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Oral Cancer & Risk Factors: A Review

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ABSTRACT:
Oral health can be considered a state of complete absence from any form of oro-facial pain, oral and maxillofacial cancer, oral ulcers and embryological disorders such as cleft lip and palate, periodontal disorders, caries and subsequent loss of tooth, and any other form of diseases that affect the oral cavity. A quality oral health permits a person to carry out any necessary oral functions which, includes speech and mastication without any form of vital diseases and disorders. Considering both sexes as well as the age groups, oro-pharyngeal carcinoma ranks 6th in the world; it is also the third most common site among males in developing countries. In developed countries, men are affected thrice as compared to women, probably because of increased consumption of alcohol and tobacco. Socioeconomic discrepancies are considered to be playing a major role. The main aim of the review is to recognize the potential risk factors involved in the development of oral cancer.

Keywords: Oral Health; Oral Cancer; Tobacco; Risk Factors.

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INTRODUCTION:

Oral cancer, over the period of time, has become a menace and has been affecting a wide range of populations. Oral cancer is the eleventh most common cancer globally,[1] India has the highest incidences of oral cancer and accounts for about 30% of all new cases annually. Oral cancer is increasing in Indian subcontinent mainly due to lack of hygiene, tobacco use, chewing tobacco leaves, smoking and many other factors. A large number of studies have confirmed the roles of tobacco smoking, alcohol drinking and betel quid chewing in etiology.[2] A recent survey of cancer mortality in India shows cancer of the oral cavity as the leading cause of mortality in men and responsible for 22.9% of cancer-related deaths.[3] The tobacco epidemic is estimated to kill 8 million people annually, with 80% of deaths in developing countries by 2030.[4] The term oral cancer refers to the lips, buccal mucosa, alveolar ridges, retro molar trigone, hard palate, floor of the mouth and anterior two-thirds of the tongue. Oral cancer or oral cavity cancer, a subtype of head and neck cancer, is any cancerous tissue growth located in the oral cavity.[5] A large number of factors have been attributed as the possible risk and etiological factors for oral cancer.

BETEL QUID WITH TOBACCO:

The most common form of consuming tobacco, which is believed to be as high as 40% among adults is betel quid with tobacco. The problem in studying the betel quid with tobacco is that is it consumed in a number of forms with a wide spectrum of ingredients. Betel nut can be replaced by an Areca nut in a fermented form. There could be an addition of a number of ingredients which includes substances like lime and spices as well as tobacco and catechu. Asian countries are most the biggest consumers of betel leaf in the form of betel quid in paan, with or without tobacco, which has an adverse effect due to its subsequent addiction.[6] In the year of 2004, WHO (World Health Organization) reported that western countries are at the lower limit in the terms of oral cancer cases when

compared to Asian countries.[7] When a group of scientists studied the occurrence of oral cancer in patients using tobacco in the form of betel quid, they found squamous cell carcinoma in the oral cavity as the most common malignant tumour. The report suggested that the most common locations involved the cheeks and corner of the mouth.[8]

TABLE 1- RISK FACTORS/ ETIOLOGICAL FACTORS FOR ORAL CANCER

RISK FACTORS
-Betel quid with tobacco
-Alcoholic beverages
-Smokeless Tobacco
-Tobacco smoking
-Human papilloma virus
-X-radiation and Gamma-radiation

ALCOHOLIC BEVERAGES:

With the increasing abuse of alcohol all around the world, alcohol is now considered to be a major risk factor for oro-pharyngeal cancer. A study was conducted to determine whether the amount of alcohol consumption is an important assessment factor in the diagnosis of oral cancer.[9] The study included about 26 cases of oral and pharyngeal cancer. The results of the study were as follows: Research studies carried out over a period of time shows a strong association between alcohol consumption and various forms of cancer.[10]

The National Toxicology Program of the US Department of Health and Human Services presents a report which shows that the consumption of alcohol is a potential human carcinogen. A variety of reports suggest that the more alcohol a person drinks, the higher is the risk of developing an alcohol-associated cancer. In the year of 2009, about 19,500 deaths which is about 3.5% of all carcinoma deaths were estimated to be related to the problem of alcohol consumption.[11]

TABLE 2: CONSUMPTION V/S RELATIVE RISK

Consumption (gm/day)	Relative Risk (RR)
25	1.75
50	2.85
100	6.01

SMOKELESS TOBACCO:

