Background of the study

Early identification of the process of carcinogenesis is challenging and when decoded, would provide an efficient diagnostic and prognostic tool in the early identification of neoplastic change in the tissues. Micronuclei count could act as an efficient biomarker of this process. Moreover, the micronuclei test is a non-invasive diagnostic test with a sensitivity of 94%, specificity of 100% and accuracy of 95%. Thereby micronuclei identification would act as an early predictor of cytogenetic changes in the oral epithelial cells of tobacco users.

Aim

To evaluate the frequency of genotoxic changes in the smears of exfoliated oral epithelial cells using Papanicolaou (PAP) stain in tobacco users without lesions and tobacco users with precancerous lesions as compared with controls.

Objectives

1. Comparison of the frequency of occurrence of genotoxic changes between tobacco users with precancerous lesions and tobacco users without clinically evident precancerous lesions compared with healthy controls.
2. To propose oral mucosal micronuclei frequency as an early potential marker of genotoxic changes in oral epithelial cells.

Materials and methods

Out patients were examined and grouped into three groups following the inclusion and exclusion criteria of each group. Group 1 includes normal healthy individuals, Group 2 includes individuals with two years of smoking history without

any precancerous lesion and Group 3 includes individuals with histopathologically confirmed precancerous lesion (Leukoplakia). Smears were taken from buccal mucosa .The smears were air dried and stained with Deoxyribo Nucleic Acid (DNA) specific PAP stain using RAPID PAP™ staining kit. 100 cells were analyzed on each slide under 40 x magnification using light microscope with the help of AP viewer.

Results:

Group 1 consisted of normal healthy individuals showed MN mean value M= 4.25 (P=0.001) with the standard deviation value of SD=0.96.Group 2 consisted of smokers of two years duration showed the mean value M=13.30 (P=0.001) and the standard deviation value of SD=2.98 there by indicating a significant rise in the mean value when compared to the control group. Group 3 consisted of histopathologically proven precancerous lesion (leukoplakia) showed the mean value M=35.70 (P=0.001) and the standard deviation value of SD= 6.68 which shows a significant rise when compared to the other two groups.

Conclusion:

The increase in frequency of Micronuclei (MN) is very evident from the values obtained which correlates with the increased and abnormal mitotic process at the cellular level and the results were statistically significant. Analysis of the data obtained showed that MN were present in all groups and the frequency increases in tobacco users without lesions and further increase in MN was noticed in tobacco users with lesions. Hence we conclude that micronuclei assay can be used to detect early genotoxic changes.

Key words: Cytogenetics, Leukoplakia, Micronuclei, Tobacco use.