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### RESEARCH ARTICLE

## PREVALENCE OF ORAL CANCER IN PERSONS WITH ALCOHOL ABUSE AND ITS CORRELATION WITH SERUM AMINOTRANSFERASE LEVELS – A CASE CONTROL STUDY.

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Alcoholism, Mouth Neoplasms,  
Transaminases.

### Abstract

**Background:** Alcohol abuse is a major risk factor for various types of cancer, but strongest associations have been found for oral and pharyngeal cancers. Although the influence of alcohol on liver function has been extensively studied, studies correlating the liver function tests with prevalence of oral cancer are limited.

**Aims and Objectives:** The aim of our study was to assess the effect of alcohol in clinicopathogenesis of oral cancer, to test its synergism with tobacco use and to correlate this with serum aminotransferase levels.

**Materials and Methods:** A total of fifty patients with tobacco habit were equally divided into two groups: alcoholics with tobacco habit as cases (Group I) and non – alcoholics with tobacco habit as controls (Group II). A thorough intraoral examination was performed and histopathological grading for confirmation of oral cancer was done. Serum aminotransferases levels were assessed for all patients and the obtained results were analyzed statistically.

**Results:** Oral cancer was present in 84% of cases and 80% of controls and the result was not found to be statistically significant. Also, the relationship between levels of serum aminotransferases and occurrence of oral cancer in alcoholic patients was found to be statistically insignificant.

**Conclusion:** The combined deleterious habit of tobacco and alcohol increases the risk of oral cancer. The difference in prevalence of oral cancer in patients with and without alcohol habit was not found to be statistically significant. However, no correlation has been found between serum aminotransferase levels and prevalence of oral cancer in persons with alcohol abuse.

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### Introduction:-

Oral cancer is a common cancer of global concern. It is known to be a devastating disease of tremendous consequence to the individual, to family and to society. Known risk factors include alcohol consumption and tobacco, together responsible for about 75% of oral cancers in developed countries.<sup>1</sup> It has been difficult to

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distinguish the separate effects of these agents, however, since drinkers of alcoholic beverages tend to be smokers, and vice versa.<sup>2</sup> Oral cancer is related to these aetiological factors from qualitative as well as quantitative point of view. The consumption of alcohol is linked to the development of cancer due to combination of local toxic effects on the mucosa and systemic effects from the associated dietary deficiency, hepatic damage and possible alteration in patient's immunity.<sup>3</sup> Studies have shown that ethanol can increase the permeability of oral mucosa, resulting in epithelial tissue atrophy. Besides, alcohol is able to decompose the lipid composition of the outer epithelial membrane of mucosal tissue, which augments the susceptibility of oral mucosa to other carcinogens.<sup>4</sup> Liver function tests including estimation of serum aminotransferases (serum glutamic oxaloacetic transaminase and serum glutamic pyruvic transaminase) give objective information about alcohol consumption, changes in drinking habits and in decision making about the role of alcohol as an aetiological factor of disease.

Hence, a study has been planned to evaluate the effect of alcohol in the clinicopathogenesis of oral cancer and correlate these with the serum aminotransferase levels.

#### **Aims and objectives:**

- 1) To study the prevalence of oral cancer in persons with alcohol abuse.
- 2) To test the synergism of alcohol with tobacco use in oral cancer causation.
- 3) To correlate the prevalence of oral cancer in persons with alcohol abuse with serum aminotransferase levels.

#### **Materials and methods:-**

##### **1) Source of data:**

This case control study comprised of 50 patients visiting the Department of Psychiatry, BMCRI, Bangalore and Deaddiction Centre, Victoria Hospital, Bangalore.

The patients were selected on the basis of set inclusion and exclusion criteria and were further divided into two groups-

Group I- alcoholic patients with tobacco habit as cases- 25 patients

Group II- non-alcoholic patients with tobacco habit as controls- 25 patients

An ethical clearance from the institution and a written informed consent from the patients was taken prior to conductance of the study.

