

DIFFERENCES IN OXIDATIVE STATUS, LUNG FUNCTIONS AND PULMONARY SURFACTANT DURING LONG-TERM INHALATION OF MEDICAL OXYGEN (O₂) AND PARTIALLY IONIZED OXYGEN (O₂⁻ OR O₂⁺) IN GUINEA PIGS

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SUMMARY

We hypothesized, following the nature, that inhalation of partially ionized oxygen has less adverse effects on lung functions in comparison with medical oxygen. Guinea pigs inhaled air, 100% molecular medical oxygen (O₂mol), partially negatively (O₂neg) or positively (O₂posit) ionized oxygen during 17 and 60 h. After 17 h, accumulation of dityrosines, markers of oxidative injury, in lung homogenate increased in O₂neg and decreased in O₂posit groups vs.controls (both P<0,01). After 60 h, dityrosines rised after inhalation of O₂mol and O₂neg (both P<0,01 vs.controls), but not in O₂posit groups. Lysine-LPO products increased only in O₂mol (P<0,05) and O₂neg groups (P<0,001). Relative number of neutrophils in BAL fluid was elevated in all oxygen-treated groups with reduced numbers in O₂posit vs.O₂mol and O₂neg groups. After 60 h, surfactant activity was better in O₂posit vs.O₂mol groups. The weight it is the humidity of lung parenchym decrease under O₂mol but not under O₂neg or O₂posit In conclusion, long-term inhalation of partially positively ionized oxygen is associated with less oxidative stress, better ability of surfactant to secure airway patency and milder lung inflammatory response than molecular or negatively ionized oxygen.

Key words: *oxygen, reactiv oxygen species, ROS, ionized oxygen, ionised oxygen therapy, partiel medical oxygen ionisation, oxygen humidification; oxidative damage; lung functions; pulmonary surfactant; guinea pig; hormesis theory,*
