26447 - SERUM ERYTHROPOIETIN LEVELS INCREASE AFTER CORONARY ARTERY BYPASS SURGERY AND ARE ASSOCIATED WITH NEUROLOGICAL OUTCOME AT DISCHARGE FROM HOSPITAL.

Greg Haljan MD, Ainslie M Sutherland, BSc; John M Murkin, MD; Keith R Walley, St. Paul's Hospital And UBC, Vancouver, BC, Canada

INTRODUCTION: Coronary artery bypass surgery (CABG) is complicated by neurocognitive dysfunction (NCD) in 50-75% of patients at discharge, 20-50% at 6 weeks and 42% at five years. Erythropoietin (Epo) is produced by a variety of tissues in response to cellular ischemia and injury. We asked if CABG surgery was a stimulus to Epo production by measuring serum Epo levels at 0, 4, 12 and 24 hours, and asked if NCD was associated with serum Epo.

METHODS: Serum was drawn in 25 first-time CABG patients who had NCD testing pre-operatively, at discharge and at 3 months. NCD was defined as a 20% decline from baseline in 20% of tests. Serum Epo was quantified by ELISA kit from Stem Cell Technologies.

RESULTS: All patients were male, mean age 59 (range 42-82). 4 patients (16%) underwent off-pump CABG (OP-CABG). A history of MI was present in 44% patients, heart failure in 16%, atrial fibrillation in 16%, hypertension in 92%, diabetes in 40%, dyslipidemia in 80%, family history of MI in 40%, smoking in 44%, chronic obstructive pulmonary disease in 16%, and renal dysfunction (Cr >150 mg/dl) in 12%. No patients had a history of dialysis, Epo injections or a neurologic diagnosis. Mean pump time was 92 min (SD 27) and mean cross-clamp time was 66 min (SD 24). Median ICU LOS was 24 hours (IQR 24-42) and median Hospital LOS was 6 days (IQR 4-7). 31% of patients required a transfusion (median 2 units PRBC). 31% developed post-op afib. Mean hemoglobin (Hgb) post-op was 114 (SD 12.2). 60% (15/25) of patients suffered NCD at discharge and 52% (13/25) suffered NCD at 3 months. Four patients (3/10 without NCD and 1/15 with NCD) were missing 24h blood. Mean Epo levels for all patients rose significantly from 11.9 pg/ml (SD 8.0 pg/ml) to 18.8 pg/ml (SD 14.7) at 12h ($p<0.01$) and 32.1 pg/ml (SD 21) at 24h ($p<0.01$). Epo at any time point was not associated with on- vs off-pump CABG, nor with cross clamp time and pump time, nor with pre-op or post-op Hgb levels, nor transfusion incidence. Low pre-op Epo was associated with NCD at discharge (9.2 pg/ml (SD 5.9) vs 15.9 pg/ml (SD 9.3), $p=0.03$). Mean increase in Epo at 12h in patients with NCD at discharge vs non-NCD was 11.2 pg/ml (SD 14.7) vs 0.48 (SD 13.2), $p=0.08$, and at 24h, 24.9 pg/ml (SD 22.3) vs 13.8 pg/ml (SD 17.0), $p=0.26$. No significant differences were found in Epo levels between 3 month NCD and non-NCD patients.

CONCLUSIONS: Serum Epo levels rose significantly following CABG surgery, suggesting that the surgery results in significant hypoxia and cellular injury. Low pre-op serum Epo was associated with NCD at discharge, but not at follow-up. A trend to a greater increase in Epo was observed in patients with NCD at discharge. Off pump surgery did not appear to alter the Epo response.