

Lozano H, Wu D, Bassuk J, Arias J, Kurlansky P, Lamas G, Adams JA. The effects of prostaglandin inhibition on whole –body ischemia-reperfusion in swine. American Journal of Emergency Medicine 2008;26:45-53

Division of Cardiology, Mount Sinai Medical Center of Greater Miami, Miami Beach, FL 33140, USA.

BACKGROUND: Prostaglandins (PGs), particularly PGE₂ and PGI₂, have a salutary effect on myocardial ischemia-reperfusion-induced myocardial damage. **OBJECTIVE:** We investigated acute PG synthesis inhibition on outcomes from whole-body ischemia-reperfusion injury using a well-characterized model of ventricular fibrillation (VF)-induced cardiac arrest in pigs. In addition, we assessed early postresuscitation myocardial function in survivors using echocardiography as well as a biochemical measure of myocardial tissue damage. **METHODS:** Twenty-six animals (weight range, 25-35 kg) received indomethacin (INDO; 2 mg/kg, nonselective cyclooxygenase (COX) 1 and 2 inhibitor), celecoxib (2 mg/kg; selective COX-2 inhibitor [COX-2-I]), or saline placebo 30 minutes before induction of VF. After 3 minutes of VF with no intervention, the animals received standard chest compression using an automated chest compression device (Thumper; Michigan Instruments, Grand Rapids, Mich) for 15 minutes. After 18 minutes of VF, a single dose of vasopressin and bicarbonate were administered and defibrillation attempted. Hemodynamics, regional blood flow, echocardiography, and serum troponin I measurements were performed before and after drug infusion or placebo, during cardiopulmonary resuscitation (CPR), and after return of spontaneous circulation (ROSC). **RESULT:** Return of spontaneous circulation to 180 minutes occurred in 9 of 10 animals receiving placebo, 7 of 8 animals given COX-2-I, and 3 of 8 animals given INDO (P = .01, placebo or COX-2-I vs INDO). Hemodynamics did not differ among groups over time. Indomethacin and COX-2-I attenuated the increase in regional blood flow in the heart and brain, observed in the placebo group, 30 minutes after ROSC. All 3 study groups had significant decrease in percentage of ejection fraction and fractional shortening after ROSC and significant increase in wall motion score index after ROSC. In the COX-2-I group, troponin I increased 9-fold compared with placebo, 180 minutes after ROSC. Whole-body ischemia-reperfusion and CPR significantly increased PGE₂ and PGI₂ levels. The latter were blunted by pretreatment with COX inhibition. **CONCLUSION:** These findings suggest that PGs have a critical role in myocardial function and viability during low-blood-flow states produced by CPR and possibly other low-blood-flow clinical conditions.