##### **2) Inclusion criteria:**

- a) Subjects with age group 21-79 years.
- b) Subjects with habit of tobacco use for more than one year.
- c) Histopathologically proven oral cancer patients.

##### **3) Exclusion criteria:**

- a) Subjects with habit history of less than one year of duration.
- b) Subjects who have undergone treatment for oral cancer.
- c) Subjects diagnosed with hepatitis, HIV and other systemic conditions affecting serum aminotransferase levels.

##### **4) Materials:**

- Sterilized Kidney tray
- Mouth mask
- Gloves
- Sterilized Mouth mirror
- Sterilized Straight probe
- Sterilized Metallic ruler
- Beckman Coulter AU analyzers

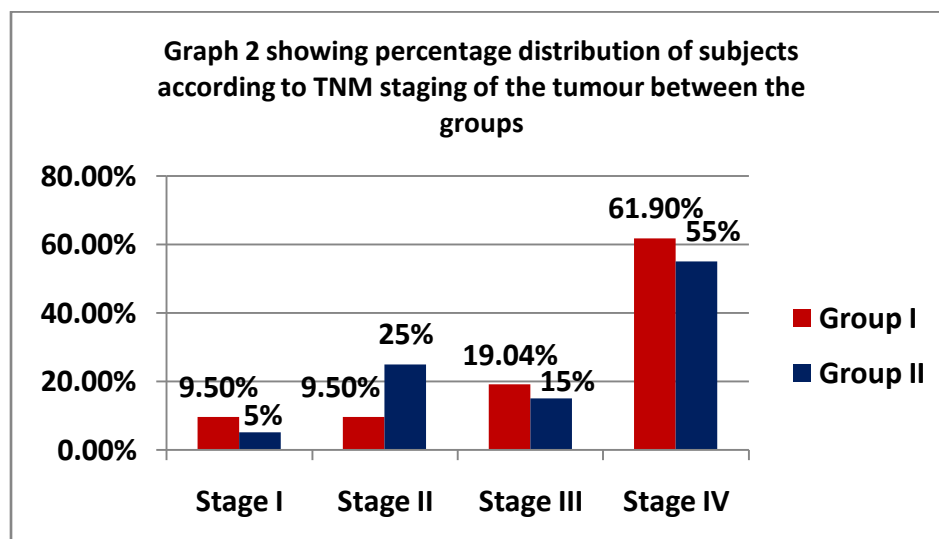
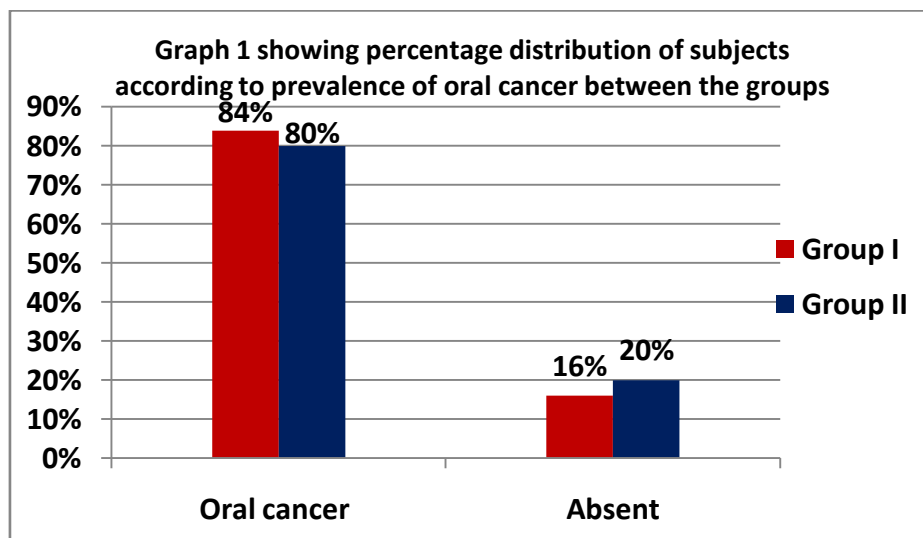
#### **Methodology:-**

