Micronutrient supplementation in pregnant women with HIV infection

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In four trials in Tanzania, administration of multiple micronutrient supplements to pregnant HIV-positive women was found to improve their health and that of their offspring. Zinc supplementation had no significant beneficial effects. Selenium was associated with increased chances of survival of the offspring and reduced risk of mothers having diarrhoea. The available evidence is inadequate to determine the effect of micronutrient supplementation in pregnant women living with HIV who are being treated with antiretroviral medications.

Cochrane review

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Abstract

Micronutrient deficiencies are widespread and compound the effects of HIV disease; micronutrient supplements may be effective and safe in reducing this burden.

To assess whether micronutrient supplements are effective and safe in reducing mortality and morbidity in pregnant and lactating women with HIV infection and their infants.

The review has been updated three times since publication in 2005. In reviews prior to this update (2011), we searched the CENTRAL, EMBASE, PubMed, and GATEWAY databases to identify randomised controlled trials of micronutrient supplements using the search methods of the Cochrane HIV/AIDS Group. In the 2011 review the PubMed, EMBASE, and CENTRAL databases were searched in July 2011. As the GATEWAY database does not include conference abstracts after 2006, we also searched the AIDS-specific conference database, www.aegis.org, and contacted researchers and organisations active in the field of research to identify additional unpublished trials.

Randomised controlled trials were selected that compared the effects of micronutrient supplements (vitamins, trace elements, and combinations of these) with other supplements, placebo or no treatment on mortality, morbidity, pregnancy outcomes, immunologic indicators, and anthropometric measures in HIV-positive pregnant and lactating women. Any adverse effects of supplementation were recorded.

Two reviewer authors independently selected trials, appraised trial quality for risk of bias using standardised criteria, and extracted data using standardised forms. Where disagreements arose, a third author, acted as
One additional trial is included in this update in addition to the three trials included in the 2010 update of the initial Cochrane review. Four relatively large, well-conducted randomised controlled trials of the benefits of micronutrient supplementation have been conducted in pregnant and lactating women infected with HIV. Each of the trials evaluated a different micronutrient supplement and no direct comparisons or analyses can be made across the four trials.

The four trials were conducted between 1995 and 2006. The trials have all been conducted by the same research team in Dar es Salaam in Tanzania, in an urban setting in hospital-based antenatal clinics. Pregnant women were recruited with gestational age ranging from 12 to 27 weeks in each of the trials. Sample sizes range from 400 to 1129 with a median of 1000 participants. Three of the trials were placebo-controlled. Different interventions have been evaluated in each trial, viz.: Vitamin A versus Vitamin A and multivitamins versus Multivitamins versus placebo; Selenium versus placebo; Zinc versus placebo; and Multiple RDA multivitamins versus Single RDA multivitamins. None of the women were receiving antiretroviral therapy (ART).

Multiple micronutrient supplements conferred multiple clinical benefits to pregnant women and their offspring. No significant adverse effects were reported.

No significant clinical benefits were found from zinc supplementation of pregnant Tanzanian women.

Selenium supplements given during and after pregnancy did not delay maternal HIV disease progression or improve pregnancy outcomes, but may improve child survival and decrease maternal diarrhoeal morbidity.

There were no differences in maternal and infant outcomes when women received single RDA multivitamins or multiple RDA multivitamin supplementation.

The evidence is lacking for the effects of micronutrient supplementation given concomitantly to pregnant women already initiated on antiretroviral therapy for treatment purposes.

GRADE assessments were conducted on outcomes for each trial and included reviewing the data and the potential biases in each trial before grading the level of evidence. None of the trials were graded as providing high quality evidence primarily because there was no replication of results in other trials in other settings.

In keeping with previous World Health Organization (WHO) recommendations everything possible should be done to promote and support adequate dietary intake of micronutrients, while recognising that this may not be sufficient to correct specific micronutrient deficiencies in all HIV-infected individuals.

Specific recommendations for pregnant and lactating women infected with HIV would be to include the provision of multivitamin supplements in single RDA formulations during the antenatal period and at least for 6 weeks post-partum, especially for women who are breast-feeding.
There is no conclusive evidence to provide stand-alone zinc or selenium supplementation to HIV-infected pregnant and lactating women.

Micronutrient supplementation should not be used as a substitute for provision of recommended antiretroviral medication for preventing mother-to-child transmission of HIV and treating maternal HIV infection when this is recommended.

Further trials of single supplements are required to build the evidence base. The long-term clinical benefits, adverse effects, and optimal formulation of multiple micronutrient supplements require further investigation in pregnant women at different stages of HIV infection.

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