Vitamin C Metabolism During Infections

A large number of studies have reported a decrease in vitamin C levels in plasma, white blood cells, or urine during infections. Tuberculosis has been studied most extensively (258-272), but low levels have also been reported in patients with other infections (271, 273-282). Several reports have noted that more severe forms of tuberculosis (263-272) and other infections (280) are often associated with lower vitamin C levels than the milder forms. It is noteworthy that plasma, leukocyte, and urine vitamin C levels are also decreased in the common cold (18,86,283-285).

The reasons for the lower vitamin C status in patients with infections have been considered in some of the papers. The dietary vitamin C intake of the patients may have been rather low in some studies (261,274,275). However, in some other studies the dietary vitamin C intake was comparable for the infectious patients and the healthy controls, suggesting that low dietary intake cannot be the only cause of reduced vitamin C levels in the patients (258,264,265,268). Furthermore, several studies have found differences in the metabolism of vitamin G test doses in patients compared to healthy control subjects (258,264,266-268,270,274,277,280):

Banerjee et al. reported that the decrease in the reduced vitamin C (ascorbate) level in plasma and urine is associated with a concomitant increase in the oxidized form (dehydroascorbate) (259,271,279). Their assay method found that in normal healthy people 5%-10% of the vitamin C is in the dehydroascorbate form, while 65%-80% was in the oxidized

form in patients who later died of meningococcal meningitis, tetanus, pneumonia, or typhoid fever (271). This observed increase in dehydroascorbate level is consistent with the idea that the role of vitamin C in infections is particularly that of a reducing agent (antioxidant) protecting against oxidants produced during an infection. Furthermore, the change in the oxidation level also indicates that the low levels of reduced vitamin C in patients with infections are not caused by poor diet alone, but are partially caused by physiological changes resulting from the infections.

The decrease in vitamin C levels in infected patients is no proof that supplementation would benefit the patients. Nonetheless, the consistent benefit of vitamin C supplementation on the severity of the common cold, along with the changes in the vitamin C metabolism in various infections including the common cold, provides a sound reason to wonder whether large doses of vitamin C might also have beneficial effects on other infections than the common cold.