A Randomised Controlled Trial of Oxygen Therapy in Acute ST-segment Elevation Myocardial Infarction: The Air Versus Oxygen in Myocardial Infarction (AVOID) Study

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Background

Oxygen is commonly administered to patients with ST-elevation myocardial infarction (STEMI) despite previous studies suggesting a possible increase in myocardial injury due to coronary vasoconstriction and heightened oxidative stress.

Methods

We conducted a multicenter, prospective, randomized, controlled trial comparing oxygen (8 L/min) with no supplemental oxygen in patients with STEMI diagnosed on paramedic 12-lead electrocardiogram. Of 638 patients randomized, 441 were confirmed STEMI patients who underwent primary endpoint analysis. The primary endpoint was myocardial infarct size as assessed by cardiac enzymes, troponin (cTnI) and creatine kinase (CK). Secondary endpoints included recurrent myocardial infarction, cardiac arrhythmia and myocardial infarct size assessed by cardiac magnetic resonance (CMR) imaging at 6 months. Results

There was a significant increase in mean peak CK in the oxygen group compared to the no oxygen group (1948 U/Lvs.1543 U/L; means ratio, 1.27; 95% CI, 1.04 to 1.52; P= 0.01). Mean peak troponin was similar in the oxygen and no oxygen groups (57.4 mcg/L vs. 48.0 mcg/L; ratio, 1.20; 95% confidence interval [CI], 0.92 to 1.56;P=0.18). There was an increase in the rate of recurrent myocardial infarction in the oxygen group compared to the no oxygen group (5.5%vs.0.9%, P=0.006) and an increase in frequency of cardiac arrhythmia (40.4%vs.31.4%; P=0.05). At 6-months the oxygen group had an increase in myocardial infarct size on CMR n=139;20.3grams vs. 13.1grams; P=0.04).

Conclusion
Supplemental oxygen therapy in patients with STEMI but without hypoxia increased early myocardial injury and was associated with larger myocardial infarct size assessed at six months.

Disclosure: