

A randomized trial of vitamin A supplements in relation to mortality among human immunodeficiency virus-infected and uninfected children in Tanzania

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Abstract

Objectives.

To determine whether vitamin A supplements result in reduced mortality among HIV-infected and uninfected children.

Design.

Randomized, double blind, placebo-controlled trial.

Methods.

Starting in April, 1993, we randomized 687 children age 6 months to 5 years who were admitted to the hospital with pneumonia. Children who were severely malnourished or had clinical signs of vitamin A deficiency were excluded. At baseline children received placebo or 400 000 IU (or half that for infants) of vitamin A, in addition to standard treatment for pneumonia. They received further doses of the same regimen 4 and 8 months after hospital discharge. Sera from children were tested for HIV antibodies by enzyme-linked immunosorbent assay and Western blot tests. For positive children <15 months of age, HIV infection was confirmed by amplified heat-denatured HIV-p24 antigen assays with confirmatory neutralization assays. HIV status was ascertained for 648 of 687 enrolled children. The mean duration of follow-up was 24.4 months (SD = 12.1).

Results.

Of 648 children 58 (9%) were HIV-infected. Compared with uninfected children, all-cause mortality was higher among HIV-infected children, as was mortality caused by pneumonia or diarrhea ($P < 0.001$ for each). Overall vitamin A supplements resulted in a 49% reduction in mortality [relative risk (RR), 0.51; 95% confidence interval (CI), 0.29 to 0.90, $P = 0.02$].

Vitamin A supplements reduced all-cause mortality by 63% among HIV-infected children (RR 0.37; CI 0.14 to 0.95, $P = 0.04$) and by 42% among uninfected children (RR 0.58, CI 0.28 to 1.19, $P = 0.14$). Vitamin A supplements were also associated with a 68% reduction in AIDS-related deaths ($P = 0.05$) and a 92% reduction in diarrhea-related deaths ($P = 0.01$).

Conclusion.

Vitamin A deficiency, which is common among children in many developing countries, is particularly severe among HIV-infected children. Our findings indicate that vitamin A supplements, a low cost intervention, reduce mortality of HIV-infected children.

Keywords

Vitamin A , supplements , mortality , human immunodeficiency virus infection , Tanzania , developing countries