CLINICAL **THYROIDOLOGY** FOR THE **PUBLIC**

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IODINE DEFICIENCY

Thyroglobulin blood testing in adults can be used as a population measure of adequate iodine nutrition

BACKGROUND

Iodine is a common micronutrient from the diet. It is important for the normal functioning of thyroid hormones, which are vital for brain development in infants. However, a person's individual iodine status cannot be determined, since there are significant changes each day. Instead, the iodine status of a group of people is determined, which is important for monitoring if certain populations have too little or too much iodine intake (too much iodine intake can also be harmful to the thyroid).

One method of monitoring the iodine status of a population group is measuring iodine levels in the urine, but the collection of urine may be challenging in some situations. Another method of assessing iodine status of a group of people is the measurement of thyroglobulin, a protein made by the thyroid gland, from blood testing. Higher thyroglobulin levels suggest that the thyroid is working harder to compensate for low iodine levels and may be an indication of iodine deficiency. In contrast, lower thyroglobulin levels show that the thyroid is compensating less and thus corresponds to adequate/improved iodine nutrition. Only a drop of blood is needed and can be dried on a filter paper for testing, which may be easier than the urine testing. In children, blood thyroglobulin levels are routinely used to monitor the iodine status on the population level. This study was done to see if blood thyroglobulin levels can also be used to monitor the iodine status of a population among adults.

THE FULL ARTICLE TITLE

Feei Ma Z et al. Iodine supplementation of mildly iodine deficient adults lowers thyroglobulin: a randomized controlled trial. J Clin Endocrinol Metab. 2016 Feb 18:jc20153591. [Epub ahead of print]

SUMMARY OF THE STUDY

This study was of 112 adults between the ages of 18-40 in New Zealand who were asked to take either iodine tablets (as 150 mcg of potassium iodide) or placebo (sugar) pills daily for 24 weeks. All adults who were included were screened and confirmed to have mildly low iodine levels in the urine to begin with. All participants provided urine and blood sample before, during, and at the end of the study period. The urine was measured for iodine, and the blood was measured for thyroglobulin. The blood was also measured for the thyroid hormones in order to assess thyroid function.

In the group who were given the iodine supplement, their iodine levels in the urine had more than doubled (from 79 mcg/L to 178 mcg/L) by the end of the 24 week period. Among the group who took the placebo pills, there was essentially no change in the urine iodine levels. Correspondingly, when compared to the placebo group, the iodine-supplemented group also had blood thyroglobulin levels decrease by 12% at 8 weeks, 20% by 16 weeks, and 27% by the end of the study at 24 weeks. This decreasing trend in blood thyroglobulin levels confirms that the iodine supplementation improved the iodine deficiency (as also confirmed by the increased urine iodine levels) over the study period.

Neither of the two groups had any abnormalities or significant changes in the thyroid hormone levels in the blood, which are not surprising, as they reflect changes in iodine status over a much longer timeframe.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study in adults confirms the trend in children that improved iodine nutrition is able to decrease blood thyroglobulin levels. Thus, blood thyroglobulin levels may be a potential way to monitor iodine status in large populations of adults. This is important in areas of the world in which there is insufficient iodine naturally in the diet, particularly in women of childbearing age as a way to safeguard against brain damage in infants and young children.

— Angela M. Leung, MD, MSc

ATA THYROID BROCHURE LINKS

Iodine Deficiency: http://www.thyroid.org/iodine-deficiency

IODINE DEFICIENCY, continued

ABBREVIATIONS & DEFINITIONS

Iodine: An element found naturally in various foods that is important for making thyroid hormones and for normal thyroid function. Common foods high in iodine include iodized salt, dairy products, seafood, and some breads.

Thyroglobulin: A protein made only by thyroid cells. Lower thyroglobulin levels show that the thyroid is compensating less and thus corresponds to adequate or improved iodine nutrition.