



## HYPOTHYROIDISM

### Is fluoridated drinking water associated with a higher prevalence of hypothyroidism?

#### BACKGROUND

Fluoride is an element that has anti-tooth decay properties. Fluoridation of the water supply is an important public health intervention that has been shown to reduce the rate of tooth decay and dental carries. Drinking water fluoridation at a level between 0.7-1.2 mg/L is widely practiced in the United States and 10% of the population in the United Kingdom is exposed to water fluoridated at about 1 mg/L. Despite the dental benefits, water fluoridation has been a controversial subject over the years. Prominent in the arguments against fluoridation are the effects of fluoride on the thyroid due to some shared properties with iodine. High fluoride exposure (markedly greater than in the water supply) has been associated with hypothyroidism, especially in the setting of iodine deficiency. The aim of this study was to examine whether the prevalence of hypothyroidism differs between fluoridated and non-fluoridated geographical regions in the United Kingdom.

#### THE FULL ARTICLE TITLE

Peckham S, Lowery D, Spencer S. Are fluoride levels in drinking water associated with hypothyroidism prevalence in England? A large observational study of GP practice data and fluoride levels in drinking water. *J Epidemiol Community Health*. February 24, 2015 [Epub ahead of print].

#### SUMMARY OF THE STUDY

The authors studied data from 7935 general practices across the United Kingdom between 2012-2013. They were easily able to identify patients with hypothyroidism within each practice because in the U.K. annual testing of thyroid function is required for those with hypothyroidism by primary care physicians. Patient data was collected

within each practice and included TSH levels and average and maximum water fluoride concentrations. They then used the water fluoride concentrations to try to predict the risk of hypothyroidism within the practice.

The prevalence of hypothyroidism for all practices was ~3%. The odds of a high level of hypothyroidism within a practice was 1.37 times higher in areas with drinking-water fluoride levels of 0.3 to 0.7 mg/L than in those with fluoride levels less than 0.3 mg/L. In addition, the odds of having a high prevalence of hypothyroidism was nearly twice as high in the West Midlands (which as fluoridated drinking water) compared to Greater Manchester (which does not have fluoridated drinking water).

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

These data suggest that people residing in regions with drinking-water fluoridation have a higher risk of developing hypothyroidism than those living in regions without drinking-water fluoridation. The authors feel that these results raise concerns about the safety of community drinking-water fluoridation. However, others are skeptical of this conclusion and highlight significant limitations in the methodology used in this study, as well as the fact that these results are not consistent with previously published literature. Thus, more study is needed to determine if low levels of fluoride in drinking water can affect thyroid function.

— Philip Segal, MD

#### ATA THYROID BROCHURE LINKS

Hypothyroidism: <http://www.thyroid.org/what-is-hypothyroidism>

#### ABBREVIATIONS & DEFINITIONS

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

**Fluoride:** an element with powerful anti-tooth decay properties. Fluoride also shares some similar properties to iodine.