	13	5.2
Betel quid without tobacco+ Smoking	13	5.2
Betel quid without tobacco	12	4.8
Betel quid with tobacco + Catechu (Khoir)	4	1.6

Betel quid with tobacco+ Smoking +Gul	3	1.2
Betel quid without tobacco +Smoking + Alcohol	2	0.8
Betel quid without tobacco+ Gul	2	0.8
Betel quid without tobacco+ Smoking + Gul	1	0.4
Betel nut chewing	1	0.4
Mechanical irritation but no habit	5	2.0
No habitual history	2	0.8
Total	250	100.0

Table-II shows the patients of OSCC have the most common habit of betel quid with tobacco 124(49.6%) and then betel quid with tobacco and smoking 49(19.6%). Betel quid with tobacco + Gul 19(7.6%), only smoking 13(5.2%), Betel quid without tobacco+ Smoking 13(5.2%), Betel quid without tobacco 12(5.2%), Betel quid with tobacco + catechu (Khoir) 4(1.6%), Betel quid with tobacco+ Smoking +Gul 3(1.2%), Betel quid without tobacco +Smoking + Alcohol 2(0.8%), Betel quid without tobacco+ Gul 2(0.8%), Betel quid without tobacco+ Smoking + Gul 1(0.4%), Betel nut chewing 1(0.4%), Mechanical irritation but no habit 5(2.0%) and No habitual history 2(0.8%).

Table-III: Distribution of the patients according to habit of betel quid and other than betel quid (n=250)

Habitualfactor	No of patients	Percentage (%)
Betelquid only	12	4.8
Betel quid with other habits (tobacco, smoking, gul, catechu (khoir), alcohol etc.)	217	86.8
Smokingonly	13	5.2
Mechanical irritation but no habit	5	2.0
Betelnut chewing	1	0.4
No habitualhistory	2	0.8
Total	250	100.0

Table-III shows that the patients of OSCC have the habit of taking betel quid alone 12(4.8%) and betel quid in association with other habits 217(86.8%). So, betel quid alone or in association with other habits

like tobacco, smoking, gul, catechu (khoir), alcohol etc together was 229(91.6%). The habit of smoking only 13(5.2%). There was 5 patients who have no significant habitual risk factors but presence of mechanical irritation only. 1 patient also had betel nut chewing habit. There was 2 patients who had neither any habitual risk factors nor any mechanical irritation. Table-IV: Distribution of the patients with betel quid by duration (years) (n=229)

Duration (years)	No of patients	Percentage (%)
≤10	20	8.73
11-20	47	20.52
21-30	64	27.95
31-40	62	27.07
> 40	36	15.72
Total	229	100.0
Mean±SD	27.34±12.65	

The majority 126(55.02%) of the patients of OSCC duration of habits was 21-40 years and then 47(20.52%) of the patients duration of habits was 11-20 years. 36(15.7%) duration of habit > 40 years and least 20(8.73%) patients were duration of habit < 10 years (Table-IV).

Table-V: Distribution of the patients according to habit by quantity (per day) (n=243)

Habit	Patient's distribution (No. %)				Total
	according to quantity /day				
	< 10	10-20	21-30	> 30	
Betel quid with tobacco	7(5.6%)	26(21.0%)	32(25.8%)	59(47.6%)	124(100.0%)
Betel quid with tobacco+ Smoking	4(8.2%)	21(42.9%)	12(24.5%)	12(24.5%)	49(100.0%)
Betel quid with tobacco+ Gul	3(15.8%)	7(36.8%)	7(36.8%)	2(10.5%)	19(100.0%)
Only smoking	0	2(15.4%)	3(23.1%)	8(61.5%)	13(100.0%)
Betel quid without tobacco+ Smoking	3(23.1%)	4(30.8%)	6(46.2%)	0	13(100.0%)
Betel quid without tobacco	1(8.3%)	2(16.7%)	5(41.7%)	4(33.3%)	12(100.0%)
Betel quid with tobacco+ Catechu (Khoir)	0	1(25.0%)	3(75.0%)	0	4(100.0%)

