Pregnant women in Sweden and Turkey are mildly iodine deficient despite optimal iodine intakes in school-age children

Surveys estimating iodine deficiency traditionally used the results from school-age children (SAC) as a proxy for iodine status in the general population. Recently, this approach has been challenged: children tend to consume disproportionately more iodine from milk and dairy products, and SAC are not the primary beneficiaries of iodine interventions. The primary target groups are pregnant and lactating women, whose iodine requirement increases dramatically to mainain the thyroid function of the developing fetus and then infant *(1)*.

In 2007, WHO found that the median urinary iodine concentration (UIC) among pregnant women was lower than in school-age children in several national surveys that had data for both groups. In three surveys, iodine nutrition was adequate in SAC, but inadequate in pregnant women (2). In 2011, a review of population-based surveys in SAC and pregnant women from the same year and locality concluded that adequate iodine nutrition of SAC may not reflect adequate iodine nutrition status during pregnancy *(3)*.

Turkey

Surveys in SAC across the country between 1997 and 1999 confirmed that iodine deficiency was rife. In Trabzon Province, SAC were severely iodine deficient (median UIC of 14 µg/L). Monitoring studies performed after the mandatory iodization of table salt in 2007 showed that ID had been successfully eradicated in most regions: Trabzon was defined as iodine sufficient, with a median UIC in SAC of 145 µg/L. In 2011–2012, a population-based study of pregnant women in Trabzon demostrated that, although iodine status had been rectified in SAC, pregnant women remain deficient *(4)*. In a group of 864 healthy pregnant women, who were not using iodine supplements, the median UIC was 102 µg/L (well below the optimal pregnancy range of 150–249 µg/L), and there was a significant decline as the pregnancy progressed (122 µg/L in the

1st trimester, 97 µg/L in the second and 87 µg/L in the third trimester). There was a corresponding decrease in free T3 and free T4 levels in the serum, which may partly be explained by physiological changes in thyroid hormone metabolism in pregnancy, as well as the gradual worsening of iodine status. Of the 864 women, 90.7% reported that they were using iodized salt, 3.5% reported that they were not using it, and 5.8% stated that they did not know about the importance of using iodized salt.

Sweden

In Sweden, nationwide surveys in SAC indicate that iodine nutrition is adequate: in 2006–2007, the MUIC of 857 SAC aged 6–12 years was 125 µg/L. A recent study combined the results of two cross-sectional regional surveys of iodine status in a total of 459 pregnant women in Värmland and Uppsala counties *(5)*. For the Värmland cohort, the spot urine samples were collected between January 2006 and July 2007. For the Uppsala cohort, between January 2010 and July 2012. The median UIC in the total study population, collected during the third trimester, was 98 µg/L (interquartile range 57–148 µg/L). In Sweden, nationwide iodine prophylaxis with iodized table salt was established in 1936, and iodized salt is still the main source of iodine in the Swedish diet. However, iodine fortification (40–70 mg/kg) of edible salt is voluntary. In 2012, only 27% of all salt sold in Sweden was iodized. In addition, Swedish children consume on average 485 g/day of milk and dairy products which is much higher than the mean 227 g/day consumption of adult women.

Supplementation will benefit pregnant women where iodized salt is not covering their needs

In order to assess the iodine status of pregnant women, urinary iodine excretion should be measured specifically in this group. In Europe, the available data suggests that iodine deficiency may affect as many as two-thirds of the examined pregnant populations *(6)*. Where iodization programs have been effective for at least 2 years, with salt adequately iodized and consumed by more than 90% of the population, the iodine needs of pregnant women will likely be covered by their diet, and the iodine stored in the thyroid gland will be sufficient to ensure adequate hormone synthesis and secretion. But in countries with uneven or lapsed iodized salt distribution, pregnant women should receive 100–200 µg/d of iodine containing supplements in addition to iodized salt, depending on the severity of defficiency among SAC.

References

1. Zimmermann MB. Iodine deficiency in pregnancy and the effects of maternal iodine supplementation on the offspring: a review. Am J Clin Nutr. 2009;89:668S–72S.
2. de Benoist B et al. Iodine deficiency in 2007: global progress since 2003. Food Nutr Bull 2008;29:195–202.
3. Wong et al. Comparison of median urinary iodine concentration as an indicator of iodine status among pregnant women, school-age children, and nonpregnant women. Food and Nutrition Bulletin 2011, 32(3):206-212
4. Anaforoglu I et al. Iodine status among pregnant women after mandatory salt iodisation. BJN 2016, 115:405–410
5. Granfors M, et al. Iodine deficiency in a study population of pregnant women in Sweden. AOGS 2015, 94(11):1168-74
6. Lazarus J. Iodine status in Europe in 2014. Eur Thyroid J 2014, 3:3-6