

Kongress: 11th Int. Congress of Cardiothoracic and Vascular Anesthesia  
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Abstract Nr.: 38  
Kategorie: Coagulation  
Vortragssprache: E  
Vortragsart: P  
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Abstracttitel: INHALATION OF 80% OXYGEN INDUCES THROMBELASTOGRAPHICALLY  
DETECTABLE PRO-COAGULANT EFFECTS IN HEALTHY VOLUNTEERS

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Purpose: Evidence from experimental studies suggests a possible pro-coagulant effect of hyperoxemia when inhaling high oxygen fractions (FiO<sub>2</sub>). Platelet activation by reactive oxygen species (ROS) has been considered as a mechanism. We aimed at investigating the effect of high FiO<sub>2</sub> on the coagulation state.

Methods: In a prospective controlled study with crossover design, 10 healthy men aged 25 to 45 years inhaled 80% (treatment) and 21% oxygen (controls) for one hour. Coagulation state was assessed with thrombelastography (TEG®) using kaolin-activated aliquots from citrated blood samples at baseline, immediately after one hour of inhalation and 24 hours thereafter. Blood gas analysis was used to confirm high PaO<sub>2</sub> values in selected individuals.

Results: Inhalation of 80% oxygen caused a six-fold increase in PaO<sub>2</sub> (21% vs 80% O<sub>2</sub>: 10.37 ± 1.2 kPa vs 62.83 ± 3.17 kPa) and significantly increased the TEG® parameter maximum amplitude MA (p=0.043) after one hour of inhalation compared to inhalation of 21% oxygen. There were no detectable changes 24 hours later.

Conclusions: Inhalation of 80% oxygen over only one hour had significant thrombelastographically detectable pro-coagulant effects in healthy volunteers. The clinical relevance of this potentially detrimental pro-coagulant effect should be determined in surgical patients at risk and experimental studies should help to clarify the underlying mechanisms.