Poland remains iodine sufficient after 20 years of IDD prevention, but pregnant women may be at risk

After the end of the Cold War, studies conducted during 1991–1996 confirmed the presence of iodine deficiency in Poland. A Thyromobil study of schoolchildren in 1992–1993 identified a high prevalence of goiter in mountainous areas: 56.6% in the Sudeten, and 39.1% in the Southeastern region (1). Only a few years previously, a Ministry of Health program to examine the effects of the Chernobyl disaster in Poland reported a high frequency of goiter in adults. As a matter of course, the Polish Council for the Control of Iodine Deficiency Disorders (PCCIDD) was set up in 1991 to follow in the footsteps of the International Council for the Control of Iodine Deficiency Disorders (ICCIDD). A subsequent screening program reported goiter in 80% of pregnant women in the municipal area of Krakow in southern Poland (2). In 1996, under the auspices of the MoH, the PCCIDD established a National Program for the Elimination of Iodine Deficiency Disorders, to monitor iodine status and develop a mandatory model of iodine prophylaxis. Today, the program includes monitoring (goiter rates in schoolchildren and pregnant women, neonate TSH, incidence rate of thyroid cancer, prevalence of iodine-induced hyperthyroidism) as well as and an education component.

The Polish model of IDD prevention
On the Council’s recommendation, in 1996 the government mandated the iodization of household salt with potassium iodide (KI) at 30±10 mg per kg, iodization of newborn formula (at 0.10–0.15 mg KI/L) for neonates and infants who are not being breastfed. The PCCIDD also recommended voluntary supplementation of pregnant and breastfeeding women at 150–200 µg KI/day as oral capsules (See Box).

Polish model of IDD prevention

1. Mandatory iodization of household salt (20–40 mg of KI/kg). Since 2002, potassium iodate may also be added (10).
2. Mandatory iodization of neonate formula (10 µg of KI/100 mL).
3. Recommended additional supplementation of pregnant and breastfeeding women with 150-200 µg KI as oral capsules.
4. Dietary guidelines recommending the consumption of iodine-rich foods.
5. Education efforts (raising awareness among pregnant women, obstetricians, and endocrinologists, among other groups) (10).
The Polish CCIDD is led by a group of experts in endocrinology, IDD prevention, and representatives of several organizations: WHO, UNICEF, the Polish Consumers’ Federation, as well as the industry. In 2008–2012, a WHO Collaborating Center for Nutrition was based at the Department of Endocrinology, Jagiellonian University School of Medicine in Krakow. In 2010, the center organized the first European Meeting of WHO Collaborating Centres for Nutrition, devoted to the current situation of iodine status and IDD prevention across Europe.

The IDD prevention measures brought about dramatic improvements in all the commonly used markers of thyroid health and iodine status. Between 1996–2001, the prevalence of goiter among 6–12 year-old schoolchildren fell from 24.5% to 4.7%, below endemic levels (Figure 1) (3), and from 80% to 19% in pregnant women (4). The frequency of serum TSH above 20 µIU/mL fell from 2.0% to 0.14%. In addition, the rising incidence of thyroid cancer plateaued, and the incidence of gastric cancer decreased. The much improved access to adequate dietary iodine at the national level resulted in decreased thyroidal uptakes of 131-I, thus becoming a protective factor in case of a nuclear accident.

The Polish model has been shown to be safe and effective (5). In 2002, at the first symposium of ICCIDD Western and Central Europe, Poland was declared as iodine sufficient at the national level. Monitoring of iodine status is supported by the Ministry of Health, and coordinated by the Department of Endocrinology at the Jagiellonian University School of Medicine.

Curbing salt consumption
Excessive dietary salt consumption is a risk factor for arterial hypertension. Complications associated with hypertension are currently the leading cause of death among those aged 60 years and over, and the second leading cause of death among 15–59 year olds. The WHO recommendation to restrict daily salt intake to 5.0 g/day/person is particularly relevant in Poland, where salt consumption is exceptionally high at around 11.5 g/day/person (including 7.0 g from household salt). Hypertension affects approximately a quarter of Poles. The Department of Endocrinology at the Jagiellonian University School of Medicine in Krakow is overseeing two initiatives with a goal to promote reduced salt intake. One is a multi-center government program to sustain the elimination of IDD achieved at the national level whilst promoting salt reduction (6). The other is a hospital-based program aiming to reduce salt consumption among the inpatients of the University Hospital in Kraków.

Other sources of iodine may play a role in populations at risk
The mandated range of iodine added to table salt was based on the current salt consumption levels in Poland, and it may no longer provide sufficient daily iodine if sodium consumption falls by more than 50% to 5 g/day. A recent collaboration with the Research Institute for Animal Production in Balice has trialed the addition of iodine to dairy cows’ mineral licks, which has increased the concentration of iodine in cow’s milk from 20–40 to 140–160 µg per liter (7). Iodine can also be found in table and mineral water with standardized concentrations of iodine (0.10–0.20 mg/L) such as the “Ustronianka z Jodem” and “Wysowianka” brands. In 2011, a new underground reservoir of iodine-rich drinking water was discovered, with iodine concentrations as high as 130 mg/dL. Technology was developed to exploit this reservoir to produce table water with 150 µg of iodide per liter, which could become an important source of additional dietary iodine for those populations who are most at risk for deficiency (school-age children, and pregnant and breastfeeding women). In 2010, a cross-sectional study of 100 pregnant women reported a median UIC of 113 µg/L, raising a concern that pregnant women in Poland may be at risk for iodine deficiency. In the same study, women who were taking iodine supplements had a significantly higher median UIC. The authors concluded that iodine supplements should be made available routinely to all Polish women during pregnancy (8). These findings are not unique in Europe, where 21 out of 31 countries with available data are currently reporting that, at a national level, pregnant women may be mildly-to-moderately iodine deficient (9). To build on the stellar success of the national IDD prevention program and sustain the elimination of IDD for another 20 years, Poland must equip the younger generations to understand the importance of dietary iodine, and continue monitoring the effects of the IDD prevention program.

References