Betel quid with tobacco+Smoking+Gul	2(66.7%)	1(33.3%)	0	0	3(100.0%)
Betel quid without tobacco+Smoking +Alcohol	0	2(100.0%)	0	0	2(100.0%)
Betel quid without tobacco+Gul	1(50.0%)	1(50.0%)	0	0	2(100.0%)
Betel quid without tobacco+Smoking + Gul	1(100.0%)	0	0	0	1(100.0%)
Betel nut chewing	0	0	0	1(100.0%)	1(100.0%)
Total	22	67	68	86	243

Table-V shows, the patients of OSCC with the habit of Betel quid with tobacco 59(47.6%) frequency per day more > 30, 32(25.8%) frequency per day 21-30. 26(21.0%) frequency per day 10-20, 7(5.6%) frequency per day < 10. With the habit of betel quid with tobacco+ Smoking 21(42.9%) frequency per day 10-20, 12(24.5%) frequency per day 21-30 or > 30, 3(15.8%) frequency per day < 10. With the habit of betel quid with tobacco+ Gul 7(36.8%) frequency per day 10-20 or 21-30, 3(15.8%) frequency per day < 10, 2(10.5%) frequency per day > 30. With habit of only smoking 8(61.5%) frequency per day > 30, 3(23.1%) frequency per day 21-30, 2(15.4%) frequency per day 10-20. With the habit of betel quid without tobacco+Smoking 6(46.2%) frequency per day 21-30, 4(30.8%) frequency per day 10-20, 3(23.1%) frequency per day <10. With the habit of betel quid without tobacco 5(41.7%) frequency per day 21-30, 4(33.3%) frequency per day > 30, 1(8.3%) frequency per day < 10. With the habit of betel quid with tobacco+ Catechu (Khoir) 3(75.0%) frequency per day 21-30, 1(25.0%) frequency per day 10-20. With the habit of betel quid with tobacco+ Smoking+Gul 2(66.7%) frequency per day <10, 1(33.33%) frequency per day 10-20. With the habit of betel quid without tobacco+Smoking + Alcohol 2(100.0%) frequency per day 10-20. With the habit of betel quid without tobacco+Gul 1(50.0%) frequency per day < 10 or 10-20. With the habit of betel quid without tobacco+Smoking + Gul 1(100.0%) frequency per day <10 and with the habit of betel nut chewing 1(100.0%) frequency per day > 30.

Table-VI: Habitual distribution according to sex by quantity (per day) (n=243)

Habit	Sex				Total	
	Male		Female			
	No	%	No	%	No	%
Betel quid with tobacco	26	10.70%	98	40.3%	124	51.03%
Betel quid with tobacco+Smoking	46	18.93%	3	1.23%	49	20.16%
Betel quid with tobacco+ Gul	0	0%	19	7.82%	19	7.82%
Only smoking	13	5.35%	0	0.00%	13	5.35%
Betel quid without tobacco+Smoking	11	4.53%	2	0.82%	13	5.35%
Betel quid without tobacco	3	1.23%	9	3.70%	12	4.94%
Betel quid with tobacco+ Catechu (Khoir)	2	0.82%	2	0.82%	4	1.65%
Betel quid with tobacco+Smoking+Gul	3	1.23%	0	0.00%	3	1.23%
Betel quid without tobacco+Smoking + Alcohol	2	0.82%	0	0.00%	2	0.82%
Betel quid without tobacco+Gul	2	0.82%	0	0.00%	2	0.82%
Betel quid without tobacco+Smoking + Gul	1	0.41%	0	0.00%	1	0.41%
Betel nut chewing	0	0%	1	0.41%	1	0.41%

Table-VI shows, the patients of OSCC with the habit of Betel quid with tobacco 26(10.70%) male and 98(40.3%) female, betel quid with tobacco and smoking 46(18.93%) male and 3(1.23%) female. Only smoking 13(5.35%) male and no female.

**Discussion**

Oral cancer is a major and growing worldwide problem. Its incidence, etiology and natural history vary considerably in different population groups. Variation in incidence is related to exposure to known etiological factors such as tobacco and betel nut chewing, smoking and alcohol consumption.<sup>12</sup>

In Bangladesh where betel quid chewing with tobacco is common practice among the people and many people have betel quid chewing with tobacco and smoking habit. Certainly the major risk factors of oral squamous cell carcinoma different from those of



western world.