Chewing and Snuffs are the two important forms of smokeless tobacco. Snuff may be used in either dry or wet state while chewing tobacco is wiry than snuff and prevail in 3 forms:

- Loose leaf
- Plugs
- Twist

The most common site for the placement of the smokeless tobacco is usually buccal vestibule. The adverse effects will be most commonly observed in the location of tobacco placement as well the surrounding periodontium. The lesion can range from white color to light yellow up to dark brown color. Following the episode of discoloration, if the tobacco abuse is continued, the localized region will become thickened.[12]

Wray and McGuirt critically studied the records of about 128 patients. Out of those involved subjects, about 78% were involved with the use of smokeless tobacco for more the 40 years. The results showed a 3 year survival rate of only 47% and a 5 year survival rate of close to 37%. Also detailed clinical examination showed that nearly 40% of the patients were diagnosed with oral leukoplakia as well as oral erythroplakia or either one of them. The study was based on the ideology to educate people at a very early stage about the involvement of tobacco in causing oral carcinoma.[13]

TOBACCO SMOKING:

Cigarettes available in the market are believed to be containing over 4500 chemicals and about 70 of these chemicals are known to be carcinogenic. Tobacco smoking can be described as a process of burning tobacco, which is followed by the inhalation of smoke. Smoking has always been considered to be the most common mechanism of tobacco consumption and is also believed to be one of the most vital risk factors for the development of oral carcinoma. Out of all the cancers involving oro-pharynx, about 80% of them are associated with people who consume tobacco in the form of cigarettes, pipes and cigars.[14] If a person has been involved with tobacco

smoking even once is believed to be up to 9 times more likely to develop carcinoma when compared to a person who has never smoked. If a person has been involved with tobacco smoking of about 1 pack a day is believed to be about 16 times more likely to develop oral and laryngeal carcinoma when compared to a person who has never smoked.[15]

HUMAN PAPILLOMA VIRUS (HPV):

Detailed understanding of the Human Papilloma Virus suggests that it is a non-enveloped DNA virus which is double stranded and has been associated as an etiological factor in a number of anal & genital diseases, and a huge range of disorders from cervical cancer to oral cancer. In the year of 1983, Syrjanen suggested that carcinoma of the head and neck region may have a strong association with human papilloma virus.[16] Patients who are detected with oral cancer associated with human papilloma virus are usually in a young age group and with no strong history of consumption of tobacco or alcohol. Human papilloma virus positive tumours more frequently existing at an advanced stage and often with lymph node involvement. Now, according to the date collected, one of the major causes of oral cancers in North America, Europe, and Japan is believed to be human papilloma virus.[17] Human papilloma virus has been implicated in excess of 60% of the cases of oral carcinoma.[18] This study suggests that every 365 days about half a thousand of women and nearly five and a half thousand men in the United States will result in the development of oral carcinoma due to human papilloma virus.[19]

X-RAYS AND GAMMA RAYS:

Although most of the X-rays and gamma rays that hit the earth come from natural sources present in the outer space in the form of gaseous radon, radioactive substances and cosmic. However, one cannot deny that this form of radiations is also man-made at times. The majority of the man-made X-rays and gamma rays are developed in nuclear power plants. X-rays are also often utilized in very small proportions for medical imaging tests which includes ortho-pantomography. Treatment of carcinoma and security scanners at the airports is also amongst the other common uses of x-rays.

Even though x-rays and gamma rays seem to be a source of convenient treatment options, it has been noted that when such forms of ionizing radiations passes through a cellular structure of the human body, it leads to mutations in cellular DNA. This sudden mutation may lead a foundation for the cellular death, but sometimes it may lead to cancer later on. The most important determinant factor is the amount of the exposure of the cells to the radiation. The damage is way too fast as far as the cellular death is considered, but other discrepancies such as the dawn of carcinoma may take several years to grow. According to the study done by Memon et al,[20] the number of exposures to x-rays is not only associated with the oral cancer, but also linked with the occurrence of the thyroid cancer.

CONCLUSION:

Currently, oral carcinoma is believed to be one of the most customary causes of morbidity and mortality which has been backed by years of study. Low-income and disadvantaged groups are generally more exposed to avoidable risk factors such as environmental carcinogens, alcohol, infectious agents, and tobacco use. Even though there has been an exponential rise in the development of extensive oral cancer screening techniques in the last couple of decades, it is necessary to understand all the potential risk factors associated with the oral cancer and take every possible step to prevent cancer.

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