Original Research Paper

Dentistry

ADDICTION HABIT AND BIOCHEMICAL MARKERS IN ORAL SQUAMOUS CELL CARCINOMA

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ABSTRACT **Background:** Oral cancer presents challenging and unresolved problems for the human population, and for a high-risk region like India it is of prime concern. In India, where the habits of chewing tobacco with betel nut, reverse smoking and heavy alcohol usage are common, there is a striking incidence of oral cancer, which accounts for as many as 30-40% of all cancers. About 90% of oral cancers are squamous cell carcinomas (OSCCs).2 Considering the ever increasing incidence of OSCC in India and worldwide, there is always a need to find out and standardize easier methods for screening, diagnostic as well as therapeutic purposes. In this view, the biochemical studies could prove to be promising in the future. Biochemical studies in the evaluation of cancer have shown that various substances alter quantitatively in the serum during tumor development.3
Setting And Design: Tertiary care hospital, Observational Case control Study
Conclusion: The habit of tobacco chewing was significantly (p=0.006) higher among the cases (90%) compared to controls (50%). There was no significant (p>0.05) difference in the habit of smoking and alcohol intake between cases and controls. In present study the correlation of among biochemical parameters in the cases. Only SGPT and SGOT was found to be positively significantly correlated (r=0.82, p=0.0001) among the cases.

KEYWORDS :

INTRODUCTION

Oral cancer presents challenging and unresolved problems for the human population, and for a high-risk region like India it is of prime concern. It constitutes about 3-4% of all cancers in western industrialized countries, mainly affects middle aged and elderly people; and is more common in men compared to women.[1]

In India, where the habits of chewing tobacco with betel nut, reverse smoking and heavy alcohol usage are common, there is a striking incidence of oral cancer, which accounts for as many as 30-40% of all cancers. About 90% of oral cancers are squamous cell carcinomas (OSCCs).[2]

Considering the ever increasing incidence of OSCC in India and worldwide, there is always a need to find out and standardize easier methods for screening, diagnostic as well as therapeutic purposes. In this view, the biochemical studies could prove to be promising in the future. Biochemical studies in the evaluation of cancer have shown that various substances alter quantitatively in the serum during tumor development.[3]

In order to be clinically useful, such biochemical substances must be associated with tumor cells and must be present in appreciable quantity in tissue or fluid; where their concentration can be related to underlying tumor burden.

Estimation of such parameters might permit selection of the most appropriate treatment for the individual patient. Among all the body fluids, blood has been the media of choice for the study of the biochemical markers to the medical community.[4]

MATERIALS AND METHODOLOGY
Sources Of Data :
Patients were categorized into two groups :

1) Study Group:
60 patients histopathologically confirmed as oral squamous cell carcinoma were selected from the outpatient clinic of department of Oral Medicine and Radiology, Dr. B R Ambedkar Institute of Dental Sciences and Hospital, Mahavir Cancer Sansthan and All India Institute of Medical Sciences,

Patna, Bihar in the study group.

2) Control Group:
10 healthy volunteers with age and sex matched with the study group visiting the outpatient clinic of department of Oral Medicine and Radiology, Dr. B R Ambedkar Institute of Dental Sciences and Hospital, and All India Institute of Medical Sciences, Patna, Bihar for routine dental checkup were included in the control group.

METHODOLOGY :
Clinical Inclusion Criteria:
Control Group :
• Age ,sex and risk factors will be same
• Subjects within the age range of 20-60 yrs,both male and females
• With habit of chewing tobacco in any form
• Group I - 10 Subjects without any lesions

Study Group :
• Subjects within the age range of 20-60 yrs,both male and females
• With habit of chewing tabacco in any form
• Group II - 60 histopathologically confirmed cases of OSCC.

Clinical Exclusion Criteria:
Control Group :
• Systemic diseases known to increase serum LDH, SGOT, SGPT, Alkaline phosphatase and RBS levels such as MI, liver diseases ,renal disease, and muscle dystrophy.
• Other oral conditions known to increase serum biomarkers like periodontitis and patients having received dental treatment 48 hours prior to the study .

Study Group:
• Patients treated for cancers (chemotherapy, radiotherapy)
• Systemic diseases known to increase serum biomarker levels such as MI, liver diseases ,renal disease, and muscle dystrophy
• Other oral conditions known to increase serum biomarker levels like periodontitis and patients having received dental treatment 48 hours prior to the study .

