

Biomarkers Of Inflammation And Oxidative Stress In Patients With COPD And Healthy Smokers

P. Montuschi¹, M. Aiello², C. Buccellati³, G. Ciabattini⁴, A. Chetta², E. Clini⁵, G. Folco³, F. Fumagalli³, M. Losi⁵, D. Olivieri², R. Pisi², R. Shohreh⁴, A. Sala³

¹Catholic University of the Sacred Heart, Roma, Italy, ²University of Parma, Parma, Italy, ³University of Milan, Milan, Italy, ⁴University of Chieti, Chieti, Italy, ⁵University of Modena, Modena, Italy

Corresponding author's email: pmontuschi@rm.unicatt.it

We measured urinary 8-isoprostane (IsoP), a biomarker of oxidative stress, and fractional exhaled nitric oxide (FeNO), a biomarker of airway inflammation, in 8 patients with COPD who were current smokers (COPD CS) (7/1 males/females, age 60±4 yrs, mean±SEM, FEV₁ 65.8±4.8% pred), 9 patients with COPD who were ex-smokers (COPD ES) (7/2 males/females, age 66±3 yrs, FEV₁ 50.6±3.6% pred), and 10 healthy smokers (HS) (9/1 m/f, 43±4 yrs, FEV₁ 101.7±3.1% pred). We also measured prostaglandin (PG)E₂, that can have pro- and anti-inflammatory effects, in sputum supernatants in 6 COPD CS (5/1 males/females, age 60±5 yrs, FEV₁ 62.9±4.4% pred), 12 COPD ES (10/2 males/females, age 67±2 yrs, FEV₁ 51.3±3.3% pred), and 4 HS (3/1 males/females, age 43±6 yrs, FEV₁ 98.3±4.8% pred). Compared with COPD ES (268.0±28.8 pg/mg creatinine), urinary 8-IsoP was increased in COPD CS (506.1±85.6 pg/mg creatinine, p<0.05), but not in HS (385.9±52.2 pg/mg creatinine, p=ns), reflecting the higher degree of oxidative stress in COPD CS. FeNO was increased in COPD ES (24.8±6.0 ppb) compared with COPD CS (9.6±4.2 ppb, p<0.04) and HS (8.7±1.5 ppb, p<0.04) likely reflecting the inhibitory effect of smoking on endogenous NO production and/or increased NO breakdown due to free radicals. Compared with COPD ES (138.9±22.3 pg/ml), sputum PGE₂ was increased in COPD CS (308.0±96.6 pg/ml, p<0.04) and HS (385.5±134.6, p<0.01) indicating a stimulating effect of smoking itself on cyclo-oxygenase activity. Different biomarkers reflect different aspects of inflammation and/or oxidative stress in patients with COPD and healthy smokers.

This abstract is funded by: PRIN-Ministry of University and Research