

In the UK and Australia, poor iodine intake in pregnancy predicts lower child IQ



Iodine deficiency early in life is a major cause of preventable mental impairment worldwide. Every year, in developing countries, 38 million newborns are born iodine deficient. But newborns in industrialized countries, such as the UK, USA, and Australia, are also vulnerable. As iodine deficiency has re-emerged in these countries, four recent reports have pointed to the perils of even mild deficiency during pregnancy.

1. Effect of inadequate iodine status in UK pregnant women on cognitive outcomes in their children: results from the Avon Longitudinal Study of Parents and Children. SC Bath, et al. *Lancet* 2013; published online May 22.

The authors assessed whether iodine deficiency during early pregnancy predicts child cognitive development. Mother-child pairs from a long-running prospective study in western England were analyzed. Urinary iodine concentration (UIC) was measured in stored samples from 1040 first-trimester pregnant women. Overall, the women were mild-to-moderately iodine deficient, with a median UIC of 91 $\mu\text{g/L}$ (IQR 54–143). The women were divided into two groups: iodine deficient based on a UIC $<150 \mu\text{g/g}$ creatinine or iodine sufficient (UIC $\geq 150 \mu\text{g/g}$ cr). The association between maternal iodine status and child IQ at age 8 years and reading ability at age 9 years was then assessed. After adjustment for confounders, children of deficient women were more likely to have scores in the lowest quartile for verbal IQ (60% higher risk), reading accuracy (69% higher risk) and reading comprehension (54% higher risk) than were those of sufficient mothers. The results emphasize the dangers of maternal iodine deficiency to the developing infant, even in a country classified as only mildly iodine deficient, such as the UK.

Watch videos related to the UK pregnancy study online on BBC:
<http://www.bbc.co.uk/search/news/?q=iodine>



2. Mild iodine deficiency during pregnancy is associated with reduced educational outcomes in the offspring: 9-Year Follow-up of the Gestational Iodine Cohort. KL Hynes, et al. *J Clin Endocrinol Metab* 98: 1954–1962, 2013.

Similar to the above UK study, the authors of this study from Tasmania, Australia looked at whether 9 y-old children ($n=228$) born to mothers with UICs $<150 \mu\text{g/L}$ during pregnancy have poorer educational outcomes in primary school than those whose mothers who were not iodine deficient during pregnancy.

After adjusting for potential confounders, children born to deficient mothers had reductions of 10% in spelling, 8% in grammar and 6% in English-literacy compared with children whose mothers were iodine sufficient during pregnancy. Differences in spelling remained significant after further adjustment for socioeconomic factors. The authors concluded that even mild iodine deficiency during pregnancy in Australia has long-term adverse impacts on child development.

3. Iodine status in pregnant women in the United States, NHANES 2005-2010. *K Caldwell, et al. Thyroid. 2013 Mar 14. [Epub ahead of print]*

This report presents new iodine data in the U.S. population from the U.S. National Health and Nutrition Examination Surveys (NHANES) 2009–2010, and compares it to previous NHANES studies. Median UIC in 2009–2010 (144 µg/L) for the U.S. population was significantly lower (p=0.001) than in 2007–2008 (164 µg/L). In 2009–2010, median UIC for women of childbearing age (15–44 years) was 124 µg/L. The median UIC for pregnant women in NHANES 2005–2010 was less than adequate (<150 µg/L), at 129 µg/L (Table 1). Intake of dairy products, but not salt, seafood or grains, was a positive predictor of median UIC in women of childbearing age.

Iodine intakes in the U.S. continue to fall and pregnant women are iodine deficient. And despite recommendations for supplementation by experts, iodine supplements are used by only 22% of U.S. pregnant women.

4. The prevalence of using iodine-containing supplements is low among reproductive-age women in the U.S.

JJ Gahche, et al. J Nutr. 2013 Apr 24. [Epub ahead of print]

This study estimated the prevalence of iodine-containing dietary supplement (DS) use and intakes of iodine from DSs among pregnant women and nonpregnant women of reproductive age in the U.S. NHANES 1999–2006 (n = 6404). Although 77.5% of pregnant women reported taking one or

more DSs in the past 30 d, only 22.3% consumed an iodine-containing supplement (Table 2). Pregnant women using at least one DS containing iodine had a mean daily iodine intake of 122 µg/d from supplements. Median UICs were similar for pregnant and nonpregnant women in the population aged 15–39 y: the median UIC was 148 µg/L for pregnant women and 133 µg/L for nonpregnant women. Among all women, the median UIC among nonusers of DS containing iodine was 127 µg/L, compared to 153 µg/L in women using a DS with iodine (Table 3).



Table 1: Median UICs (µg/L) for U.S. women of childbearing age and pregnant women by trimester, NHANES 2005-2010.

Category	n	Median UIC (95% CI)
Total	2233	129 (120-136)
Pregnant	206	129 (101-173)
Non-Pregnant	2027	129 (119-136)

Table 2: Prevalence of use of dietary supplements and supplemental iodine by women 15–39 y, by pregnancy status: United States, 1999–2006.

Group	n	Percentage using any dietary supplement	Percentage using any dietary supplement with iodine
All women	6404	44.4	18.7
All pregnant	1250	77.5	22.3
All nonpregnant	5154	41.3	18.5

Table 3: UICs (µg/L) in reproductive-aged women by iodine-containing supplement use in the United States, 2001–2006.

Group	n	Median (25 th , 75 th percentile)
All women	1603	134 (72, 233)
Nonusers of DS with iodine	1372	127 (68, 217)
Users of DS with iodine	231	153 (85, 299)