Evaluation of salivary catalase in smokers and non-smokers: role of oral hygiene and salivary pH.

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Saliva and its defence systems, mainly based on the action of antioxidants, play a significant role in maintaining oral health. Cigarette smoking causes a variety of deleterious effects, particularly in the oral cavity. Oxidative stresses play a causative role in the appearance of the side effects of smoking. The aim of the present study was to assess the effects of cigarette smoking on the salivary levels of catalase, and on salivary pH; the relationship of these parameters with oral hygiene was also evaluated.

Seventy-six subjects (24 males and 52 females) were enrolled for the study; their mean age was 36.7 (±18.0 years). Among the participants there were 35 smokers (15 males and 20 females) and 41 non-smokers (11 males and 30 females). All the subjects were interviewed about their oral hygiene habits. Their oral cavity was carefully explored. O'Leary plaque index and bleeding on probing were evaluated. After rinsing the mouth with water, 2 ml of unstimulated saliva was collected by the spitting method.

Catalase salivary activity levels were determined by spectrophotometric assay. Salivary pH was measured by pH meter. Data were analyzed using the SPSS (version 19) software.

The salivary catalase levels were found to be lower in smokers as compared with non-smokers ($P<0.01$). A significant positive correlation between salivary pH and catalase activity (Spearman's rho= 0.279, $P<0.02$) was observed. The salivary catalase levels were lower in males as compared with females, but the differences were not statistically significant ($P = 0.689$). Finally, a significant positive correlation between oral hygiene and catalase activity (Spearman's rho= 0.246, $P<0.05$) was detected.

Smoking resulted in changes in salivary antioxidant levels, salivary pH and oral hygiene. We observed that cigarette smoking decreased catalase activity through an interference with the detoxification of hydrogen peroxide. Oxidative stress status may lead to a large number of diseases, including precancerous and neoplastic lesions of the oral cavity. We observed that an excellent oral hygiene is effective in increasing the antioxidant capacity of saliva and may counteract the damage caused by cigarette smoking. Further studies are needed to elucidate the mechanisms involved and to evaluate the potential benefits of supplementary antioxidants.

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