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The Lancet, [Volume 377, Issue 9782](#), Pages 2007 - 2012, 11 June 2011
doi:10.1016/S0140-6736(11)60693-4

This article can be found in the following collections: [Endocrinology \(Endocrinology-other\)](#)
Published Online: 02 June 2011

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Iodine status of UK schoolgirls: a cross-sectional survey

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Summary

Background

Iodine deficiency is the most common cause of preventable mental impairment worldwide. It is defined by WHO as mild if the population median urinary iodine excretion is 50–99 µg/L, moderate if 20–49 µg/L, and severe if less than 20 µg/L. No contemporary data are available for the UK, which has no programme of food or salt iodination. We aimed to assess the current iodine status of the UK population.

Methods

In this cross-sectional survey, we systematically assessed iodine status in schoolgirls aged 14–15 years attending secondary school in nine UK centres. Urinary iodine concentrations and tap water iodine concentrations were measured in June–July, 2009, and November–December, 2009. Ethnic origin, postcode, and a validated diet questionnaire assessing sources of iodine were recorded.

Findings

810 participants provided 737 urine samples. Data for dietary habits and iodine status were available for 664 participants. Median urinary iodine excretion was 80.1 µg/L (IQR 56.9–109.0). Urinary iodine measurements indicative of mild iodine deficiency were present in 51% (n=379) of participants, moderate deficiency in 16% (n=120), and severe deficiency in 1% (n=8). Prevalence of iodine deficiency was highest in Belfast (85%, n=135). Tap water iodine concentrations were low or undetectable and were not positively associated with urinary iodine concentrations. Multivariable general linear model analysis confirmed independent associations between low urinary iodine excretion and sampling in summer (p<0.0001), UK geographical location (p<0.0001), low intake of milk (p=0.03), and high intake of eggs (p=0.02).

Interpretation

Our findings suggest that the UK is iodine deficient. Since developing fetuses are the most susceptible to adverse effects of iodine deficiency and even mild perturbations of maternal and fetal thyroid function have an effect on neurodevelopment, these findings are of potential major public health importance. This study has drawn attention to an urgent need for a comprehensive investigation of UK iodine status and implementation of evidence-based recommendations for iodine supplementation.

Funding

Clinical Endocrinology Trust.

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