

SCA 13

**LIDOCAINE DOES NOT PREVENT COGNITIVE DYSFUNCTION AFTER CARDIAC SURGERY**

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**Introduction:** Cognitive decline after cardiac surgery occurs in as many as 50-80% of patients at discharge, declining to between 20 and 50% at 6 weeks. Lidocaine has been reported to offer neuroprotection through neuronal membrane stabilization, reduction of the cerebral metabolic rate of oxygen, and modulation of leukocyte activation. We therefore hypothesized that lidocaine administration during cardiac surgery would reduce postoperative cognitive dysfunction.

**Methods:** Following IRB approval, 250 patients undergoing elective valve or valve + CABG surgery were enrolled into this prospective, randomized, double-blinded trial. Patients were excluded if they had a history of symptomatic cerebrovascular disease, uncontrolled hypertension, alcoholism, psychiatric illness, renal failure, active liver disease, or less than a 7th grade education. Following induction of anesthesia, patients were randomized to receive: 1) Lidocaine as a 1 mg/kg bolus followed by a continuous infusion at 4 mg/min for 1 hour, 2 mg/min for the second hour, and then 1 mg/min through 48 hours postoperatively or 2) Placebo (normal saline) bolus and infusion. Experienced psychometricians blinded to the patient's treatment group evaluated the patients with a well-validated battery of 6 cognitive tests on the day before surgery (baseline) and again at 6 weeks. Cognitive deficit was defined by factor analysis as a decline of one standard deviation or more in at least 1 of 4 cognitive domains (dichotomous outcome). A change score (continuous outcome) was also calculated by subtracting the baseline from the follow-up sum of the 4 domain scores. The effect of lidocaine on postoperative cognition was tested using multivariate modeling accounting for age, years of education, baseline cognition, and diabetes. A P-value <0.05 was considered significant.

**Results:** 120 patients were randomized to receive lidocaine. Patients in the placebo and lidocaine groups were similar with regards to age, years of education, weight, history of diabetes, number of grafts, and bypass and cross-clamp time (P =NS) but differed in ethnicity in that a greater proportion of lidocaine patients were white (93.8% vs 83.6%, p=0.01). The overall incidence of cognitive deficit in the study population was 46.5%. Multivariate modeling revealed no effect of lidocaine when either the cognitive deficit (p=0.15) or continuous change score (p=0.10) was examined. An interaction between lidocaine treatment and diabetes was detected wherein diabetic patients receiving lidocaine experienced a higher rate of cognitive deficit (dichotomous outcome) and lower improvement in cognitive performance (continuous outcome, Figure 1).

**Conclusions:** Lidocaine administration during and after cardiac surgery does not reduce the high rate of postoperative cognitive dysfunction. The safety of lidocaine administration in diabetic patients undergoing cardiac surgery needs to be further evaluated.

