Commentary

IS IODINE DEFICIENCY REEMERGING IN THE UNITED STATES?

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Abbreviation:
IDD = iodine deficiency disorder

Iodine is required for thyroid hormone synthesis. Inadequate iodine intake is associated with a spectrum of adverse consequences known as iodine deficiency disorders (IDDs). Goiter and hypothyroidism can result from iodine deficiency at all life stages. Iodine-deficient pregnant women are at increased risk for obstetric complications (1). Because iodine nutrition is critical for fetal neurodevelopment, even mild maternal iodine deficiency has been associated with decreases in child intelligence quotient.

The case report by Chow and colleagues (2) in this issue of *AACE Clinical Case Reports* describes 4 New Jersey women who were recently diagnosed with probable iodine-deficiency goiter. The presence of patients in the U.S. with iodine deficiency is not entirely surprising. A century ago, much of the U.S. was iodine deficient and goiter was endemic, especially around the Great Lakes. Iodized salt, introduced in the 1920s, eliminated the U.S. "goiter belt," and since the 1940s, the U.S. overall has been considered iodine sufficient. However, U.S. dietary iodine intakes have decreased by 50% since the 1970s, and recently, mild iodine deficiency has reemerged in some population groups.

How could this happen? Salt iodization, the mainstay of global IDD prevention efforts, has never been mandated in the U.S. Many consumers opt to purchase noniodized salt, which includes most kosher and sea salt. Salt consumption has declined due to concerns about cardiovascular risk. In addition, the vast majority of salt ingested in the U.S. is from commercially processed foods, which almost universally contain noniodized salt. Currently, the major U.S. source of dietary iodine is dairy foods. Iodine is added to cow's milk not as a public health measure but through supplementation of cattle feed and the use of iodophor cleansers by the dairy industry. Vegans, individuals with real or perceived lactose deficiency, and others in the U.S. with minimal or no dairy intake are at risk for iodine deficiency. The patients described by Chow and colleagues all reported low dairy intake.

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The iodine intake of children in the U.S. is more than adequate. However, national and regional surveys over the past several years have consistently noted mild iodine deficiency in pregnant women. This may be due to the increased iodine requirements in pregnancy (220 μg daily, rather than the 150 μg of iodine required daily by nonpregnant adults [1]). Among U.S. women of childbearing age, non-Hispanic black women and those with higher education levels appear to be at highest risk for low iodine intake, for unclear reasons (3).

How should U.S. clinicians manage patients at risk for IDD? The best strategy is prevention. The American Association of Clinical Endocrinologists and other societies currently recommend that U.S. women who are pregnant, lactating, or planning a pregnancy should ingest a daily supplement containing 150 μg of iodine. Patients need to actively seek out such supplements because half of prenatal multivitamin preparations marketed in this country contain no iodine (4). Although increasing sodium

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intake cannot be recommended, patients who already add table salt to their food are best advised to make sure they are using iodized salt.

Once IDD manifestations have developed, clinical management is challenging, largely because there is no validated biomarker or U.S. dietary questionnaire that allows for definitive diagnosis. Although median urinary iodine concentrations can be used to assess the iodine status of populations, 10 to 12 spot or 24-hour urine iodine concentration measurements are required in order to identify an individual's iodine status with reasonable precision (5). If IDD is suspected based on patient history, iodine must be repleted cautiously. Iodine doses >150 μg daily are not recommended due to the risk for inducing thyroid dysfunction in susceptible individuals, such as those with Hashimoto's thyroiditis or autonomous nodular goiter (6).

What can be done to reverse the reemergence of IDD in the U.S.? Ongoing monitoring of population urinary iodine concentrations, as is being done by the National Health and Nutrition Examination Survey, is essential. Monitoring of iodine sources in the food supply is also critically important. Ideally, it will ultimately be feasible to increase the use of iodized salt in processed foods or to fortify selected foods with iodine in order to ensure adequate intakes across all population groups.

DISCLOSURE

The author has no multiplicity of interest to disclose.

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