Study Method
Clinical Examination :
Material Used In Clinical Examination
1. Conventional dental chair with illumination
2. A pair of sterile gloves, disposable mouth mask
3. 2 plain mouth mirrors (No.5), straight probe, tweezers
4. Gauze piece and cotton
5. Glass tumbler with water

A brief case history was recorded and if clinical findings matched with inclusion criteria, the patient was informed about all the procedures to be performed during the study. Following that, if patient was ready to be a part of study, the patient was asked to sign the consent form.

Photo 1: Armamentarium Used For Clinical Examination

All the aseptic measures were taken and tourniquet was applied 2 inches above the elbow on the upper arm. The site of puncture was cleaned using sterile gauze dipped in surgical spirit. Using 5ml syringe with a 22 gauge 1 ½ inches needle, 4ml of blood was drawn from the antecubital vein. The blood was allowed to clot and the serum separated by centrifugation. The collected serum was stored at -20∘C until use.

Statistical Analysis
The results are presented in mean±SD and percentages. The Chi-square test was used to compare the categorical variables. The Unpaired t-test was used to compare continuous variables between the groups. The Paired t-test was used to compare the change in the serum LDH from pre-op to post-op among the cases. The one way analysis of variance was used to compare the biochemical parameters among the clinical stages in cases and histopathological grades. The Pearson correlation coefficient was calculated to find the direction of correlation between biochemical parameters and age as well as among the biochemical parameters in the cases. The p-value<0.05 was considered significant. All the analysis was carried out on SPSS 16.0 version (Chicago, Inc., USA).

RESULTS
The present study was conducted in the Department of Oral Medicine and Maxillofacial Radiology, A total of 60 cases and 10 controls were included in the study.

Table-1: Age Distribution Between Cases And Controls

Age in years	Cases (n=60)		Controls (n=10)		p-value[1]
	No.	%	No.	%	
<30	2	3.3	1	10.0	0.76
30-40	15	25.0	2	20.0	
41-50	15	25.0	3	30.0	
>50	28	46.7	4	40.0	
Mean±SD	48.45±11.72		45.30±13.23		

Chi-square test

Table-1 & Fig. 1 shows the age distribution between cases and controls. More than one third of the cases (46.7%) and controls (40%) were above 50 years. The mean age of the cases and controls was 48.45 (±11.72) and 45.30 (±13.23) years respectively. There was no significant (p>0.05) difference in the age between cases and controls showing comparability of the groups in terms of age.
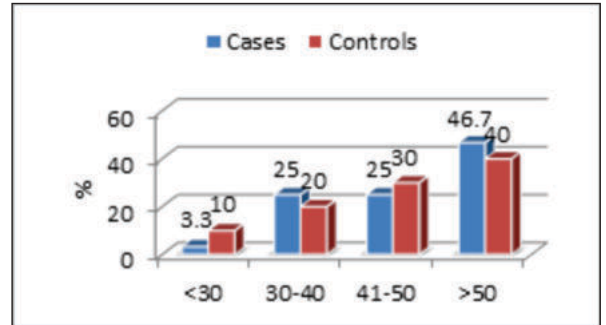
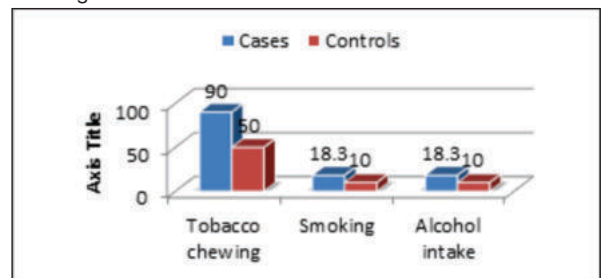**Fig. 1:** Age Distribution Between Cases And Controls

Majority of the both cases (75%) and controls (70%) were males. There was no significant (p>0.05) difference in the gender between cases and controls showing comparability of the groups in terms of gender.

Table-2: Distribution Of Addiction Habit Between Cases And Controls

| Addiction habit	Cases (n=60)		Controls (n=10)		p-value[1]
	No.	%	No.	%	
Tobacco chewing	54	90.0	5	50.0	0.006*
Smoking	11	18.3	1	10.0	0.51
Alcohol intake	11	18.3	1	10.0	0.51

[1]Chi-square test, *Significant

Table-2 & Fig. 2 shows the distribution of addiction habit between cases and controls. The habit of tobacco chewing was significantly (p=0.006) higher among the cases (90%) compared to controls (50%). There was no significant (p>0.05) difference in the habit of smoking and alcohol intake between cases and controls.

