

Issue 64

In a nutshell

Anecdotal claims concerning the value of vitamin C supplementation in immune-compromised states and infection are abundant. A wealth of laboratory evidence confirms its role.

However, it has proved frustratingly difficult to go beyond laboratory measures of immune function and show consistent clinical benefits in human trials.

Vitamin C and immunity

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NUTRITION RESEARCH REVIEW

Study one: Vitamin C and HIV

Vitamin C supplementation (together with vitamin E) improves laboratory measures of immune function, but there was no effect on clinical infection rates, according to recent results from Canada.

Subjects: Forty nine HIV-positive patients.

Method: Randomised control trial in which subjects were given 3 months of either placebo or vitamin A and E supplements (vitamin E 800 IU, vitamin C 1000 mg daily).

Measures of oxidation, viral load and incidence of clinical infection were measured before and after the 3 month period.

Results: Supplemented subjects had a significant reduction in lipid peroxidation compared to controls (breath pentane $p < 0.025$, plasma lipid peroxides $p < 0.01$, malondialdehyde $p < 0.0005$).

There was a non-significant trend towards reduction in viral load (mean reduction -0.45 versus $+0.50$ log₁₀ copies/ml, $p = 0.1$, 95% CI -0.21 to -2.14). There was no significant difference in the number of infections reported.

Ref: *AIDS* 1998;12:1653-9

Study two: Vitamin C and aging immunity

Supplementation with vitamins C and E improves some aspects of immune response in older women, according to Spanish research.

Subjects: Ten healthy women and 20 women of average age 70 years with either major depression disorder or coronary heart disease.

Method: Measures of oxidation and immune function were assessed before and after supplementation for 16 weeks with vitamin C (1000 mg) and vitamin E (200 mg) daily.

Results: There was a significant increase in lymphoproliferative capacity and phagocytic functions of PMN neutrophils. There was also a significant decrease of serum levels of lipid peroxides and cortisol.

These findings were seen in both the healthy and ill subjects.

Reference: *Can J Physiol Pharmacol* 1998;76:373-80

Study three: Vitamin C and aging immunity (again!)

Subjects: Thirty elderly long-stay patients.

Method: Subjects were randomised and given 28 days of supplementation with either placebo or a combination of vitamins A, C and E.

Results: There was a significant increase in supplemented subjects in the absolute number

of T cells ($p < 0.05$) and T4 subsets ($p < 0.05$), as well as other indicators of cellular immunity such as T4: T8 ratio ($p < 0.01$) and of lymphocytes phytohaemagglutinin response ($p < 0.01$).

There were no significant changes in these parameters in the placebo group.

Ref: Ageing 1991; 20:169-74

Comments

After the promising results reported over the last two weeks, these three studies illustrate the difficulties in translating potential interest to clinical application.

None of these studies offers strong evidence of an impact of vitamin C on clinical outcome, as distinct from the ever-tantalising effects on laboratory measures of immune status.

All studies involved vitamin C together with other antioxidant nutrients.

The first study above is randomised and controlled, but its results were only significant in laboratory terms.

The second study does not appear to be placebo-controlled, but is similar to a number of other supplementation studies in elderly subjects which were. Those studies showed improvements in immune function in subjects given other nutrients (such as zinc) or multinutrient supplements (e.g. see ¹).

The third study summarised above did not report any measures of clinical status, but is notable mainly for its date of publication. Observant readers will notice this date was 1991 - most unusual in these Updates where we normally review only recent research.

The reason for this is simple. A Medline search for clinical trials involving vitamin C and clinical outcomes related to effects on immune function produces only a handful of relevant trials this decade. Few are particularly convincing.

Thus we conclude our review of clinical studies on vitamin C with some disappointment. Anecdotal claims concerning vitamin C use in immune-compromised states and in infection are abundant. But it has proved difficult to go beyond laboratory measures of immune function and show clinical outcomes.

It is not clear why this might be so - perhaps vitamin C is simply not effective in this context, or perhaps the connection between immune function and clinical outcome is so complex that it has many confounding factors.

Whatever the reason, we can only say that the subject remains open to review.

References:
1. Int J Vitam Nutr Res 1995;65:117-21

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