HYPOTHYROIDISM AND FLUORIDE-INDUCED DEVELOPMENT DISORDERS FOLLOWING MATERNAL EXPOSURE TO COMMUNITY WATER FLUORIDATION

ABSTRACT: The recent finding that the exposure of pregnant women to optimally fluoridated water may result in an increased risk of hypothyroidism and that this may be one mechanism underlying the previously found association between fluoride exposure in pregnancy and reduced offspring IQ gives support to the hypothesis that hypothyroidism may also be one of the mechanisms for the occurrence of the other fluoride-induced development disorders (FIDDs) of short stature, bone deformities, delayed dental eruption, and dental fluorosis. When the small reduction in dental caries associated with fluoridated water is seen in the context of delayed dental eruption due to hypothyroidism, so that the teeth have a shorter time in the decay-inducing oral environment, and that this comes at the cost of fluoride-induced cognitive impairment, the risk benefit ratio for community water fluoridation takes on a different complexion.

Keywords: Community water fluoridation; Fluoride-induced developmental disorders; Hypothyroidism; IQ.

A recent study by Hall et al. investigated, for the first time, the relationships between maternal fluoride exposure and thyroid function in a prospective pregnancy cohort receiving optimally fluoridated water.[1] Their findings indicated that higher levels of fluoride exposure in pregnant women were associated with an increased risk of hypothyroidism, supporting the hypothesis that fluoride exposure may disrupt thyroid function. Thyroid dysfunction in pregnancy may be one mechanism underlying the previously found association between fluoride exposure in pregnancy and offspring Full Scale Intelligence Quotient (FSIQ) in the Maternal Infant Research on Environmental Chemicals (MIREC) cohort, particularly among women with male children.[2] They considered that their findings are of public health significance given the large number of people exposed to fluoride in drinking water and the vital role of thyroid hormones in neurodevelopment.

The finding that hypothyroidism may be one of the mechanisms leading to the fluoride-induced developmental disorder (FIDD) of cognitive impairment gives support to the hypothesis that hypothyroidism may also be one of the mechanisms for the occurrence of the other FIDDs of short stature, bone deformities, delayed dental eruption, and dental fluorosis.[3] All of these FIDDs occur with both hypothyroidism and with exposure to fluoride.[3] When the small reduction in dental caries associated with fluoridated water is seen in the context of delayed dental eruption due to hypothyroidism so that the teeth have a shorter time in the decay-inducing oral environment and that this comes at the cost of fluoride-induced cognitive impairment, the risk benefit ratio for community water fluoridation takes on a different complexion.

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