ANTI-OXIDANT SUPPLEMENTATION IN CRITICALLY INJURED PATIENTS

INTRODUCTION

The profound oxidative stress that occurs following injury results in an early
depletion of many endogenous antioxidants. Several studies have documented lower
circulating levels of both ascorbic acid and α-tocopherol in association with increased
levels of oxidized glutathione in the plasma of critically ill patients. One of the main
scavenger systems responsible for cleavage of free radicals is the selenium-dependent
 glutathione peroxidase, with protective action against membrane-damaging lipid
peroxidation. Selenium levels have also been shown to be lower in patients with severe
illnesses, including sepsis and SIRS, compared with controls.

Given the role of oxidative–mediated tissue injury in the development of ARDS
and multiple organ dysfunction (MOD), supplemental antioxidants may augment
endogenous defenses and serve to prevent the development of organ dysfunction. In
addition, there is increasing evidence that anti-oxidants such as ascorbic acid and α-
tocopherol may reduce infectious complications in the critically ill patient by restoring
neutrophil function and cellular-mediated immunity. As well, selenium replacement has
been shown to improve phagocytosis, natural killer cell activity, and immunoglobulin
synthesis, in addition to its apparent ability to attenuate organ dysfunction after
hemorrhagic shock.

PURPOSE

To standardize the supplementation of antioxidants in the acutely injured patient,
by which we may be able to attenuate the maladaptive inflammatory responses that lead,
or at least expedite, the development of ARDS and/or MOD. In addition, this anti-oxidant
replacement strategy may improve immune function among our most critically ill
patients, thereby decreasing their potential for development of nosocomial infections.
INTERVENTION

*Who receives anti-oxidant supplementation*

A. All adult trauma patients will receive seven (7) day course of high dose supplemental anti-oxidant therapy.
B. Excludes pregnant patients (ascorbic acid & selenium= pregnancy category C)
C. Excludes patients with creatinine > 2.5 mg/dL

*Supplement administration*

A. Ascorbic acid 1,000 mg PO/PT/IV q 8 hours
B. α-tocopherol 1,000 IU PO/PT q 8 hours
C. Selenium 200 mcg IV qd

*All vitamin supplements will be stopped upon discharge from the hospital*


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