The present study showed (Table-II) that as a single factor betel quid chewing with tobacco is a major risk factors of oral squamous cell carcinoma in Bangladesh, but it is not possible find out which one is the main contributory factor to develop OSCC. In the present series of 250 patients, 124(49.6%) were habituated with betel quid with tobacco and 49(19.6%) were habituated with betel quid with tobacco plus smoking. A study in Southern India smoking and betel quid with tobacco were major independent risk factors of OSC. <sup>13</sup> Tarin showed that in Bangladesh 75.6% were habituated with betel quid chewing with tobacco. <sup>14</sup>

In the presented study (Table-III) showed that betel quid alone or in association with other habits {tobacco, smoking, gul, catechu (khour), alcohol etc together was 229 (91.6%) which supported by epidemiological study of Chiba done in this subcontinent which reported betel chewing is the main etiological factor of OSCC in India, Pakistan & Srilanka. <sup>11</sup> The patients of OSCC with the habit of Betel quid with tobacco 26(10.70%) male and 98(40.3%) female, betel quid with tobacco and smoking 46(18.93%) male and 3(1.23%) female. Only smoking 13(5.35%) male and no female (Table-VI).

But it is completely different from the western world study which estimated the percentage of oral cancers attributable to cigarette smoking have been quite consistent, generally ranging from 75% to 90%. <sup>15</sup> Only two patients of the presented study were found habituated with alcohol consumption which completely differs from the western world, which showed most patients of OSCC drink alcohol. This difference of habit may be due to social and religious barrier. The study of Winn found rate of alcohol consumption as high as 94% in men and 82% in woman. <sup>16</sup> Another study showed that total alcohol intake was significantly associated with risk of OSCC. Heavy alcohol drinker (25 or more Oz / month) had a relative risk compared with non-drinkers.

An effect of alcoholic beverages was found in subjects with an averages daily consumption of 120 or more grams of alcohol, with a higher risk in beer drinkers. Among heavy consumers of alcohol and tobacco, risk of oral cancer was very high. Merletti showed a positive association between oral cancer and low educational level, after adjustments of

alcohol and tobacco was found. <sup>17</sup> But a study carried out in our country showed similar result to this study. <sup>14</sup> In this study most common site was buccal mucosa 38.8% with the habit of betel quid with tobacco and 2nd habit was betel quid with tobacco and smoking (14%). A study showed that more common site was buccal mucosa. <sup>18</sup> Another study also showed that the most common site of OSCC was the buccal mucosa. <sup>10</sup> With the habit of smoking the common sites was buccal mucosa 3.2% and then tongue about 1.6%. In this study only one patient (0.4%) was habituated with betel nut chewing. It is largely different from a study in South African Indian which showed 23% were habituated with betel nut chewing. <sup>18</sup> Most of the patients in this study were (TNM staging) stage III 197(78.8%) and then stage IV 35 (14.0%), then stage II 15 (6.0%) and least stage I 3 (1.2%) patients.

In this study age distribution was very widely, from 2nd to 8th and more of the 8th decade of life but most commonly found in 5th & 6th decade. Mean age of OSCC in this study  $55.94 \pm 10.93$  years. This result is similar to studies carried out in our country which reported the incidence of OSCC was more in 6th decade. <sup>14</sup> But different from western study which reported the incidence of OSCC in higher age group, which was in 7th decade. <sup>19</sup> In this study the lowest age was 25 years, only 1 patient who was habituated with betel nut chewing for 3 to 4 years. She was first affected from oral sub mucus fibrosis, which turned into oral squamous cell carcinoma.

In this study female was more affected than male. Male: female ratio was 1:1.27. It is more or less similar to a study in South African Indian where male female ratio was 1:1.6 and study of Park et al. showed male female ratio was 2:1 which was different from the present study. <sup>18, 20</sup>

### Conclusion

According to this study, betel quid alone or in association with other habits like tobacco, smoking, gul, catechu (khour), alcohol were observed the main risk factors, among them betel quid with tobacco was observed as the most significant risk factors in this study. Oral squamous cell carcinoma has a multifactorial risk factors such as betel quid, betel quid with tobacco, gul, smoking, alcohol etc. It depends on frequency and duration of the risk factors. Overall a

large scale study with more information from conscious people can be done for better analysis and result.

For accurate information from the OSCC patients, data should be collected from literate person and overcome social and religious problem comparison to random sampling.

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