

Abstract

Low Iodine Status in a Large Pregnancy Cohort in Ireland[†]

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Background: Iodine is an essential component of the thyroid hormones thyroxine (T₄) and triiodothyronine (T₃), which are required for brain development. Urinary iodine concentrations (UIC) and iodine intakes in the most recent National Nutrition Survey highlighted a high prevalence of low iodine status among women of child-bearing age. There are no contemporary data on iodine intake or status during pregnancy in Ireland. **Aim:** This study aims to assess iodine status in a large cohort of women during pregnancy. **Methods:** Participants were nulliparous women participating in the Improved Pregnancy Outcomes by Early Detection (IMPROvED) cohort study (<http://www.clinicaltrials.gov:ID/NCT01891240> (accessed on 8 November 2016) recruited at Cork University Maternity Hospital). Clinical and questionnaire-based assessments were carried out at 11, 15, 20, and 33 weeks of gestation. Urinary iodine concentration (UIC) at 11 and 15 weeks of gestation was quantified using the Sandell–Kolthoff (S–K) microplate colorimetric method. Statistical analysis was performed using IBM SPSS Version 28 (IBM Corp, Armonk, NY, USA). **Results:** The total sample was 1509 women having a low-risk, singleton pregnancy. The median (IQR) age and BMI were 31 (5) years and 24.5 (5) kg/m², respectively. Notably, 93% were married or in a relationship; 89% were employed; 70% had a tertiary education; 69% had an annual combined household income above 42 k; and 67% were consuming an iodine-containing supplement. At the first study visit, 8% were still smoking, and 3% were consuming alcohol. Median (IQR) UIC at 11 and 15 weeks of gestation were 129 (122) and 125 (132) µg/L, respectively ($p = 0.819$), and 60% were below the WHO population threshold for iodine sufficiency during pregnancy (150 µg/L) at both timepoints. At 15 weeks of gestation, UIC was significantly higher in iodine-containing supplement users (67%) than non-users (134 (139) µg/L vs. 109 (110) µg/L, $p = 0.002$). Supplement use was the only statistically significant determinant of UIC at 15 weeks of gestation (β (95% CI): 24 (14, 34) µg/L) after adjustment for age, ethnicity, BMI, and employment status. This first large-scale investigation of maternal iodine status in Ireland shows that most women have insufficient iodine status during early pregnancy. Further analysis will consider the influence of this risk factor on offspring's neurological development.



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