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Monitoring the Iodine Status of Pregnant Women in the United States

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Dear Editor:

Assuring adequate iodine nutrition is an important public health task. In this letter, we describe the iodine status of pregnant women in the United States and discuss the ability to monitor iodine status and trends. The iodine status of pregnant women in the United States has been of concern to some groups, and in October 2006, the Public Health Committee of the American Thyroid Association (ATA) recommended daily iodine supplementation during pregnancy and lactation in the United States and Canada (1). In October 2011, the ATA Taskforce on Thyroid Disease during Pregnancy and Postpartum endorsed daily oral iodine supplementation during pregnancy and lactation in North America and added women planning on becoming pregnant to this recommendation (2).

In cross-sectional surveys, the iodine status of a population is usually assessed through the analysis of casual (or spot) urine specimens for urinary iodine concentration (UIC). A single spot UIC should not be used as an indicator of an individual's iodine status, because the UIC can vary widely within an individual throughout the day and as well as day-to-day (3). König *et al.* state that to estimate an individual's iodine status requires ten repeat spot or 24-hour urine collections (3). Therefore, while a single spot urine specimen is not useful for classifying an individual's iodine status, the median urinary iodine has been used to assess the iodine status of a population. The World Health Organization (WHO) has formulated criteria to assist in interpreting median urinary iodine levels (4). For pregnant women, a median UIC of < 150 µg/L is classified as insufficient iodine intake, 150–249 µg/L as

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adequate, 250–499 µg/L as above requirements, and 500 µg/L as excessive, in terms of the amount of iodine required to prevent iodine deficiency.

Iodine status in the United States has been assessed in the National Health and Nutrition Examination Survey (NHANES), a stratified multistage survey that provides a representative sample of the noninstitutionalized US population (5). UIC was measured in NHANES I (1971–75), III (1988–94), and in 2-year cycles of continuous NHANES beginning in 2001–2002 (6–10). The number of women and estimates of median UIC presented here may differ slightly from some previous publications because of exclusion criteria; we did not restrict the age of pregnant women, and we excluded women with a current thyroid condition. The median UIC by NHANES is presented in the Supplementary Data (available online at www.liebertonline.com/thy). In NHANES I, the median UIC among pregnant women was above requirements and in subsequent surveys remained relatively stable with a median UIC around the adequate/insufficient UIC cutoff value of 150 µg/L. In NHANES 2001–2002 and 2003–2004, pregnant women would be classified as having adequate iodine intake, and in NHANES III, 2005–2006, and 2007–2010 (4 years combined due to small sample size), as having inadequate iodine intake. Note that the median urinary iodine criteria specific for pregnant women were first published by the WHO in 2007 (4). As mentioned previously, in October 2006, the ATA recommended iodine supplementation during pregnancy and lactation in the United States and Canada (1). In continuous NHANES analyses subsequent to that recommendation (2007–2010), there has been no significant change in the median UIC among pregnant women. In other studies conducted since the mid-1990s among pregnant women in Atlanta, Boston, and Los Angeles, the median UIC has been < 150 µg/L (11–13). There are subgroups of pregnant women with much lower median UIC levels, such as those not consuming dairy products, an important source of iodine in the United States (10).

The presentation of 2-year estimates from continuous NHANES should be interpreted cautiously because of a small number of clusters in each 2-year survey cycle and, with pregnant women, a small sample size (Supplementary Data). This imprecision is reflected in the confidence interval widths for the continuous NHANES for each 2-year cycle. However, we believe that presenting 2-year cycles can be instructive. As presented in the Supplementary Data, for some NHANES, pregnant women were oversampled, and the sampling of urine specimens tested for UIC has varied. Starting in NHANES 2007–2008, pregnant women were not over-sampled, resulting in a smaller sample size; however, in that survey, 100% of urine samples were tested for UIC ($n = 54$). In NHANES 2009–2010, pregnant women were again not oversampled, and the UIC sampling was based on a random sample of 1/3 of urine specimens, resulting in only 21 pregnant women with UIC results. This small number of pregnant women with UIC results limits the ability to monitor this group with precision. The current plans for continuous NHANES are to not oversample pregnant women, and 1/3 of urine samples will be tested for UIC for 2011–12.

In conclusion, recent data indicate that the iodine status of pregnant women in the United States, based on the WHO criteria, may be insufficient. However, the ability to monitor the iodine status in this group using NHANES is limited because of the current sampling scheme for pregnant women and for testing urine specimens for UIC. Given the critical role

of iodine nutrition in fetal development, consideration should be given to mechanisms for allowing continued monitoring of the iodine status of pregnant women.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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