

## Micronutrients

### Effects of Vitamin A and $\beta$ -carotene Supplementation to Lactating Mothers and Their Infants in Bangladesh

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**Objective:** Assess the efficacy of vitamin A and  $\beta$ -carotene supplementation for the improvement of vitamin A status of women and their breastfed infants.

**Methodology:** Women delivering live infants in Matlab were randomized to receive either single-dose 200,000 IU of vitamin A at 2 weeks postpartum and daily placebos (n=74), daily dietary doses (n=73) of  $\beta$ -carotene (7.6 mg=1 RDA) or daily placebos for 9 months postpartum (n=73). Breastmilk vitamin A concentrations were measured at baseline, 3, 6 and 9 months postpartum. Serum retinol concentrations and modified relative-dose response (MRDR) test ratios were measured in infants and a subsample of women.

**Results:** Vitamin A supplementation to lactating mothers improved the maternal vitamin A status and breastmilk concentrations at 3 months, but the effect was not sustained. Dietary  $\beta$ -carotene significantly improved the maternal vitamin A status and breastmilk vitamin A concentrations only at 9 months. At 6 months postpartum, 25% of the women had low liver stores, and over 65% produced breastmilk with low concentrations of vitamin A. The status of 6-month old infants reflected the trend in breastmilk concentrations and was the highest in the vitamin A group, followed by the  $\beta$ -carotene and placebo groups. Of the infants of the supplemented women, over 25% had serum retinol concentrations <0.70 mmol/L, and over 85% had low liver stores of vitamin A.

**Conclusion:** Both the interventions had beneficial effects on the maternal and infant vitamin A status. However, neither was sufficient to completely overcome the subclinical vitamin A status present in these women. Both vitamin A dose and dietary  $\beta$ -carotene failed to build adequate vitamin A stores in their 6-month old infants. Mothers should be supplemented with 200,000 IU of retinol within 8 weeks postpartum, in line with the government recommendations. Additional  $\beta$ -carotene supplementation may improve vitamin A levels in mothers and their infants.

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### Subclinical Vitamin A Deficiency in Pre-school Children Living in Urban Slums of Dhaka City

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**Objective:** Assess the biochemical evidence of vitamin A deficiency in pre-school children living in the urban slums of Dhaka.