

# A Study of Micronucleus in Tobacco Chewers and Tobacco Smokers

Dr Indira S Bangera

Associate Professor, Department of Pathology, Father Muller Medical College, Mangalore, India

**Abstract:** 90% of all cancer starts in oral epithelial cells.<sup>7</sup> In India about 15 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 generations. The other varieties of cancer are seen decades later when compared to the oral carcinoma. The main reason for this is chewing tobacco or smoking. 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. The study was done in Father Muller Medical College Mangalore. The sample size consisted of 90 people who were divided into three groups. All the volunteers were between 25 to 50 years so as to reduce the age related bias. The first group was 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 in the form of smoking. The third group consisted of people who gave personnel history of tobacco consumption in the form of tobacco chewing. The mean age of the population in Group 1 was found to be 26.45 years, in the Group 2 it was found to be 25.73 years and in the group 3 it was found to be 24.83. In the present study micronucleus was not found to be present in the non – consumers of tobacco. Mean number of micronucleus cells in one smear in tobacco smokers was found to be 16 per smear and 19 per smear in tobacco chewers. Mean number of micronucleus cells when averaged per cell was found to be 3.74 in tobacco smokers and 5.76 in tobacco chewers. This study clearly indicates the effects of consumption of tobacco in any of the forms.

**Keywords:** Micronucleus, Tobacco Chewers, Tobacco smokers.

## 1. Introduction

Worldwide oral cancer ranks eighth position in cancer incidence.<sup>1</sup> Throughout History consuming tobacco and its consumable other forms have been fancied by man 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 one of the formidable killers worldwide and the tobacco use was found to be the main substance for causing the same. Main cause of oral carcinoma and the pre - cancerous conditions of mouth is the tobacco, both smokeless and smoked version are equally responsible for the ever growing rate of carcinoma.

Factors such as genetic, environmental and their combined interactions, viral, and behavioral (smoking, alcohol) have been implicated in the etio-pathologic continuum of oral cancer including recent population-based studies. 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.<sup>2</sup> Oral mucosal cells are the first barrier for inhalation or ingestion route and are capable of metabolizing proximate carcinogens to reactive products.<sup>3,4,5,6</sup>

90% of all cancer starts in oral epithelial cells.<sup>7</sup> In India about 15 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 generations. The other varieties of cancer are seen decades later when compared to the oral carcinoma. The main reason for this is chewing

tobacco or smoking. 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.

## 2. Aims and Objectives

To Study of Micronucleus in Tobacco Chewers and Tobacco Smokers.

## 3. Materials and Methods

The study was done in Father Muller Medical College Mangalore. The sample size consisted of 90 people who were divided into three groups.

All the volunteers were between 25 to 50 years so as to reduce the age related bias.

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 in the form of smoking.

The third group consisted of people who gave personnel history of tobacco consumption in the form of tobacco chewing.

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.

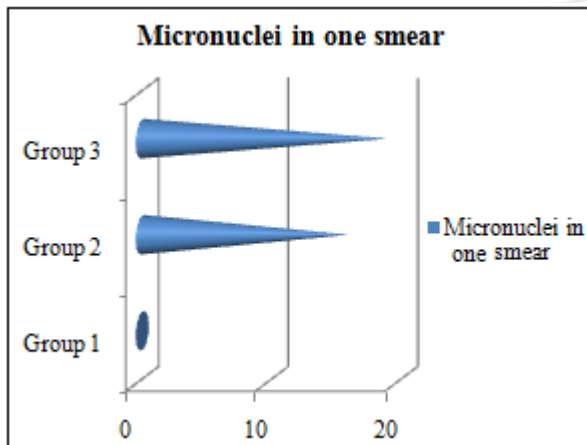
#### 4. Results

**Table 1: Mean age of the population**

Group 1	Group 2	Group 3
26.45 years	25.73 years	24.83 years

**Table 2: Mean number of micronucleus cells in one smear**

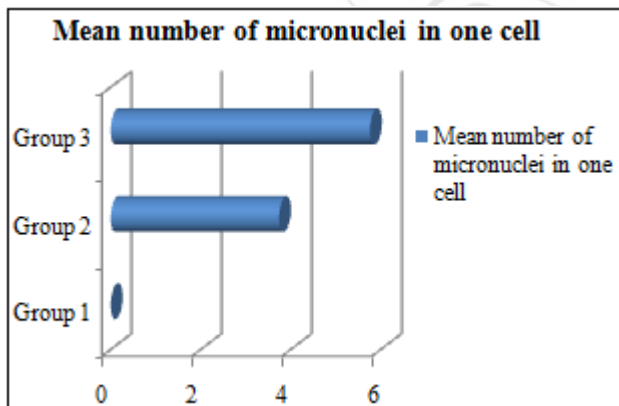
Group 1	Group 2	Group 3
00	16	19



**Image 1: Mean number of micronucleus cells in one smear**

**Table 3: Mean number of micronucleus found in cells with micronucleus:**

Group 1	Group 2	Group 3
00	3.74	5.76



#### 5. Discussion

The mean age of the population in Group 1 was found to be 26.45 years, in the Group 2 it was found to be 25.73 years and in the group 3 it was found to be 24.83.

In the present study micronucleus was not found to be present in the non – consumers of tobacco. Mean number of micronucleus cells in one smear in tobacco smokers was found to be 16 per smear and 19 per smear in tobacco chewers.

Mean number of micronucleus cells when averaged per cell was found to be 3.74 in tobacco smokers and 5.76 in tobacco chewers.

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; 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.

#### 6. Conclusion

This study clearly indicates the effects of consumption of tobacco in any of the forms. Though it is less effective in the form of smoking but on a long run every form of tobacco smoking is dangerous.

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