

## Anti-Thyroid Drugs May be at Higher Risk for Perinatal Thyroid Disease

Ahmed RG\*

Division of Anatomy and Embryology, Zoology Department, Faculty of Science, Beni-Suef University, Beni-Suef, Egypt

\*Corresponding Author: Ahmed RG, Division of Anatomy and Embryology, Zoology Department, Faculty of Science, Beni-Suef University, Beni-Suef, Egypt.

Received: August 26, 2017; Published: September 15, 2017

Thyroid hormones (THs) regulate the perinatal development [1-30]. Anti-thyroid/thioureylene drugs [thiourea, methimazole (MMI), carbimazole (CMI), or propylthiouracil (PTU)] can be used in the treatment of hyperthyroidism [14,31]. However, they can perturb the synthesis of THs and fetal/neonatal development [14]. These dysfunctions associated with several neurological and behavior abnormalities [32,33]. Additional studies stated that PTU [19,25,34], MMI [15,16] or CMI [29] during the development can disturb the THs levels and postnatal growth, and cause several brain deficits, even at maternal low doses [35]. These disorders resulting from the ability of these drugs to inhibit the activities of peripheral deiodinases and thyroperoxidase (TPO) [36]. These dysfunctions might depend on the experimental duration, dose, and developmental period.

### Conflict of Interest

The author declares that no competing financial interests exist.

### Bibliography

1. El-bakry AM., et al. "Comparative study of the effects of experimentally-induced hypothyroidism and hyperthyroidism in some brain regions in albino rats". *International Journal of Developmental Neuroscience* 28.5 (2010): 371-389.
2. Ahmed RG. "Perinatal 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin exposure alters developmental neuroendocrine system". *Food and Chemical Toxicology* 49.6 (2011): 1276-1284.
3. Ahmed RG. "Maternal-newborn thyroid dysfunction". In the Developmental Neuroendocrinology. Ed R.G. Ahmed. Germany: LAP LAMBERT Academic Publishing GmbH & Co KG (2012a): 1-369.
4. Ahmed RG. "Maternal-Fetal Thyroid Interactions, Thyroid Hormone". Dr. N.K. Agrawal (Ed.), In Tech Open Access Publisher, Chapter 5 (2012b): 125-156.
5. Ahmed RG. "Early weaning PCB 95 exposure alters the neonatal endocrine system: thyroid adipokine dysfunction". *Journal of Endocrinology* 219.3 (2013): 205-215.
6. Ahmed RG., et al. "Lactating PTU exposure: II- Alters thyroid-axis and prooxidant-antioxidant balance in neonatal cerebellum". *International Research Journal of Natural Sciences* 2.1 (2014): 1-20.
7. Ahmed RG. "Chapter 1: Hypothyroidism and brain development". In Advances in Hypothyroidism Treatment. Avid Science Borsigstr. 9, 10115 Berlin, Berlin, Germany. Avid Science Publications level 6, Melange Towers, Wing a, Hitec City, Hyderabad, Telangana, India (2015a): 1-40.
8. Ahmed RG. "Hypothyroidism and brain developmental players". *Thyroid Research* 8 (2015b): 2.

---

**Citation:** Ahmed RG. "Anti-Thyroid Drugs May be at Higher Risk for Perinatal Thyroid Disease". *EC Pharmacology and Toxicology* 4.4 (2017): 140-142.