Fig. 2: Distribution Of Addiction Between Cases And Controls

Table-3: Distribution Of Biochemical Parameters Among The Cases

| Biochemical parameters	No. (n=60)
Alkaline phosphate (μ/l)	264.31±137.69
SGOT (μ/l)	34.74±14.16
SGPT (μ/l)	42.07±19.32
RBS (mg%)	92.50±19.49
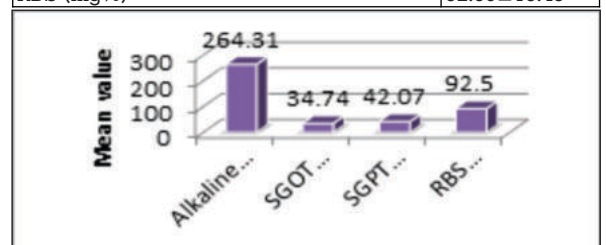
Fig. 3: Distribution Of Biochemical Parameters Among The Cases

Table-3 & Fig. 3 shows the distribution of biochemical parameters among the cases. Alkaline phosphate (μ/l) was 264.31 (±137.69). The SGOT and SGPT were found to be 34.74 (±14.16) and 42.07 (±19.32) among the cases. However, RBS was observed to be 92.50 (±19.49) among the cases.

Table-4: Correlation Among The Biochemical Parameters In Cases

		Pre OP level of Serum LDH	Alkaline phosphatase	SGOT	SGPT	RBS
Pre OP level of Serum LDH (u/l)	r	1				
	p-value					
Alkaline phosphatase (u/l)	r	0.16	1			
	p-value	0.21				
SGOT (u/l)	r	0.15	-0.06	1		
	p-value	0.23	0.65			
SGPT (u/l)	r	0.17	0.02	0.82**	1	
	p-value	0.18	0.84	0.0001		
RBS (mg%)	r	0.12	0.33*	0.05	0.17	1
	p-value	0.36	0.01	0.66	0.18	

r: Correlation coefficient, *. Correlation is significant at the 0.05 level (2-tailed), **. Correlation is significant at the 0.01 level (2-tailed).

Table-4 shows the correlation of among biochemical parameters in the cases. Only SGPT and SGOT (Fig. 4) was found to be positively significantly correlated (r=0.82, p=0.0001) among the cases.
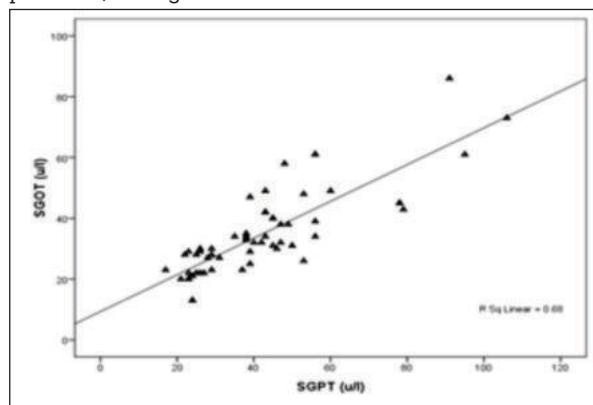
Fig. 4: Scatter Diagram Showing Correlation Between SGOT And SGPT Among The Cases

DISCUSSION
In the present study, a total of 70 subjects including 60 cases and 10 controls were assessed for serum LDH level, and a detailed clinical examination and relevant history of each patient came to the outpatient clinic of Mahavir Cancer Sansthan and All India Institute of Medical Sciences, Patna, Bihar in the study group were recorded thoroughly. The present study was thus carried out to evaluate the serum levels of LDH in patients with OSCC subjects independently and patients came to the OPD for routine checkup, and to probe the possible interrelationships among them so as to utilize this biochemical measurement as an adjunct or alone to diagnose malignant conditions well, before they are clinically or histologically apparent and to monitor the progress of the disease at every step and the prognosis of the disease.

Age And Gender Distribution
In present study the age distribution between cases and controls. More than one third of the cases (46.7%) and controls (40%) were above 50 years. The mean age of the cases and controls was 48.45 (±11.72) and 45.30 (±13.23) years respectively.

The gender distribution between cases and controls. Majority of the both cases (75%) and controls (70%) were males. [5] **S. Warnakulasuriya**, Oral SCC more frequently affects men than women (M:F = 1.5:1) most probably because more men than women indulge in high-risk habits.

The probability of developing oral SCC increases with the period of exposure to risk factors, and increasing age adds the further dimension of age-related mutagenic and epigenetic changes. In the USA the median age of diagnosis of oral SCC is 62 years. However, the incidence of oral SCC in persons under the age of 45 is increasing.