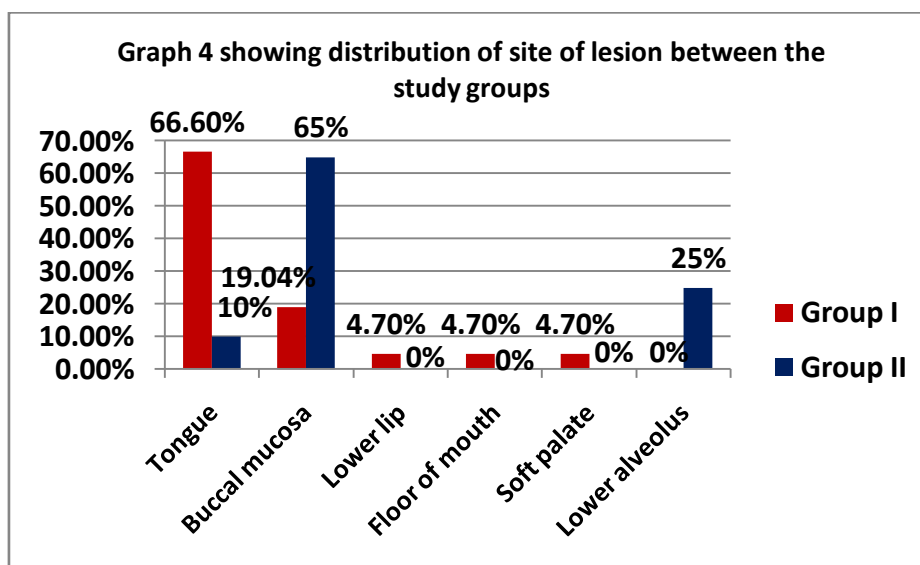
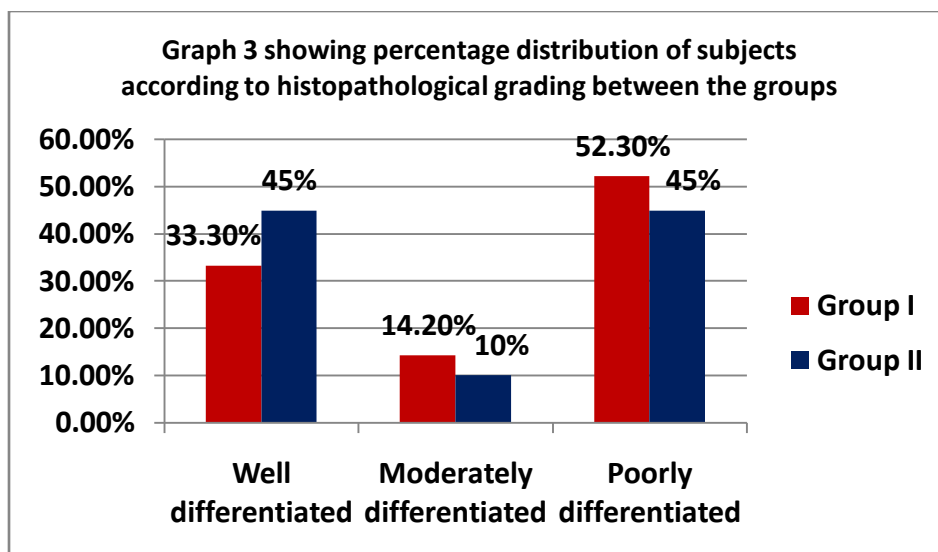
All the participants were informed about the objectives and purpose of the study and their willingness was sought before conductance of the study. History was recorded on a specially prepared case history proforma. Questionnaire data collected through in person interviews was used to assess consumption of alcohol, use of tobacco, usual adult diet, medical and dental history and demographic characteristics. Under a well illuminated light source, a thorough

