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Supplemental Vitamin C did not Reduce the Incidence of Atrial Arrhythmia Following Cardiac Bypass Surgery

David R. Van Wagoner, PhD, Roberta Palumbo, RN, Jianbo Li, PhD, Cynthia A. Carnes, PharmD, PhD, A. Marc Gillinov, MD, Patrick M. McCarthy, MD and Mina K. Chung, MD. Cleveland Clinic Foundation, Cleveland, OH

Background: Oxidant stress is increased during the reperfusion phase following cardiac bypass surgery, and transient, post-operative atrial fibrillation (PO-AF) frequently occurs in patients during the first few days following surgery. In a non-randomized pilot study we previously reported a decreased incidence of PO-AF in sequential cardiac bypass graft surgery patients that received supplemental vitamin C (VC, 16.3%) vs. an age- and gender-matched control group (34.9%).
Methods: To fully evaluate the preliminary result, we performed a randomized, blinded, placebo-controlled study in 346 patients (177 VC, 169 placebo, P) undergoing cardiac bypass graft surgery. Patients with a history of AF were excluded. Patients received 2g VC the evening prior to surgery and 500 mg bid for the first five days after surgery. Baseline characteristics including age (62.7 years VC vs. 64.1 P) and ejection fraction (41.0% VC vs. 45.4% P) were well matched, as was gender, history of hypertension, diabetes, heart failure and other relevant comorbidities.
Results: The overall incidence of PO-AF in the present study was 24.6%. There was no difference in the incidence of PO-AF between the patients in the VC group (24.9%) vs. placebo (24.3%). There was a non-significant trend for benefit of VC in the off-pump population (23.3% VC vs. 32.7% P). There were no deaths during the perioperative period, and no differences between groups in the incidence of morbidities including stroke, MI, bleeding, renal failure, respiratory insufficiency or sepsis. There was also no impact on length of stay.
Conclusions: The incidence of PO-AF in this study was lower than in our pilot study. In this well controlled study, supplemental vitamin C as given had little impact on the incidence of post-operative arrhythmia, mortality or morbidity. Because study design did not include assessment of plasma antioxidant status, we are unable to discern whether the lack of efficacy was due to: 1) inadequate dosing, 2) superceding effects of other drugs, or 3) to flaws in the hypothesis that antioxidant supplementation has a beneficial impact in this setting.
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