

Maternal thyroid function during pregnancy or neonatal thyroid function and attention deficit hyperactivity disorder: A systematic review

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Abstract

BACKGROUND:

Attention Deficit Hyperactivity Disorder (ADHD) is the most common neurobehavioral disorder in children, yet its etiology is poorly understood. Early thyroid hormone disruption may contribute to the development of ADHD. Disrupted maternal thyroid hormone function has been associated with adverse neurodevelopmental outcomes in children. Among newborns, early-treated congenital hypothyroidism has been consistently associated with later cognitive deficits.

METHODS:

We systematically reviewed literature on the association between maternal or neonatal thyroid hormones and ADHD diagnosis or symptoms. We searched Embase, Pubmed, Cinahl, PsycInfo, ERIC, Medline, Scopus, and Web of Science for articles published or available ahead of print as of April 2018.

RESULTS:

We identified 28 eligible articles: 16 studies of maternal thyroid hormones, seven studies of early-treated congenital hypothyroidism, and five studies of neonatal thyroid hormones. The studies provide moderate evidence for an association between maternal thyroid hormone levels and offspring ADHD, some evidence for an association between early-treated congenital hypothyroidism and ADHD, and little evidence for an association between neonatal thyroid hormone levels and later ADHD.

CONCLUSIONS:

The reviewed articles suggest an association between maternal thyroid function and ADHD, and possibly between early-treated congenital hypothyroidism and ADHD. Study limitations, however, weaken the conclusions in our systematic review, underlining the need for more research. Importantly, there was much variation in measurement of thyroid hormone function and of ADHD symptoms. Recommendations for future research include using population-based designs, attending to measurement issues for thyroid hormones and ADHD, considering biologically relevant covariates (e.g., iodine intake), and assessing non-linear dose-responses.