Breast-milk iodine concentration declines over the first 6 mo post-partum in iodine-deficient women


Many New Zealand women have low breast-milk iodine, putting their babies at risk of deficiency

In infants, iodine deficiency at crucial periods of development may lead to growth retardation, impaired hearing capacity and reduced cognitive function. WHO recommends that infants are exclusively breastfed until 6 mo of age. Consequently, the iodine intake of the breastfed infant relies solely on the iodine concentration of breast milk, which in turn reflects the mother's iodine status. In countries with a good supply of iodine, the breast-milk iodine concentration (BMIC) can be as high as 180 µg/L. In iodine-deficient areas, the BMIC often falls to <50 µg/L and is unlikely to supply an infant with enough iodine to meet daily requirements of 110 µg/d.

To date, no longitudinal studies have examined the iodine status of lactating mothers concurrently with their breastfed infants during the first 6 mo postpartum. The RDA for iodine of lactating women is 290 µg/d, which is based on the assumption that this intake of breast milk will provide 114 µg I/d to exclusively breastfed infants. It is unlikely that breastfeeding women living in areas of iodine deficiency could meet the RDA from dietary sources alone. The use of iodine supplements for lactating women is a simple and cost-effective strategy to increase iodine intakes. In 2006, the American Thyroid Association recommended that breastfeeding women take a supplement containing 150 µg I/d. The aims of this study were 2-fold: 1) to determine the iodine status of unsupplemented lactating women and their infants during the first 24 wk postpartum and 2) to compare the effect of 2 levels of iodine supplementation on the BMIC and iodine status in mothers and their infants.

A randomized, double-blind, placebo-controlled supplementation trial was conducted in lactating women who received placebo (n = 56), 75 µg I/d (n = 27), or 150 µg I/d (n = 26) after their infants’ birth until 24 wk postpartum. Maternal and infant urine samples and breast-milk samples were collected at 1, 2, 4, 8, 12, 16, 20, and 24 wk. Maternal serum thyrotropin and free thyroxine concentrations were measured at 24 wk.

Over 24 wk, the median urinary iodine concentration (UIC) of unsupplemented women and their infants ranged from 20 to 41 µg/L and 34 to 49 µg/L, respectively, which indicated iodine deficiency (i.e., UIC < 100 µg/L). Mean maternal UIC was 2.1–2.4 times higher in supplemented than in unsupplemented women (P < 0.001) but did not differ significantly between the 2 supplemented groups. BMIC in the placebo group decreased by 40% over 24 wk (P < 0.001) (Figure 1) and was 1.3 times and 1.7 times higher in women supplemented with 75 µg I/d (P = 0.030) and 150 µg I/d (P < 0.001), respectively, than in unsupplemented women. Thyrotropin and free thyroxine did not differ significantly between groups.

The data show that BMIC decreased in the first 6 mo in these iodine-deficient lactating women; supplementation with 75 or 150 µg I/d increased the BMIC but was insufficient to ensure adequate iodine status in women or their infants.

**Figure 1** The effect of iodine supplementation on breast-milk iodine concentration (BMIC) presented as geometric means (95% CIs) over 24 wk postpartum (placebo, n = 51; 75 µg I/d, n = 24; 150 µg I/d, n = 24).