Preliminary report on the interaction of apolipoprotein E polymorphism with aortic atherosclerosis and acute nephropathy after CABG.

BACKGROUND: Renal dysfunction is a serious complication of cardiac surgery that is highly associated with short- and long-term adverse outcome. While the apolipoprotein E (APOE) epsilon4 allele has been linked to the occurrence of both postcardiac surgery acute renal injury (epsilon4 favorable) and ascending aortic arteriosclerosis (epsilon4 unfavorable), the role of epsilon4 in the relationship between these two conditions is unknown. We hypothesized that patients with and without the epsilon4 allele (E4/non-E4) would have different associations between atheroma burden and postoperative renal dysfunction.

METHODS: Ascending, arch, and descending aorta atheromatous burden and APOE status were evaluated for 130 coronary bypass patients. Multivariable analyses were performed for aortic regions to assess the relationship of atheroma burden and APOE epsilon4 status with peak in-hospital postoperative serum creatinine. All p< 0.05 were considered significant. RESULTS: We found an interaction between E4 status (E4/non-E4; 24/106) and atheroma burden, with a much greater predicted peak in-hospital postoperative serum creatinine for increases in ascending aorta atheroma load for non-E4 patients versus E4 patients (beta coefficient
-0.13; \(p = 0.002\)). We also confirmed the association between ascending aorta atheroma and peak creatinine (beta coefficient 0.11; \(p = 0.0008\)), after controlling for E4 status, preoperative creatinine, and the E4-atheroma interaction. CONCLUSIONS: Equivalent ascending aortic atheroma burden is associated with a greater susceptibility to postoperative renal injury among patients undergoing cardiac operation who lack the APOE epsilon4 allele. Findings may be attributable to APOE-related differences in inflammation, susceptibility to atheroma detachment (eg, during operative aortic manipulation), or renal vulnerability to embolic injury.