

## Issue 100

### In a nutshell

Renal disease often imposes oxidant stresses on the body.

Trials of antioxidant supplementation have generally had positive outcomes, although subject numbers have not been large. Reported benefits include improvements in renal function and reduction in cardiovascular complications.

## Vitamin E and renal disease

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## NUTRITION RESEARCH REVIEW

### Study one: Renal disease and cardiovascular complications

Vitamin E supplementation significantly reduces the risk of cardiovascular disease in patients with end-stage renal disease, according to recent research from Israel.

**Subjects:** 196 subjects on haemodialysis with pre-existing cardiovascular disease.

**Method:** Randomised placebo controlled trial. Active treatment was supplementation with 800 IU/day of vitamin E.

Patients were followed for a median of 519 days during which the incidence of a 'primary cardiovascular end-point' was monitored. This end-point was based on the presence of any of a several cardiovascular disorders, including stroke, myocardial infarction, peripheral vascular disease and angina.

**Results:** Vitamin E supplementation produced a significant reduction in the risk of the primary cardiovascular end-point (reduction in relative risk= 0.46, 95% CI: 0.27-0.78, p=0.014).

Reference: Boaz M et al. Secondary prevention with antioxidants of cardiovascular disease in endstage renal disease (SPACE): randomised placebo-controlled trial. *Lancet* 2000;356:1213-1218

### Study two: Renal disease and lipid oxidation

Vitamin E supplementation decreases the oxidative susceptibility of LDL in patients with renal failure on dialysis, according to American research.

Patients with chronic renal failure receiving both haemo- and peritoneal dialysis were given 800 IU of alpha-tocopherol for 12 weeks and compared to control subjects. There was a significant correlation between vitamin E status and lipid oxidation oxidizability ( $r=0.54$ ,  $p=0.0003$ ).

Reference: Islam KN et al. Alpha-tocopherol supplementation decreases the oxidative susceptibility of LDL in renal failure patients on dialysis therapy. *Atherosclerosis* 2000;150:217-224

## Comments

Cardiovascular illness is one of the major causes of morbidity and death in patients with chronic renal disease. The reasons are thought to include abnormalities in lipid profile, increased lipid peroxidation and general imbalance of the anti-oxidant pro-oxidant balance.

These problems are partly caused by the renal disease itself, and partly by the treatment of the disease, particularly dialysis.

The kidney is involved in many aspects of antioxidant metabolism, not just excretion of antioxidants in the urine. Patients with renal disease seem to have a general lack of antioxidant capacity, as well as lower status of specific antioxidants (such as vitamins C, E, selenium, and coenzyme Q10).

The last few years have seen considerable interest in using antioxidant supplementation to combat these problems. In some cases supplementation has been given orally, but in other studies it has been added to the membrane of the dialysis machine itself.

So far results have been generally positive, even if subject numbers in these studies have not been large. Reported benefits of antioxidant supplementation have ranged from reductions in inflammation and improvements in renal function to decreased lipoprotein peroxidation, lessening of haemodialysis cramps and, most importantly, reduction in cardiovascular complications. These benefits have been seen in both human patients and in animals, including a range of renal pathologies.

The two studies reported here are examples of this. The first study is of particular significance, as it is the first to examine the impact on the crucial end points of cardiovascular complications from renal disease, including stroke.

We still have a lot to learn about which antioxidants are the most useful to give, and in what circumstances. But, there is enough published already to give clinicians with renal patients serious thought about enhancing their antioxidant status.

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