Preventing complications of coronary angiography with N-acetylcysteine

One hundred twenty-one patients with chronic renal insufficiency (mean serum creatinine, 2.8 mg/dL; mean creatinine clearance, 23.3 mL/min) who were scheduled for coronary angiography were randomly assigned to receive N-acetylcysteine (NAC; 400 mg orally twice a day) or placebo, on the day before and the day of the procedure. Both groups were hydrated with 0.45% saline at a rate of 1 mL per kg of body weight per hour for 12 hours before and 12 hours after administration of the contrast agent (iopamidol). All patients were encouraged to drink if they were thirsty. Two of the 60 patients in the NAC group (3.3%) and 15 of the 61 patients in the control group (24.6%) suffered contrast agent-induced renal dysfunction, defined as an increase in the serum creatinine concentration of at least 0.5 mg/dL at 48 hours after administration of the contrast agent. Thus, NAC reduced the incidence of contrast agent-induced renal dysfunction by 86.4%, compared with placebo (p < 0.001).

Comment: Administration of contrast agents during coronary procedures can cause nephrotoxicity, apparently by inducing hypoxia of the adrenal medulla and exerting a direct toxic effect on renal tubular epithelial cells. Contrast agent-induced renal failure severe enough to require dialysis has been reported to occur in nearly 8 of every 1,000 of patients undergoing a coronary intervention. As the nephrotoxicity of contrast agents may be mediated by the production of free radicals, antioxidants such as NAC could be useful prophylactic agents. The results of the present study indicate that oral administration of modest doses of NAC, along with hydration, can greatly reduce the risk associated with coronary angiography. Whether other antioxidants, or combinations of antioxidants, would provide similar benefits requires further study.


Vitamins C and E prevent life-threatening complications in critically ill surgical patients

Five hundred ninety-five (595) patients admitted to a surgical intensive care unit (ICU), 91% of whom were victims of trauma, were randomly assigned to receive antioxidant supplementation or no antioxidants (control group) during their stay in the ICU, or for 28 days, whichever was shorter. Antioxidant supplementation, which was begun within 24 hours after surgery or trauma, consisted of 1,000 IU of vitamin E (dl-alpha-tocopheryl acetate) every 8 hours by nasogastric tube and 1,000 mg of vitamin C intravenously in 100 mL of 5% dextrose every 8 hours. After 28 days, the incidence of multiple organ failure was significantly lower by 57% in the antioxidant group than in the control group (2.7% vs. 6.1%), and the 28-day mortality rate was nonsignificantly lower by 44% (1.3% vs. 2.4%). The mean length of stay in the ICU was significantly lower by 17% in the antioxidant group than in the control group (5.3 vs. 6.4 days).

Comment: This study demonstrated that early administration of vitamins E and C reduced the incidence of organ failure and shortened length of ICU stay, and may have reduced the mortality rate, in critically ill surgical and trauma patients. These patients are at high risk of developing life-threatening complications such as pneumonia, acute respiratory distress syndrome, and multiple organ failure. As these complications appear to be mediated, at least in part, by reactive oxygen species, antioxidant supplementation represents a logical approach to improving outcome in the surgical ICU. In animal studies, large parenteral doses of vitamin C (200 to 1,000 mg per kg of body weight) increased survival after experimentally induced hemorrhagic shock. In contrast, the daily dose of vitamin C used in the present study was less than 50 mg per kg per day for a 70-kg person. It is possible that larger doses of vitamin C would provide even greater benefit to critically ill surgical and trauma patients. Nathens AB, et al. Randomized, prospective trial of antioxidant supplementation in critically ill surgical patients. Ann Surg 2002;236:814-822.

Unsaturated fatty acids for Huntington’s disease

Seventeen patients with Huntington’s disease were randomly assigned to receive, in double-blind fashion, a supplement containing unsaturated fatty acids or a placebo. The dosage of unsaturated fatty acids was eight 1-g capsules per day; each capsule contained 70 mg of gamma-linolenic acid (GLA), 35 mg of eicosapentaenoic acid (EPA), 20 mg of docosahexaenoic acid (DHA), 50 mg of alpha-lipoic acid, and 30 mg of vitamin E, with linoleic acid as a carrier. The placebo contained hydrogenated coconut oil, alpha-lipoic acid, and vitamin E. The mean duration of treatment was 19 months for active treatment and 20 months for placebo. On the Rockland-Simpson Dyskinesia Rating Scale, 7 patients receiving active treatment improved and 2 became worse, whereas 1 patient receiving placebo improved, 1 was unchanged, and 6 became worse (p = 0.01 for the difference in the response between groups). A similar trend (p = 0.08) was seen using the Unified Huntington’s Disease Rating Scale. No significant side effects were seen.

Comment: Huntington’s disease is a hereditary, progressive degenerative brain disorder that eventually results in death. Because no effective conventional treatment is available, the results of this new study are encouraging. In another recent double-blind study (Neuroreport 2002;13:123-6), supplementation with the ethyl-ester of EPA (1 g twice a day for 6 months) resulted in significant improvement in motor function in patients with Huntington’s disease. In addition, each of two patients in the active-treatment group who underwent MRI brain scans before and after treatment showed a reversal of cerebral atrophy. These two studies of unsaturated fatty acids offer new hope in the treatment of this devastating disease.


Taurine enhances treatment of iron-deficiency anemia

Fifty-one female university students with iron-deficiency anemia were treated with 325 mg/day of slow-release ferrous sulfate for 20 weeks. The women were grouped into pairs according to hemoglobin concentration, and the members of each pair were randomly assigned to receive, in double-blind fashion, 1,000 mg/day of taurine or placebo during the 20-week treatment period. Taurine was taken at bedtime, 6 to 8 hours after the iron (personal communication, Sirdah MM). Prior to treatment, the mean serum taurine concentration was significantly lower in the anemic women than in nonanemic controls, possibly because of a lower intake of meat (a major dietary source of taurine) in the anemic women. After