

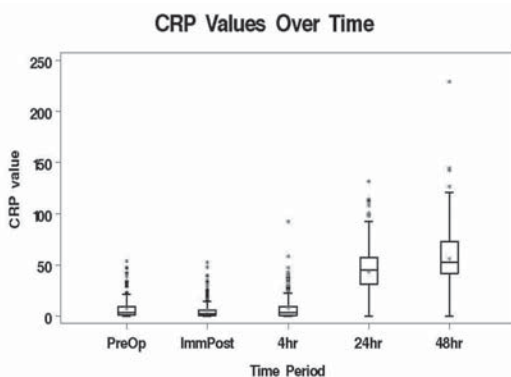
SCA 97

**THE ASSOCIATION OF C-REACTIVE PROTEIN AND MAJOR ADVERSE CARDIAC EVENTS IN CORONARY ARTERY BY-PASS GRAFT PATIENTS**

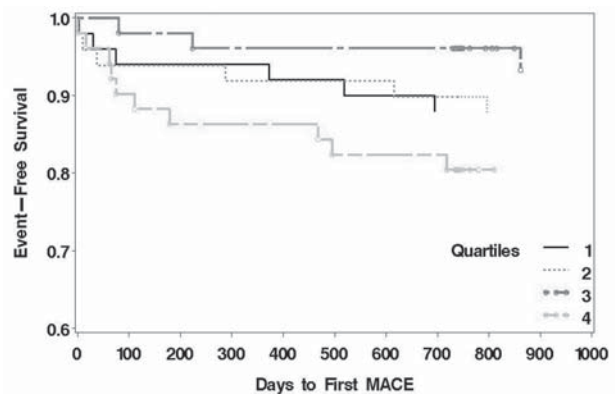
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**Introduction:** Inflammatory processes play a major role in the pathophysiology of atherosclerotic heart disease. Elevations in C-reactive protein (CRP), a marker of inflammatory activation, have been associated with an increased risk of cardiovascular events in patients with atherosclerosis (1-4). Cardiac surgery with cardiopulmonary bypass is known to induce a complex systemic inflammatory response, and elevated perioperative CRP levels have been shown to predict recurrence of ischemic events in patients undergoing coronary artery bypass grafting (CABG) (4). Our study hypothesized that higher preoperative levels of CRP would be associated with an increased incidence of early and late onset major adverse cardiac events (MACE) following CABG. We additionally hypothesized that an exaggerated inflammatory response to cardiac surgery (quantified by the change from preoperative to postoperative CRP serum levels) would result in a higher incidence of MACE.

**Methods:** Following IRB approval, demographic and CRP serum levels of patients undergoing elective CABG surgery between 01/1995 – 01/1999 were gathered prospectively. Exclusion criteria included a history of cerebrovascular disease, renal disease (creatinine > 2.0 mg/dl), acute infection or liver disease. The serum CRP levels were drawn preoperatively, at the conclusion of surgery, and 4, 24, 48 hours postoperatively (fig1). Collected blood was centrifuged, and the resulting supernatant was immediately frozen at -70 C for later analysis. The assays were performed using murine monoclonal antibodies in an immunometric “sandwich” format (Biosite Inc.; San Diego, CA) by personnel blinded to clinical outcomes. The MACE endpoints, over a maximum of 4 years of the study, were defined as: death, sudden cardiac arrest, re-do cardiac surgery, repeat cardiac catheterization, myocardial infarction. Only the first event was counted as an end-point. CRP was entered as continuous variable for comparison in Kaplan-Meier (log-rank test) and Cox multivariable analysis, adjusting for age and left ventricular ejection fraction (EF). A p-value < 0.05 was considered significant.



**Results:** 235 consecutive elective CABG patients were enrolled in the study and had preoperative CRP level determined. 179 patients had all 5 pre- and postoperative CRP levels determined. The mean age of patients was 62.9 ± 11 years, with a mean EF of 55 ± 10 %. The mean preoperative CRP level was 7.23 ± 9.7mg/dL. The mean of highest postoperative CRP level was 57.7 ± 31.4 mg/dL (fig1). At follow-up, there were 29 MACE: 11 cardiac deaths, 1 cardiac arrest, 1 re-do CABG, 5 Q-wave myocardial infarctions and 11 PTCA. 172 patients (83.8%) had no MACE up to 4 years after surgery. The Cox proportional hazard model did not demonstrate any relationship between preoperative CRP and MACE-free survival (p=0.58, hazard ratio 1.02, 95% CI 0.975- 1.05). Similarly, there was no apparent relationship between the change in post from pre CABG CRP serum levels and MACE-free survival at 4 years (p=0.50, hazard ratio 1.01, 95% CI 0.975-1.05) (fig 2).



**Discussion:** Our study demonstrates that preoperative CRP levels do not appear to be associated with the occurrence of MACE after elective CABG patients. This is in contrast to a smaller previously published study on CABG patients (4). In addition, the change in peak postoperative CRP from preoperative CRP serum levels, quantifying the surgery-induced inflammatory response, was not associated with MACE (fig 2). Our data demonstrated a substantial increase in postoperative CRP peaking at 24-48 hours among CABG patients, consistent with previously published observations (fig 1). Lack of cardiovascular specificity, the definition of elevated CRP and timing of sampling may limit the prognostic utility of CRP in CABG populations and reduce its predictive value in individual patients.

**References:**

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