

KEY ADVANCES PRACTICE ADVANCE

Avoiding Routine Use of Supplemental Oxygen for Patients with Suspected Acute Myocardial Infarction

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Why is this topic important? Routine administration of supplemental oxygen to patients with suspected acute myocardial infarction (AMI) has been a mainstay of treatment for decades. Recent research has demonstrated that this practice does not provide benefit for patients with suspected AMI who are not hypoxic, but also does not likely result in harm.

How will this change my clinical practice? The routine emergency department management of the patient with suspected AMI does not require supplemental oxygen unless their oxygen saturation is <90% or the patient is in respiratory distress.

Synopsis Focus Points: Emergency physicians are strongly recommended to not routinely administer supplemental oxygen to patients with suspected AMI unless hypoxic or in respiratory distress.

Background:

A 2016 Cochrane Review reported no difference in hospital all-cause mortality based on four trials that compared supplemental oxygen with ambient air in patients with AMI; however, due to study limitations, these conclusions were based on a very low certainty of evidence. (1) In 2017, a registry-based randomized trial (DETO2X) was published, which enrolled 6,629 normoxic (room air oxygen saturation $\geq 90\%$) patients with suspected AMI. The results were reported as an intention-to-treat analysis and demonstrated that routine supplemental oxygen at 6 L/min for 6 to 12 hours did not lower all-cause mortality (the primary outcome), cardiovascular mortality, or hospitalization for heart failure within 1 year compared with those receiving ambient air (all-cause mortality rate 5% vs 5.1%, respectively). (2,3) Subsequent meta-analyses that included the large DETO2X trial also reported a lack of mortality benefit of supplemental oxygen for normoxic patients. (4-6)

One interpretation of this evidence is that supplemental oxygen in suspected AMI is ineffective but safe, which may be untrue. Hyperoxia may cause harm by increasing coronary artery

vasoconstriction and vascular resistance, along with the potential myocardial injury related to free radicals. (1,4-6) However, a small trial that randomized 95 normoxic patients with ST-elevation MI (STEMI) undergoing acute percutaneous coronary intervention (PCI) to supplemental oxygen or air did not show any effect on the size of ischemia before PCI or on infarct size with follow-up cardiac magnetic resonance. The authors concluded that these findings support the safety of withholding supplemental oxygen in normoxic patients with STEMI. (7) Based on the current evidence, the routine use of supplemental oxygen in those with AMI is not recommended.

This is Level 1a evidence. (8)

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Resources for Additional Learning:

<https://pubmed.ncbi.nlm.nih.gov/?term=oxygen%20myocardial%20infarction>

<https://rebelem.com/?s=oxygen+myocardial+infarction>

<https://www.youtube.com/watch?v=Kps3VzbykFQ>

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