Solution does not reduce rate of progression to development of heart attack after chest pain

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Patients experiencing symptoms such as chest pain who received from paramedics an intravenous solution consisting of glucose-insulin-potassium (GIK) had no reduction in the rate of progression to heart attack and no improvement in 30-day survival, although GIK was associated with a lower rate of the composite outcome of cardiac arrest or in-hospital death, according to a study appearing in *JAMA*. The study is being published early online to coincide with its presentation at the American College of Cardiology's annual scientific sessions.

Laboratory studies suggest that in the setting of cardiac ischemia, immediate intravenous GIK reduces ischemia-related arrhythmias and myocardial injury. "The potential benefit of GIK is thought to be related to timeliness of administration after onset of cardiac ischemia, especially for prevention of cardiac arrest, for which risk is highest the first hour of acute coronary syndromes [ACS; such as heart attack or unstable angina]/acute myocardial infarction [AMI; heart attack]. To date, clinical trials of GIK may have missed the opportunity to detect this effect because enrollment and treatment have awaited hospital diagnosis of MI, most often ST-elevation myocardial infarction [STEMI; a certain pattern on an electrocardiogram following a heart attack], hours after ischemic symptom onset and initial coronary occlusion [blockage]. To achieve the potential benefits related to early treatment, GIK ideally should be administered on presentation of ACS in the out-of-hospital setting rather than awaiting diagnosis of MI or STEMI at the hospital,"

according to background information in the article.

Harry P. Selker, M.D., M.S.P.H., of Tufts Medical Center and Tufts University School of Medicine, Boston, and colleagues conducted the Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency care (IMMEDIATE) Trial, testing the effect of out-of-hospital emergency medical service (EMS) administration of GIK in the first hours of suspected ACS on progression to heart attack and on other outcomes including cardiac arrest, death, and heart failure (HF). The randomized, placebo-controlled trial was conducted in 13 U.S. cities (36 EMS agencies), from December 2006 through July 2011, in which paramedics, aided by electrocardiograph (ECG)-based decision support, randomized 911 (871 enrolled) patients with high probability of ACS. Participants were typical of patients presenting with suspected ACS and MI: average age was 63.6 years, 71 percent were men, and 86 percent presented with a chief complaint of chest pain. They were randomized a median (midpoint) of 90 minutes after ischemic symptom onset. Patients received intravenous GIK solution (n = 411) or identical-appearing 5 percent glucose placebo (n = 460) administered by paramedics in the out-of-hospital setting and continued for 12 hours.

The researchers found that for the primary end point of progression to heart attack, there was no statistically significant difference between patients in the GIK group (48.7 percent) vs. those in the placebo group (52.6 percent). For the major secondary end points, 30-day mortality was 4.4 percent with GIK vs. 6.1 percent with placebo; the composite end point of cardiac arrest or in-hospital mortality occurred in 4.4 percent with GIK vs. 8.7 percent with placebo.

Among patients who presented with ST-segment elevation on their initial out-of hospital ECG (163 who received GIK and 194 who received placebo), progression to MI occurred in 85.3 percent of those in the GIK

group vs. 88.7 percent in the placebo group. Thirty-day mortality was 4.9 percent with GIK vs. 7.7 percent with placebo; the composite of cardiac arrest or in-hospital mortality occurred in 6.1 percent with GIK vs. 14.4 percent with placebo.

The researchers also found that for those treated within the first hour, there was no difference between the GIK and placebo groups in rates of progression to MI, although occurrence of the composite of cardiac arrest or in-hospital mortality was lower in the GIK group vs. the placebo group.

The authors suggest that among the possible reasons this trial suggested potential benefit for some outcomes for patients presenting with ST-segment elevation is that participants in the IMMEDIATE Trial were treated much earlier.

"Further studies are needed to assess the out-of-hospital use of GIK as therapy for patients with ACS."

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