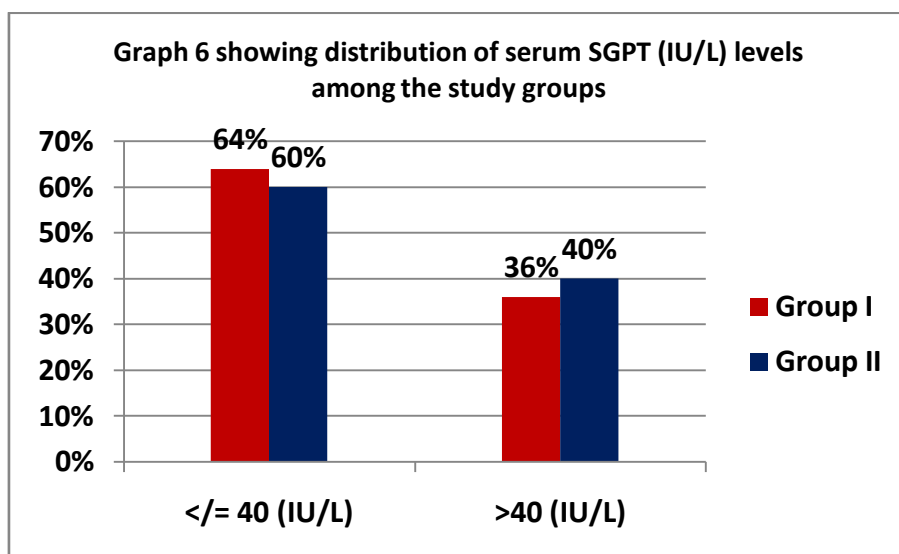
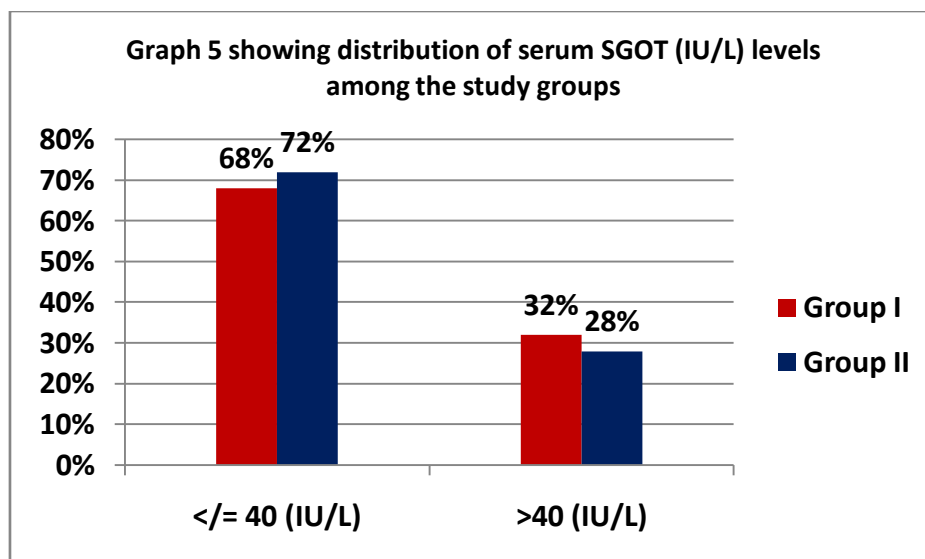
intraoral examination was performed with special emphasis on site, size, shape, margins and texture of the lesions. Histopathological grading for confirmation of oral cancer was done. The patients were further subjected to estimation of serum aminotransferase levels using Beckman Coulter AU analyzers. All measurements were performed by a single examiner to eliminate interexaminer variability. The collected data was subjected to statistical analysis.

### Results:-

In our study, maximum numbers of cases were found in 50-69 years age group (72%). The majority of patients in Group I were males (96%) whereas 60% of the patients in Group II were females. Oral cancer was present in 84% of patients in Group I and 80% of patients in Group II and the result was not found to be statistically significant [Graph1]. Majority of the patients in Group I had stage IV tumours i.e. 61.9% [Graph 2] and 52.3% had poorly differentiated tumours [Graph 3]. Tongue was the most common site of involvement in Group I patients (66.6%), whereas buccal mucosa was the most frequent site of involvement in Group II. Ventral surface of tongue was involved in 19.04% of patients in Group I [Graph 4]. In Group I, 32% patients had elevated SGOT levels as compared to 28% in Group II [Graph 5]. When comparing SGPT levels, 36% patients in Group I had elevated levels as compared to 40% in Group II and the result was not found to be statistically significant [Graph 6].







