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Vitamin A and AIDS

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In a nutshell

Vitamin A deficiency is common in HIV infected subjects and may be linked with more rapid advance of the HIV infection.

Early human clinical supplementation trials have had mixed results. However, there is enough suggestive evidence to encourage further, longer and larger trials.

NUTRITION RESEARCH REVIEW

Study one: Vitamin A and HIV in children

High dose Vitamin A supplementation has strongly positive impact on mortality of HIV-infected children with pneumonia, according to early results from Tanzania.

Subjects: 687 children from Tanzania (aged 6/12-5 years) admitted to hospital with pneumonia, but with no obvious signs of vitamin A deficiency, Of these, 9% tested positive to HIV infection.

Method: A randomised trial in which the children received (in addition to normal pneumonia treatment) either placebo or vitamin A supplementation (400 000 IU at the beginning and repeat doses at 4 and 8 months after discharge - less for infants).

Results: There was a significant improvement in mortality in the vitamin A supplemented children, compared with placebo, seen particularly in the HIV infected children - see Table.

The Vitamin A supplemented group also had a 68% reduction in AIDS-related death (p = 0.05) and a 92% reduction in diarrhea-related deaths (p = 0.01).

Ref: Pediatr Infect Dis J 1999;18:127-33

Table: Relative risk of death from all causes: (vitamin A compared to placebo)

	All children	HIV infected	Not HIV-infected
RR (SD)	0. 51 (0.29-0.90) p=0.02	0.37 (0.14 - 0.95) p=0.04	0.58 (0.28 - 1.19) NS

Study two: Vitamin A and HIV in drug abusers

There was no short-term effect on HIV infection indicators after giving a single high dose of vitamin A to HIV-infected drug abusers, according to results from a recent American trial.

Subjects: 120 HIV-infected injecting drug abusers.

Methods: A randomised, double-blind placebo-controlled trial in which subjects were given either placebo or vitamin A supplementation (200,000 IU).

Results: There was no significant difference in HIV load or CD4 lymphocyte count at 2 and 4 weeks post-treatment.

Ref: J Infect Dis 1998;177:3 611-6

Study three: Carotene and HIV infection

Subjects: 21 HIV-infected patients.

Method: A pilot study involving 4 weeks supplementation with beta-carotene (180 mg/day).

Results: There was no change in plasma HIV RNA levels nor CD4+ lymphocyte counts.

Ref: Clin Infect Dis 1998;27:1311-3

Study four: Vitamin A and HIV infected women

Subjects: 40 HIV-infected adult women.

Method: Randomised trail involving placebo or a single dose of 300,000 IU of retinol.

Results: There was no significant change in plasma HIV-1 RNA concentration, total or sub-sets of lymphocytes, or in vitro lymphocyte proliferation to stimulus (phytohemagglutinin and Candida).

Ref: J Acquir Immune Defic Syndr Hum Retrovirol 1999;20: 44-51

Comments

Previous research has shown that Vitamin A deficiency is common in HIV infected subjects, and that this is not restricted to the developing world.

Research has also suggested that this deficiency may be linked with more rapid advance of the HIV infection (e.g. decreased CD4 cells), increased mortality and higher rates of maternal-infant HIV transmission (see for example [1, 2]).

Although cause-and-effect has not been proven, it has been thought that correction of vitamin A deficiency would have a beneficial effect on progression of HIV.

However, most of the research to date has been observational (case-control etc.) rather than intervention studies. Results such as these recent studies summarised above represent the early batch of randomised intervention trials on the subject.

The results of most of these studies are not exactly encouraging. However, it must be said that they are mostly short-term studies which focus on laboratory measures of HIV infection (such as viral load), rather than the clinical outcome.

The Tanzanian study, on the other hand, is much more promising. This is not surprising, considering that it was conducted in an area where a relatively high prevalence of both vitamin A deficiency and HIV infection could be expected. It was also conducted in children, for whom beneficial effects of vitamin A supplementation on infection-related mortality and morbidity has been well demonstrated.

Will vitamin A supplementation prove useful for adult HIV patients in the Western world?

At this stage, we simply do not know, but there is enough suggestive evidence to encourage researchers to undertake more, larger and longer-term intervention studies.

References:
1. Clin Infect Dis 1998;26:3 711-8
2. AIDS 1997;11:325-32

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