LAY ABSTRACT

Since 1938 when Dorothy Andersen first described cystic fibrosis (CF), life expectancy of these patients has steadily improved. Much of the initial improvement resulted from better nutrition and management of pancreatic insufficiency. Despite these advances, premature death of most CF patients results from progressive lung destruction. Lung damage is caused by infections and the related overly exuberant efforts by the body to kill the bacteria present in the airways. The oxidants, radicals and enzymes produced by the body's inflammatory cells (white cells) to combat the infection inadvertently harm the lung. Thus, in CF patients, the lung, an innocent bystander in the battle between white cells and bacteria, suffers damage. Importantly, this damage is further exaggerated by inadequate antioxidant protection due to the decreased absorption of dietary antioxidants such as vitamin E (tocopherols), carotenoids and flavonoids. Vitamin E is one of the most important nutrients capable preventing damage from inflammation and from oxidant radicals, but the iintestinal malabsorption in CF limits absorption such that vitamin E supplements must be consumed. This proposal seeks to identify, similar to our observations in cigarette smokers, that the inflammatory responses in CF patients are so exuberant as to cause depletion of vitamin E. Based on our previous studies, we anticipate that this is the case, and plan to assess whether additional antioxidant supplementation such as with vitamin C or with the flavonoid, quercitin, can ameliorate the abnormal disappearance kinetics of vitamin E. We believe a better understanding of the fate of lipophilic antioxidants will allow further insights into optimal nutritional supplementation strategies for patients with CF.