### Discussion:-

In this population based case control study, we have found the occurrence of oral cancer in patients with alcohol and tobacco use to be more in males in group I. The predominance of oral cancer in males (96%) may be related to the high prevalence of use of alcohol and tobacco, a major oral cancer risk factor.

Our results revealed that combined exposure to tobacco and alcohol is strongly related to development of oral cancer. i.e. 84% of cases had oral cancer. These results are similar to studies of P.K. Varshney et al. This suggests the synergistic effect of alcohol and tobacco in carcinogenesis. It is proposed that tobacco is an initiator while alcohol is a promoter, presumably by either increasing the permeability of mucosa lining cells to tobacco carcinogens or by cellular lesions induced directly by alcohol metabolism.<sup>5</sup> Also, after alcohol intake, acetaldehyde (the first metabolite of ethanol) is locally formed in the oral cavity by oral mucosal alcohol dehydrogenases and by the oral microflora, both of which are able to oxidize ethanol to acetaldehyde. Also tobacco smoke contains high levels of acetaldehyde. There is convincing evidence for acetaldehyde being the ultimate local and topical carcinogenic compound behind alcohol intake in humans.<sup>6</sup> Also, tobacco was found to be an important risk factor for oral cancer as 80% of cases in group II had oral cancer.

In our study, carcinoma of tongue was seen in 66.6% cases with ventral surface of tongue being the most common site (19.04%). These findings were not in accordance with those reported by P.K. Varshney et al. in 2003, in which

carcinoma of tongue was reported in only 24% of cases. Our findings can be explained based on the assumption that the ventral surface of tongue is lined by thin non-keratinized epithelium and most of the carcinogens readily penetrate this thin epithelium to reach the progenitor cell compartment. Also, tobacco products and alcohol in solution constantly accumulate in the floor of the mouth and bathe the tissues of the floor of the mouth and the ventrum of tongue.<sup>7</sup>

In our study, the prevalence of T<sub>3</sub> and T<sub>4</sub> tumours was extremely high, i.e. 57.14%, which is in accordance with the result of the study by GS Dias et al. in 2007 and the involvement of regional lymph nodes was observed in 76.2% of cases. A probable factor related to the occurrence of T<sub>4</sub> tumours could be that in alcoholics with tobacco habit, the carcinogenesis may occur at a faster rate. Therefore, in a short duration of time, tumour will reach T<sub>4</sub> size as seen in our study.

In our study, 52.3% of the cases were histologically diagnosed as poorly differentiated tumours while well differentiated tumours were seen in 33.3% of the cases. These results are similar to a study by Effiom et al (2008). It was also shown that histological grade could be possibly associated with the site of the tumours as oral carcinoma affecting the buccal mucosa, gingivobuccal sulcus and lower lip were predominantly well differentiated, while tumours affecting the floor of mouth, borders and ventral surface of the tongue were predominantly poorly differentiated.<sup>8</sup>

Although, some studies have reported that smoking and alcohol abuse affect the individual components of liver function tests (including serum aminotransferases) in different ways, our results were not found to be statistically significant as 68% cases and 72% controls had normal SGOT levels and 64% cases and 63% controls had normal SGPT levels.<sup>9</sup> This suggests that oral cancer occurs much earlier than changes in liver function are evident.

### Conclusion:-

The combined deleterious habit of alcohol and tobacco increases the risk of oral cancer. Also tobacco is a significant risk in causation of oral cancer. The difference in prevalence of oral cancer in patients with and without alcohol habit was not found to be statistically significant. However, a no correlation has been found between the serum aminotransferase levels and prevalence of oral cancer in persons with alcohol abuse.

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