

# New study associates excess maternal iodine supplementation with congenital hypothyroidism

26 July 2012

Congenital hypothyroidism is thyroid hormone deficiency at birth that, if left untreated, can lead to neurocognitive impairments in infants and children. Although the World Health Organization recommends 200-300 µg of iodine daily during pregnancy for normal fetal thyroid hormone production and neurocognitive development, the US Institute of Medicine considers 1,100 µg to be the safe upper limit for daily ingestion. A case series scheduled for publication in *The Journal of Pediatrics* describes three infants who developed congenital hypothyroidism as a result of excess maternal iodine supplementation.

Kara Connelly, MD, and colleagues from Oregon Health & Science University, Doernbecher Children's Hospital, Boston University School of Medicine, State of Oregon Public Health Laboratory, and Randall Children's Hospital at Legacy Emanuel describe three [infants](#) with congenital hypothyroidism whose mothers had taken 12.5 mg of [iodine](#) daily, 11 times more than the safe upper limit, while pregnant and/or breastfeeding. Iodine is transferred from the mother to the infant through the placenta or breast milk. The three infants had blood iodine levels 10 times higher than healthy control infants (measured from newborn screening filter paper).

Excess iodine causes the [thyroid](#) to temporarily decrease function to protect against hyperthyroidism (Wolff-Chaikoff effect). Adults and older children are able to "escape" from this effect after several days of excess iodine to avoid hypothyroidism. However, the immature thyroid glands of fetuses and newborns have not developed this protective effect and are more susceptible to iodine-induced hypothyroidism. Although infants recover normal thyroid function after acute iodine exposure (e.g., a few days of topical iodine application), continuous excessive

iodine exposure to the fetal and neonatal thyroid gland may cause long-term harmful effects on thyroid function.

Sources of iodine include [nutritional supplements](#), prenatal vitamins, and seaweed (kelp). According to Dr. Connelly, "The use of iodine-containing supplements in pregnancy and while breastfeeding is recommended in the United States. However, these cases demonstrate the potential hazard of exceeding the safe upper limit for daily ingestion." Excess iodine ingestion from supplementation is often unrecognized because it is not routine practice to ask mothers of infants with congenital [hypothyroidism](#) about nutritional supplements taken during pregnancy. Pregnant or breastfeeding women should discuss the safe dosages of nutritional supplements with their doctors prior to including them in their daily regimen.

**More information:** "Congenital Hypothyroidism Caused by Excess Prenatal Maternal Iodine Ingestion" by Kara Connelly, MD, Bruce Boston, MD, Elizabeth Pearce, MD, David Sesser, David Snyder, MD, Lewis Braverman, MD, Sam Pino, Stephen LaFranchi, MD, appears in *The Journal of Pediatrics*, [DOI 10.1016/j.jpeds.2012.05.057](https://doi.org/10.1016/j.jpeds.2012.05.057)

Provided by Elsevier

APA citation: New study associates excess maternal iodine supplementation with congenital hypothyroidism (2012, July 26) retrieved 26 July 2022 from <https://medicalxpress.com/news/2012-07-associates-excess-maternal-iodine-supplementation.html>

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