

# Isoprostanes in blood plasma and in the Exhaled Breath Condensate (EBC) after 30 minutes breathing 280 kPa(a) oxygen – Pilot study

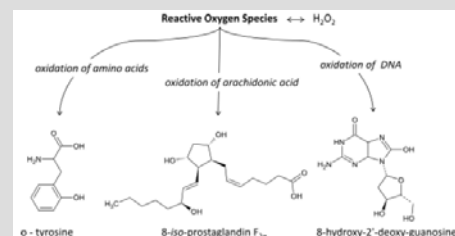
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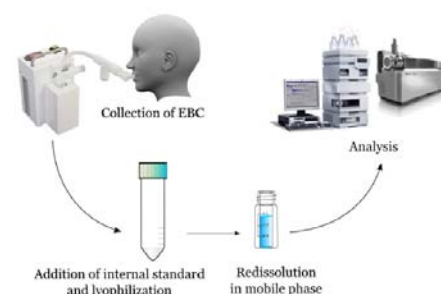
## INTRODUCTION

Isoprostanes are products of free radical-catalyzed lipid peroxidation of arachidonic acid. Plasma levels of metabolites of 8-isoprostaglandin-F<sub>2</sub>α (8-iso-PGF<sub>2</sub>α) are reliable markers of oxidative stress. The purpose of this study was to investigate whether the oxidative stress during 30 min of breathing 100% of oxygen at 280 kPa(a) in humans would significantly change the levels of 8-iso-prostaglandin-F<sub>2</sub>α (8-iso-PGF<sub>2</sub>α) both in exhaled breath condensate (EBC) and in blood plasma.

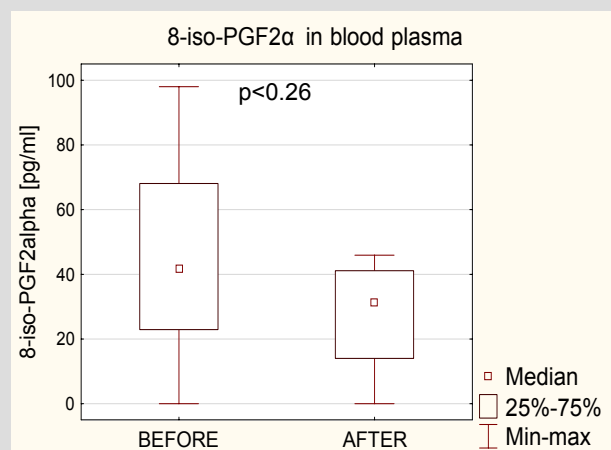
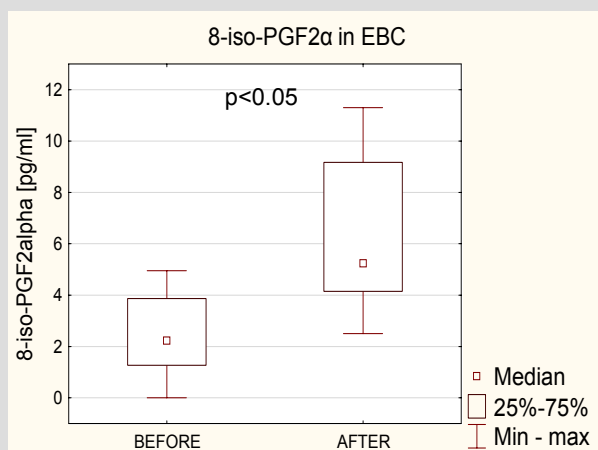


## MATERIAL & METHODS

The EBC and blood samples were collected immediately before and after the **exposure to 280 kPa(a) oxygen for 30 minutes** in a multiplace hyperbaric chamber from eight young (age from 21 to 35 years) healthy soldiers participating in the Oxygen Tolerance Tests (OTT) performed exclusively for military purposes. One millilitre of breath condensate was collected over about 10 minutes breathing tidal volume by exhaling air through tube system submerged in an ice bath (minus 10°C), then both EBC and plasma samples were immediately frozen and stored at minus 70°C until analysis. Analysis of 8-iso-PGF<sub>2</sub>α was done using the high-performance liquid chromatography/mass spectrometry (HPLC-MS). The research was approved by the local Ethics Committee.



## RESULTS



## RESULTS & CONCLUSIONS

**A statistically significant increase in the EBC levels of 8-iso-PGF<sub>2</sub>α was found after oxygen exposure when compared to initial levels ( $p < 0.05$ ), whereas there was no statistically significant change in blood plasma levels of 8-iso-PGF<sub>2</sub>α ( $p = 0.26$ ).**

These results provide further evidence that lipid peroxidation does occur in lungs of humans breathing high partial pressure of oxygen even for short period of time. The measurement of exhaled isoprostanes provides a noninvasive method to quantify local (i.e. pulmonary) oxidant stress in such circumstances.