Abstract

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Rationale and Background: Smoking induces oxidative stress by causing an oxidant/antioxidant imbalance in the body leading to deleterious effects on various tissues. 8-hydroxy-2'-deoxyguanosine is a predominant form of free radical-induced oxidative lesions, and is widely used as a biomarker of oxidative stress.

Objectives: The aim of this work was to estimate blood 8-OHdG level as a biomarker of oxidative DNA damage in non-, passive as well as active smokers and to assess its relation with lifestyle determinants as well as its effects on oxidant/antioxidant status.

Participants and methods: The current work included 90 male participants who were classified into 3 groups; 20 non-smokers, 30 passive smokers and 40 active smokers. Data were collected by filling a premade questionnaire. Peripheral venous blood samples were withdrawn from each participant, centrifuged and the obtained serum was stored till used. 8-hydroxy-2'-deoxyguanosine, cotinine, malondialdehyde, superoxide dismutase and total antioxidant capacity levels were measured in serum. Coding and tabulation of data were done followed by statistical analysis.

Results: The mean age of the participants was 33.04 ± 11.52 years. Urban residents represented 58.9% (62.5% of active smokers). Married participants represented 62.2% (70% of active smokers). Physical work represented 77.8% (87.5% of active smokers). Active smokers with high educational level represented only 7.5%. The mean tea and coffee consumption rates among all participants were 3.65 ± 3.21 and 0.33 ± 0.98 cups/day respectively with increased rates in active smokers. The mean BMI of the participants was 26.28 ± 4.82 with a highly statistically significant difference between the studied groups ($p < 0.001$). There were highly statistically significant higher levels of 8-OHdG, cotinine and MDA and lower levels of SOD and TAC in active smokers compared to both non- and passive smokers. There were no significant associations between 8-OHdG level and age, exercise, tea and coffee consumption, smoking habits as well as BMI among the 3 studied groups.

Conclusion and recommendations: Smoking may enhance oxidative stress not only through the production of reactive oxygen radicals but also through weakening of the antioxidant defense systems. It is recommended to strengthen tobacco control measures, promote healthy lifestyle and conduct further work to reach a consensus on the background level of 8-OHdG.

Key words: Smoking, Oxidative, Stress, Antioxidant, 8-OHdG.