

Nitric oxide inhalation in heart attack patients sends mixed messages, but may offer benefit

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Inhaled nitric oxide, delivered to heart attack patients before and during treatment with percutaneous coronary intervention (PCI) did not reduce the extent of damaged tissue (infarct), but may have improved recovery, according to Hot Line results presented today at ESC Congress 2014.

The NOMI (Nitric Oxide for inhalation to reduce reperfusion injury in acute st-elevation Myocardial Infarction) trial was based on the hypothesis that [nitric oxide](#) inhalation can reduce the injury caused to heart tissue during reperfusion (restoration of blood flow when a blocked artery is re-opened), according to Stefan Janssens, MD, PhD from University Hospital Gasthuisberg of Leuven, Belgium.

The trial included 250 [heart attack patients](#) with ST elevation [myocardial infarction](#) (STEMI) who presented between two and 12 hours after symptom onset.

Patients were randomised to receive supplemental oxygen via face mask, with (n=125) or without (n=125) nitric oxide at a concentration of 80 parts per million.

The gas was started in the catheterization laboratory prior to PCI and continued up to 4 hours after the start of reperfusion.

Magnetic resonance imaging (MRI) was used to measure infarct size, assessed as a fraction of left ventricular (LV) mass, as well as to evaluate LV remodeling (injury-related changes).

The study found that between 48-72 hours after the procedure there were no differences in infarct size between [patients](#) who received nitric oxide and those who did not (18% vs 19.4%, P=0.44).

However, a pre-specified sub-group analysis of patients who had received intracoronary or intravenous nitroglycerin (IC/IV NTG) – the administration of which was left to the discretion of the local investigators- showed a significant interaction (P=0.014) with the use of inhaled nitric oxide. Among NTG-naïve patients (n=132), nitric oxide inhalation was associated with significantly smaller infarcts compared to patients who had previously received NTG (n=93).

In the total population, MRI at 48-72 hours showed a trend for improved LV functional recovery with nitric oxide, which became significant at 4 months (P=0.048).

Functional recovery was significantly better with nitric oxide in the sub-group of NTG-naïve patients.

Nitric oxide did not cause major adverse events, and for a secondary composite endpoint of death, recurrent ischemia, stroke or rehospitalisations it was associated with a trend towards a lower event rate (P=0.10).

The NOMI trial is the first to investigate the impact of nitric oxide inhalation on myocardial [reperfusion injury](#), infarct size, and cardiac recovery, said Professor Janssens.

"While it did not show a significant reduction in infarct size in the overall study population, the findings suggest that nitric oxide inhalation merits further investigation in STEMI patients," he concluded.

Provided by European Society of Cardiology

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