Addiction Habit
In present study the distribution of addiction habit between cases and controls, The habit of tobacco chewing was significantly (p=0.006) higher among the cases (90%) compared to controls (50%). There was no significant (p>0.05) difference in the habit of smoking and alcohol intake between cases and controls.

[6] **Shafer WG, Hine MK, Levy BM** , Etiological factors in oral cancers are smoked and smokeless tobacco, alcohol, diet and nutrition, viruses, immunosuppression and chronic infection.

[7] **J. P. Shah and Z. Gil, S. Petti,** The most important risk factors for oral SCC are use of tobacco or betel quid and the regular drinking of alcoholic beverages.

Brown RL, Suh JM, Scarborough JE, et al. Snuff and chewing tobacco have also been associated with an increased risk for oral cancer.

Bouquot JE, Meckstroth RL. Oral cancer in a tobacco-chewing U.S. population –A significant number of oral cancers in smokeless tobacco users develop at the site of tobacco placement. However, the use of smokeless tobacco appears to be associated with a much lower cancer risk than that associated with smoked tobacco. This association was in contrast to the findings in our present study.

Distribution Of Biochemical Parameters Among Cases
In present study the distribution of biochemical parameters among the cases. Alkaline phosphate (μ/l) was 264.31 (±137.69). The SGOT and SGPT were found to be 34.74 (±14.16) and 42.07 (±19.32) among the cases. However, RBS was observed to be 92.50 (±19.49) among the cases.

Correlation Among The Biochemical Parameters In Cases
In present study the correlation of among biochemical parameters in the cases. Only SGPT and SGOT was found to be positively significantly correlated (r=0.82, p=0.0001) among the cases.

Correlation Of Biochemical Parameters With Tobacco Chewing Among Cases
In present study there was positive co relation of serum LDH with habit of tobacco chewing as pre-op serum LDH was raised in tobacco chewers than non tobacco chewers, however, it was statistically not significant. there was no significant (p>0.05) in the biochemical parameters between tobacco chewers and non-chewers among the cases.

Correlation Of Biochemical Parameters With Smoking Among Cases
In present study there was no positive co relation of serum LDH and smokers, as it was raised in non-smokers compared to smokers, and the statistical data suggests no significant (p>0.05) in the biochemical parameters between smoker and non-smoker among the cases

Correlation Of Biochemical Parameters With Alcohol Intake Among Cases
In present study there was no positive co relation of serum LDH

and alcoholics as it was raised in non alcoholics, and the other biochemical parameters like alkaline phosphatase, SGPT, SGOT, RBS was not raised and the statistical data suggests no significant (p>0.05) in the biochemical parameters between alcoholic and non-alcoholic among the cases.

CONCLUSION

Based on the observation of our study to assess the relationship of addiction habit and Biochemical markers in squamous cell carcinoma of oral cavity, the following conclusions can be drawn:

1. The habit of tobacco chewing was significantly higher among the cases (90%) compared to controls (50%). There was no significant difference in the habit of smoking and alcohol intake between cases and controls.
2. The serum LDH level was significantly (p=0.001) higher among the cases compared to controls at pre-op.
3. There was significant rise in biochemical parameters among the cases, Alkaline phosphate (μ/l) was 264.31 ($\pm$137.69). The SGOT and SGPT were found to be 34.74 ($\pm$14.16) and 42.07 ($\pm$19.32) among the cases. However, RBS was observed to be 92.50 ($\pm$19.49) among the cases.
4. There was significant rise in serum LDH level, was 568.48$\pm$221.40 at pre-op which decreased to 530.71$\pm$255.81 at post-op. The mean change (37.77$\pm$358.90) in the serum LDH from pre-op to post-op was statistically insignificant.
5. There was poor correlation of biochemical parameters with age among the cases.
6. There was positive co relation of serum LDH with gender, as it was raised in males compared with females, however, other biochemical parameters like SGPT, SGOT and RBS was also raised in males compared with females, however, statistically no significant difference in the biochemical parameters between male and female among the cases.
7. There was no correlation of biochemical parameters among the cases, Only SGPT and SGOT was found to be positively significantly correlated among the cases.
8. There was positive co relation of serum LDH and tobacco chewers, as serum LDH level was raised in tobacco chewers compared to non tobacco chewers, however, it was statistically not significant. There was no significant difference in the biochemical parameters between tobacco chewers and non-chewers among the cases.
9. There was no significant difference in the biochemical parameters between smoker and non-smoker among the cases.
10. There was no significant difference in the biochemical parameters between alcoholic and non-alcoholic among the cases.

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