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[Intervention Review]

Vitamin A supplementation for reducing the risk of mother-to-child transmission of HIV infection

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ABSTRACT

Background

Observational studies of pregnant women in sub-Saharan Africa have shown that low serum vitamin A levels are associated with an increased risk of mother-to-child transmission (MTCT) of HIV. Vitamin A is cheap and easily provided through existing health services in low-income settings. It is thus important to determine the effect of routine supplementation of HIV positive pregnant women with this vitamin on the risk of MTCT of HIV, which currently results in more than 1000 new HIV infections each day world-wide.

Objectives

We aimed to assess the effect of antenatal vitamin A supplementation on the risk of MTCT of HIV as well as infant and maternal mortality and morbidity.

Search methods

In February 2008 we searched the Cochrane Library, PubMed, EMBASE, AIDSearch and GATEWAY; checked reference lists of identified articles; and contacted relevant researchers and organizations for any studies that became available after the update of this review in 2005.

Selection criteria

We selected randomised controlled trials comparing vitamin A supplementation with placebo in known HIV-infected pregnant women; irrespective of age, duration of pregnancy, clinical stage of HIV disease, or setting.

Data collection and analysis

Two authors independently assessed trial eligibility and quality and extracted data. We calculated relative risks (RR) or weighted mean differences (WMD), as appropriate, with their 95% confidence intervals (CI) for each study. We conducted meta-analysis using a fixed-effects method (when there was no statistically significant heterogeneity between study results, i.e. $P > 0.1$) or the random-effects method (when there was significant heterogeneity), and report the Higgins' statistic for all pooled effect measures.

Main results

Four trials which enrolled 3033 HIV-infected pregnant women met inclusion criteria. We found significant statistical heterogeneity between the three trials with information on MTCT of HIV ($P = 0.02$; $I^2 = 75.7\%$). Trials conducted in South Africa (632 women: RR 0.98, 95%CI 0.73 to

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1

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1.31 at 3 months) and Malawi (492 women: RR 0.84, 95%CI 0.64 to 1.11 at 24 months) did not find evidence that Vitamin A supplementation has an effect on MTCT of HIV, but the trial in Tanzania found that vitamin A supplementation increased the risk (898 women: RR 1.35, 95% CI 1.10 to 21.65 at 24 months). Overall, there was no evidence of an effect of antenatal vitamin A supplementation on the risk of MTCT of HIV (3 trials, 2022 women: RR 1.05, 95% CI 0.78 to 1.41). Similarly, a fourth trial in Zimbabwe of postpartum vitamin A supplementation (which did not meet our inclusion criteria) did not find evidence that the effect of a single maternal dose of vitamin A given within 96 hours of delivery was different from that of placebo (3351 women: RR 1.04, 95%CI 0.93 to 1.17). However, antenatal vitamin A supplementation significantly improved birth weight (3 trials with 1809 women: WMD 89.78, 95%CI 84.73 to 94.83; $I^2=33.0\%$), but there was no evidence of an effect on preterm births (3 trials, 2110 women: RR 0.88, 95%CI 0.65 to 1.19; $I^2=58.1\%$), stillbirths (4 trials, 2855 women: RR 0.99, 95%CI 0.68 to 1.43; $I^2=0\%$), deaths by 24 months (2 trials, 1635 women: RR 1.03, 95%CI 0.88 to 1.20; $I^2=0\%$), postpartum CD4 levels (1 trial, 727 women: WMD -4.00, 95% CI -51.06 to 43.06), and maternal death (1 trial, 728 women: RR 0.49, 95%CI 0.04 to 5.37).

Authors' conclusions

Currently available randomised controlled trial data do not show evidence of an effect of antenatal vitamin A supplementation on the risk of MTCT of HIV. However, given the wide confidence intervals of the pooled effect estimate (from a relative risk decrease of 22% to an increase of 41%), this review does not exclude the possibility of a beneficial or harmful effect of vitamin A supplementation on the risk of MTCT of HIV.

PLAIN LANGUAGE SUMMARY

Vitamin A supplementation for reducing the risk of mother-to-child transmission of HIV infection

Mother-to-child transmission (MTCT) of HIV is the primary way that children become infected with HIV. More than 1000 children worldwide are infected in this way every day. Researchers theorized that giving vitamin A supplements to HIV-infected pregnant women might make it less likely that their children would be infected with HIV. The primary objective of this review of randomised studies is to estimate the effect of vitamin A supplementation during pregnancy on the risk of mother-to-child transmission of HIV infection. The secondary objectives are to estimate the effect of vitamin A supplementation on infant and maternal mortality and morbidity, and to describe any side effects for the mother and the new baby.

The authors found that currently available evidence does not support the use of vitamin A supplementation of HIV-infected pregnant women to reduce MTCT of HIV, although there is an indication that vitamin A supplementation improves birth weight.