

Effect of Oxidative Stress from Smoking on Erythrocyte Phosphatidylserine Externalization

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Abstract : The smoking is one of the major risk factors in Non-Communicable Disease. Free radicals from cigarette smoke can cause oxidative stress. The oxidative insults can lead to red blood cell (RBC) senescence and are involved in the clearance of red blood cells. The objective of the present study is to assess the association between smoke, oxidative stress evaluated with serum Malondialdehyde (MDA) level and phosphatidylserine (PS) externalization (biomarker of RBC senescence) evaluated with annexin V binding. A total of sixty-four male volunteers aged 25-60 years old were recruited in this study. MDA was measured by colorimetric method. Annexin V binding was detected by flow cytometry. Our results show that there was a significant increase in MDA levels in cigarette smokers as compared to non-smokers ($p < 0.001$). However, there was no significant different between annexin V binding (% gate) in cigarette smokers and non-smokers ($p = 0.978$). These results provide evidence of free radical from smoking is associated with oxidative damage to erythrocytes. However, our results suggest that PS externalization is unlikely to have a role in RBC senescence pathway of stressed erythrocytes from cigarette smoke. The other biomarker of RBC senescence should be determined on cigarette smoker erythrocytes.

Keywords : malondialdehyde, phosphatidylserine, RBC senescence, annexin V

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