TOBACCO USE: A STUDY OF ITS CYTOGENETIC AND DNA DAMAGING ABILITY

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ABSTRACT: From times unknown tobacco and its consumable other forms have been fancied by man. Men suffered consequences but not until the second half of the twentieth century its side effects were studied. In the turn of the century cancer turned out to be the top killer worldwide and the tobacco use was found to be the main culprit of the above said condition. The study mainly aims to assess the harmful effects in the oral epithelial cells with each passing years. The sample size consisted of 60 people who were divided into four groups. All the volunteers were between 25 to 50 years. It is very clear in the study that the risk of having a carcinoma increases with the time of consumption of tobacco. The micronucleus study and the comet assay can be used to investigate and screen the population at risk.

KEYWORDS: Tobacco, smoking, Oral cancer.

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INTRODUCTION: Worldwide oral cancer ranks eighth position in cancer incidence.[1] From times unknown tobacco and its consumable other forms have been fancied by man. Men suffered consequences but not until the second half of the twentieth century its side effects were studied. In the turn of the century cancer turned out to be the top killer worldwide and the tobacco use was found to be the main culprit of the above said condition.

Main cause of oral carcinoma and the precancerous conditions of mouth is the tobacco, both smokeless and smoked version are equally responsible to the killings. Factors such as genetic, environmental and gene-environment interactions, viral, and behavioral (smoking, alcohol) have been implicated in the etio-pathologic continuum of oral cancer including recent population-based studies.[1] One of the important hallmarks for cancer progression is DNA damage, resulting either from various carcinogens accumulating from etiologic influences or due to genetic errors.[2] Oral mucosal cells are the first barrier for inhalation or ingestion route and are capable of metabolizing proximate carcinogens to reactive products.[3,4,5,6] 90% of all cancer starts in oral epithelial cells.[7]

In India thirteen percent of the total deaths are amounted by cancer and oral carcinomas is by far the most common encountered. To add on the problem it is encountered in younger generation. The other varieties of cancer are seen decades later when compared to the oral carcinoma. The main reason for this is chewing tobacco. Gutkha and pan masala have been shown to be carcinogenic in experimental animals, causing tumors in various organs. Pan Masala acts as a tumor promoter in mice.

The present study is done to find out the morphological damages caused by tobacco (smokeless and smoke) in the oral mucosa cells. The study mainly aims to assess the harmful effects in the oral epithelial cells with each passing years.

MATERIALS AND METHODS: The study was done in Kanachur Institute of Medical Sciences, Deralakatte, Mangalore. The sample size consisted of 60 people who were divided into four groups.

All the volunteers were between 25 to 50 years.

The first group were considered the control group and did not have the history of tobacco consumption.

The second group consisted of people who gave personnel history of tobacco consumption for more than one year but less than five years.

The third group consisted of people who gave personnel history of tobacco consumption for more than five years but less than fifteen years.

The fourth group consisted of people who gave personnel history of tobacco consumption for more than fifteen years.

Two sets of oral mucosal scrapings were taken and centrifuged.

The first samples after centrifuge method were put on a slide and was stained with Giemsa stain. The micronucleus were counted and noted.

RESULTS:

DISCUSSION: Micronucleus has been used since 1937 as an indicator of genotoxic exposition based on radiation studies conducted by Brenneke and Mather, as reported by Heddle et al., (1983). Since the prolonged use of the chewing items such as supari, pan masala/gutkha can generate a risk of developing different types of oral cancer;

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it becomes necessary to screen the population for its possible risk. In the present study it is clearly seen that as the risk increases as the years passes by. The cytological and genomic changes cause the drastic effects. The study is in agreement with the other studies.

CONCLUSION: It is very clear in the study that the risk of having a carcinoma increases with the time of consumption of tobacco. The micronucleus can be used to investigate and screen the population at risk.

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Groups	First	Second	Third	Fourth
Mean number of micronucleus cells in one smear	1	9	17	21
Mean number of micronucleus found in cells with micronucleus	1	3.324	5.716	7.974

Table 1: Frequency of Distribution of Micronucleus

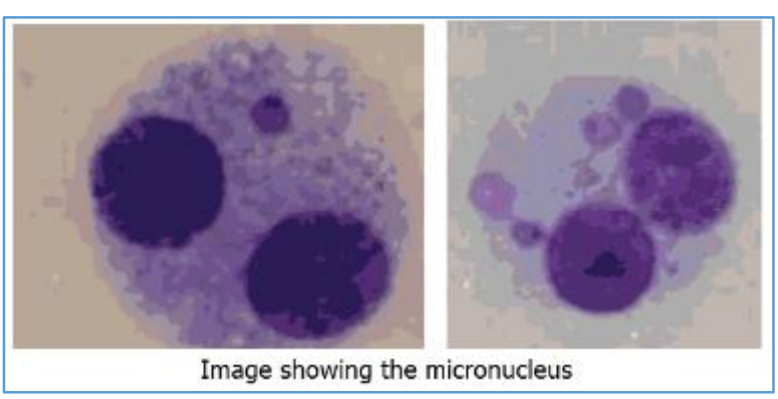

Image showing the micronucleus