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Title: Women are more sensitive to tobacco smoke - Some insights to immune system

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Body: Complex inflammatory processes and changes in immune system play a crucial role in the pathogenesis of smoking related diseases. We previously found some significant changes in cellular immune response in smokers with COPD. The aim of this study was to evaluate the impact of tobacco smoke on immune system in relation to sex. In cross-sectional study 31 healthy, non-smoking volunteers and 38 asymptomatic smokers (15 women, 23 men) who met WHO criteria of daily smoker were enrolled. The proportion of lymphocyte subpopulations was evaluated by flow cytometry with monoclonal antibodies against CD3, CD19, CD4, CD8, HLA DR, CD16/56, CD95, CD25 and CTLA4. Adiponectin concentration was measured using ELISA. A smoking cessation program was introduced to the smokers. There were no significant differences in the proportion of major lymphocyte subpopulations between current and never smokers. A significant influence of smoking duration on the increase of the proportion of CD95+ cells was observed. Non-smoking women compared with non-smoking men were characterized by significant variation in the proportion of CD95+ cells. We did not observe any significant influence of tobacco smoke on the proportion of CD25+ T cells and CTLA4+ cells in men, while in women these populations were reduced in the group of smokers when compared with nonsmokers (CD4+/CD25+: 13.9 vs 18.8%, CD8+/CD25+: 2,2 vs 2,4%, CD4+/CTLA4+: 1,4 vs 1,1%, respectively). The higher serum concentration of adiponectin was noted in smoking when compared to non-smoking women and to men group (10300 vs 8600 vs 5500 ng/mL). Changes in the immune system of women who are active smokers are similar to those observed in COPD and are more pronounced than in men.