

Excessive iodine intake in Brazil

Ileana Rubi3 and **Geraldo Medeiros-Neto** ICCIDD Brazil, Thyroid Molecular Laboratory, University of Sao Paulo Medical School, Sao Paulo, Brazil.



More than two thirds of the 5 billion people living in countries affected by iodine deficiency now have access to iodized salt. In South America, iodine nutrition has considerably improved over the last decade (1). However, high iodine intake as reflected in high urinary iodine concentration (UIC) has been detected in some countries: >300 $\mu\text{g/L}$ in Brazil, and >500 $\mu\text{g/L}$ in Chile.

In Brazil, a low iodine intake was detected in the 1994-95 national survey of 20,000 schoolchildren; UIC was <100 $\mu\text{g/L}$ in more than 50% of children (2). Accordingly, in 1998, the Brazilian Health Authorities increased the fortification level of iodine in salt for human use to 40-100 mg/kg of salt. In 2001, the Thyromobil project examined 2,106 schoolchildren from 21 villages of 8 States in Brazil and reported more than 67% of the children had a UIC >300 $\mu\text{g/L}$ and 35% had values >500 $\mu\text{g/L}$ (1). This was confirmed by Duarte et al. (3) who found that 57% of examined schoolchildren ($n = 829$) in Sao Paulo State had UICs >300 $\mu\text{g/L}$. Excessive iodine intake (as reflected in a median UIC >300 $\mu\text{g/L}$ in a population) may be associated with an increased risk of



Brazil's salt iodization program needs careful monitoring to prevent children from getting too much iodine

autoimmune thyroid disease (with hypothyroidism) and also with hyperthyroidism in the elderly (with the risk of atrial fibrillation).

We have recently noted an increased incidence of chronic autoimmune thyroiditis among individuals exposed to more-than-adequate, or excessive, levels of iodine (4). In a recent population survey conducted in Brazil (Sao Paulo metropolitan area), after 5 years of excessive iodine intake by the population (1998 – 2003), 55% of the examined subjects had a UIC >300 $\mu\text{g/L}$, with a median of 306 $\mu\text{g I/L}$ (2). The prevalence of chronic autoimmune thyroiditis was 17.6% as compared to 9.4% in 1994 (2), when the population was mildly iodine deficient.

It should be noted that some of the increased incidence of Hashimoto's thyroiditis found in our recent study (4) may be due to improved diagnostic methods. In the past few years, the diagnosis of autoimmune thyroid disease, especially chronic lymphocytic thyroiditis (Hashimoto's disease), has been based on two main parameters: 1) hypoechoic ultrasound pattern that may objectively be measured by a Grey-scale analysis (5) and subjectively

evaluated by a grade 3 or 4 hypoechoic pattern (6); and 2) sera positive for anti-thyroid peroxidase (anti-TPO) antibody. A recent Chinese report (7) may have underestimated the incidence of chronic autoimmune thyroiditis by using only one of these laboratory parameters (anti-TPO antibodies) in their assessments. Use of the more powerful 2-parameter diagnostic approach by other reports in this field would contribute to more meaningful study comparisons.

In conclusion, more-than-adequate, or excessive, iodine intake may lead to autoimmune thyroiditis and hypothyroidism (4). Therefore, in iodine nutrition, the maxim "more is better" should not be a general recommendation for every country around the world.