Measuring Urinary Iodine in the U.S. Population

Public Health Problem

- Iodine deficiency disorder (IDD) is a well-documented global health problem, affecting more than a billion people worldwide.
- Among the consequences of IDD are goiter, cretinism, intellectual impairment, stillbirth, spontaneous abortion, and increased perinatal mortality.
- Although substantial progress has been made in eliminating IDD, there are indications that urinary iodine levels may be declining in the U.S. population.
- Urinary iodine analysis is the recommended and most common method used to assess iodine status, but currently no "gold standard" exists for comparing results among laboratories.

CDC Laboratory Response

CDC scientist maintains proficiency in the routine manual methods used to determine urinary iodine levels.

CDC's urinary iodine reference method was developed on this state-of-the-art instrument, an inductively coupled plasma mass spectrometer (ICP-MS).

- Using state-of-the-art technology, CDC measures urinary iodine in samples obtained from participants in the National Health and Nutrition Examination Survey (NHANES), a national survey of the civilian, noninstitutionalized population.
- The laboratory maintains methods that are similar to those used to measure urinary iodine in laboratories worldwide in order to provide technical assistance to other laboratories.
- In coordination with CDC's Global Micronutrient Laboratory Program, CDC established the Ensuring the Quality of Iodine Procedures (EQUIP) program in January 2001. EQUIP provides laboratories with an independent assessment of their performance in analyzing urinary iodine. Currently, 4 U.S. and 37 international laboratories participate in the program.

- Other important contributions that CDC scientists have made include the following:

  - Developed urine reference materials and a reference method for analyzing urinary iodine.
  - Analyzed specimens obtained from NHANES 2000 and NHANES 2001 for urinary iodine levels.
  - Evaluated and optimized multiple laboratory methods for assessing iodine status.
  - Conducted an international interlaboratory comparison study for urinary iodine with 28 laboratories.
  - In collaboration with UNICEF, WHO, and nongovernmental organizations, held a seminar and workshop in Bangkok, Thailand, on establishing an international iodine laboratory network.

Public Health Impact

The EQUIP program will eliminate bias and precision problems within the assay system and will confirm the quality of analyses performed by participating laboratories, thus increasing the level of confidence that laboratories have in their analytical work. Worldwide progress toward eliminating IDD through the universal iodization of salt has been substantial. However, ensuring that laboratories maintain high-quality analyses is essential because results are used to direct government policies about salt iodization.

Future Plans

- CDC scientists will analyze NHANES data from the most current survey, which will provide vital information about the iodine status of the U.S. population.
- CDC will also evaluate the use of inexpensive and low-technology methods for assessing iodine status in people and will evaluate the iodine content of salt, especially for use in developing and less-developed countries.

Questions or Comments

http://www2.cdc.gov/nceh/contactnceh/frmSubmit.asp

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.

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