



Use of Arm Blood-Pressure Cuffs by Paramedics May Limit Heart Damage in STEMI Patients.

Patients with myocardial infarction who had a blood-pressure cuff applied to their arms by paramedics suffered significantly less myocardial damage, compared to patients who received standard care.

The result of this randomised trial from Aarhus University Hospital in Denmark was reported in the *Lancet*. Of 142 evaluable patients, those who had the cuff treatment plus standard care had a median cardiac salvage index of 0.75 one month later, compared to 0.55 in those receiving standard care alone ($P = 0.033$).

The result is thought to be due to a phenomenon called ischemic preconditioning. In cell cultures and animal models, depriving the myocardium (as well as the brain and some other tissues) of oxygen for brief periods helps them survive more severe and prolonged ischemia later on. Since the 1980s, some researchers have been trying to exploit this phenomenon clinically to improve recovery following

ischaemic events like heart attacks and strokes. Some research has shown that brief ischemia in one part of the body can provide protection elsewhere. This has been called remote ischemic preconditioning. For example, squeezing the arms of patients to create distal ischemia has been found to help reduce cardiac damage from surgery and angioplasty (Hausenloy DJ, et al. Effect of remote ischaemic preconditioning on myocardial injury in patients undergoing coronary artery bypass graft surgery: a randomised controlled trial. *Lancet* 2007; 370: 575–79).

The researchers wanted to test the approach as a real-world treatment for ST-elevation myocardial infarction (STEMI) in emergency situations. From February 2007 to November 2008, consecutive patients with suspected STEMI were randomised at the scene to receive standard care, either with or without four cycles of five-minute

applications of a standard inflatable arm cuff (inflated to 200 mm Hg) during transport to hospital. At hospital, patients had aspirin, clopidogrel (Plavix), and intravenous heparin; and then underwent revascularisation. Abciximab was infused during the intervention and then for 12 hours. The primary outcome measure was myocardial salvage index (MSI), which was determined with single photon emission CT (SPECT) imaging done at admission and at day 30.

333 patients were randomised. More than 50% were dropped from the data analysis. 32 were lost to follow-up, 77 had no SPECT imaging at day 30, 82 did not meet the inclusion criteria on arrival at hospital. The main reasons for non-inclusion on arrival were failure to confirm STEMI and a history of previous myocardial infarction. The losses and exclusions were almost equally divided between the treatment groups.

The differences in the means and medians of the MSI were both significant. Mean 30-day MSI in the cuff group was 0.69 (SD 0.27), compared to 0.57 (SD 0.26) for the control patients ($P = 0.033$). Degree of salvage (as a fraction of the left ventricle) was 16% (cuff treatment) versus 12% (control) ($P = 0.037$). Final infarct size was 4% (cuff treatment) versus 7% (control) ($P = 0.10$). Between the cuff group and the control group, there was no difference in cardiac deaths, re-infarction, or heart failure.

The researchers concluded that the remote ischemic preconditioning appeared to be beneficial, based on the surrogate end-point of MSI, and that a larger trial is warranted. The cuff treatment is simple and low cost, and can be started by first responders. **SMA**

Sources: (1) Bøtker H, et al. Remote ischaemic conditioning before hospital admission, as a complement to angioplasty, and effect on myocardial salvage in patients with acute myocardial infarction: a randomised trial. *Lancet* 2010; 375: 727–34. (2) Ovize M, et al. Giving the ischaemic heart a shot in the arm. *Lancet* 2010; 375: 699–700.