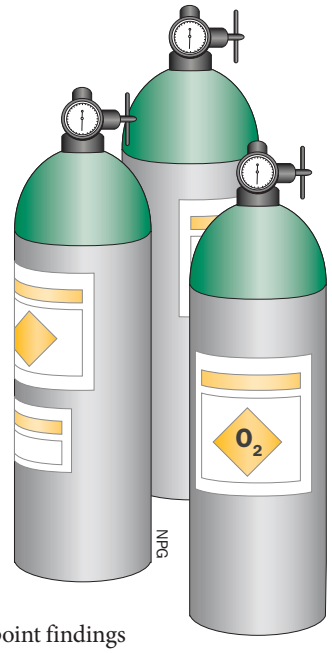
Nature Reviews Cardiology **12**, 444 (2015); published online 9 June 2015; doi:10.1038/nrcardio.2015.94

ACUTE CORONARY SYNDROMES

Should routine oxygen therapy be AVOIDed in normoxic patients with STEMI?



Oxygen therapy is commonly used as part of the initial treatment of a patient with an ST-segment elevation myocardial infarction (STEMI), because the prescribing clinician believes that the supplemental oxygen might increase oxygen delivery to the ischaemic myocardium and thereby reduce myocardial injury. This belief is based on the findings of various studies. However, other results have indicated that supplemental oxygen might actually cause adverse outcomes in these patients. A new study has assessed the effects of supplemental oxygen therapy in normoxic patients in the setting of contemporary therapy for STEMI. The investigators concluded that "whilst oxygen therapy is appropriate in hypoxemic patients with complicated acute myocardial infarction", "routine high flow oxygen supplementation may be accompanied by harm".

In the prospective, multicentre, Air Versus Oxygen In myocarDial infarction (AVOID) study, 441 patients with STEMI were included in the analysis for the primary end point—myocardial infarct size as assessed by levels of the cardiac enzymes troponin I (cTnI) and creatine kinase (CK). Although mean peak levels of cTnI were similar for the two patient groups, the mean level of CK was significantly higher in the group randomly assigned to supplemental oxygen therapy than in the 'no oxygen' group (1,948 U/l vs 1,543 U/l, $P = 0.01$).

Whilst in hospital, mortality was similar for the two patient groups, but recurrent myocardial infarction (5.5% vs 0.9%, $P = 0.006$) and major cardiac arrhythmias (40.4% vs 31.4%, $P = 0.05$) were more common in the group that received oxygen therapy. At the 6-month follow-up, the rate of adverse outcomes was similar for the two patient groups, but cardiac magnetic resonance imaging demonstrated that median infarct size was possibly greater in the oxygen group than in the 'no oxygen' group (20.3 g vs 13.1 g, $P = 0.04$; 12.6% vs 9.0% of left ventricular mass, $P = 0.08$). Infarct size at 6 months significantly correlated to the initial in-hospital measurements of cTnI and CK.

The trial was not powered for clinical end points, and the investigators cautioned that their clinical end-point findings need to be confirmed in other studies. However, they point out that their study suggests "that withholding routine oxygen therapy is safe in normoxic patients with acute myocardial infarction."

Bryony M. Mearns

Original article Stub, D. *et al.* Air versus oxygen in ST-segment elevation myocardial infarction. *Circulation* doi:10.1161/CIRCULATIONAHA.114.014494

© 2015 Macmillan Publishers Limited. All rights reserved