9. Ahmed RG. "Maternofetal thyroid action and brain development". *Journal of Advances in Biology* 7.1 (2015c): 1207-1213.
10. Ahmed RG. "Gestational dexamethasone alters fetal neuroendocrine axis". *Toxicology Letters* 258 (2016a): 46-54.
11. Ahmed RG. "Neonatal polychlorinated biphenyls-induced endocrine dysfunction". *Annals of Thyroid Research* 2.1 (2016b): 34-35.
12. Ahmed RG. "Maternal iodine deficiency and brain disorders". *Endocrinology and Metabolic Syndrome* 5 (2016c): 223.
13. Ahmed RG. "Maternal bisphenol A alters fetal endocrine system: Thyroid adipokine dysfunction". *Food and Chemical Toxicology* 95 (2016d): 168-174.
14. Ahmed OM., et al. "Thyroid hormones states and brain development interactions". *International Journal of Developmental Neuroscience* 26.2 (2008): 147-209.
15. Ahmed OM., et al. "Effects of experimentally induced maternal hypothyroidism and hyperthyroidism on the development of rat offspring: I- The development of the thyroid hormones-neurotransmitters and adenosinergic system interactions". *International Journal of Developmental Neuroscience* 28.6 (2010): 437-454.
16. Ahmed OM., et al. "Effects of experimentally induced maternal hypothyroidism and hyperthyroidism on the development of rat offspring: II-The developmental pattern of neurons in relation to oxidative stress and antioxidant defense system". *International Journal of Developmental Neuroscience* 30.6 (2012): 517-537.
17. Ahmed RG., et al. "The developmental and physiological interactions between free radicals and antioxidant: Effect of environmental pollutants". *Journal of Natural Sciences Research* 3.13 (2013a): 74-110.
18. Ahmed RG., et al. "Nongenomic actions of thyroid hormones: from basic research to clinical applications. An update". *Immunology, Endocrine and Metabolic Agents in Medicinal Chemistry* 13.1 (2013b): 46-59.
19. Ahmed RG. "Editorial: Do PCBs modify the thyroid-adipokine axis during development?" *Annals of Thyroid Research* 1.1 (2014): 11-12.
20. Ahmed RG., et al. "Immune stimulation improves endocrine and neural fetal outcomes in a model of maternofetal thyrotoxicosis". *International Immunopharmacology* 29.2 (2015a): 714-721.
21. Ahmed RG., et al. "Protective effects of GM-CSF in experimental neonatal hypothyroidism". *International Immunopharmacology* 29.2 (2015b): 538-543.
22. Ahmed OM and Ahmed RG. "Hypothyroidism". In A New Look At Hypothyroidism. Dr. D. Springer (Ed.), In Tech Open Access Publisher, Chapter 1 (2012): 1-20.
23. Ahmed RG and Incerpi S. "Gestational doxorubicin alters fetal thyroid-brain axis". *International Journal of Developmental Neuroscience* 31.2 (2013): 96-104.
24. Van Herck SLJ., et al. "Maternal transfer of methimazole and effects on thyroid hormone availability in embryonic tissues". *Endocrinology* 218.1 (2013): 105-115.
25. Ahmed RG and El-Gareib AW. "Lactating PTU exposure: I- Alters thyroid-neural axis in neonatal cerebellum". *European Journal of Biology and Medical Science Research* 2.1 (2014): 1-16.

26. Incerpi S., et al. "Thyroid hormone inhibition in L6 myoblasts of IGF-I-mediated glucose uptake and proliferation: new roles for integrin  $\alpha v\beta 3$ ". *American Journal of Physiology - Cell Physiology* 307.2 (2014): C150-C161.
27. Candelotti E., et al. "Thyroid hormones crosstalk with growth factors: Old facts and new hypotheses". *Immunology, Endocrine and Metabolic Agents in Medicinal Chemistry* 15.1 (2015): 71-85.
28. De Vito P., et al. "Role of thyroid hormones in insulin resistance and diabetes". *Immunology, Endocrine and Metabolic Agents in Medicinal Chemistry* 15.1 (2015): 86-93.
29. El-Ghareeb AA., et al. "Effects of zinc supplementation in neonatal hypothyroidism and cerebellar distortion induced by maternal carbimazole". *Asian Journal of Applied Sciences* 4.4 (2016): 1030-1040.
30. Ahmed RG and El-Gareib AW. "Maternal carbamazepine alters fetal neuroendocrine-cytokines axis". *Toxicology* 382 (2017): 59-66.
31. Sunil K., et al. "Carbimazole induced cholestatic hepatitis in Graves disease". *Indian Journal of Endocrinology and Metabolism* 17.2 (2013): 326-328.
32. Pilhatsch M., et al. "Hypothyroidism and mood disorders: integrating novel insights from brain imaging techniques". *Thyroid Research* 4.1 (2011): S3.
33. Cortes C., et al. "Hypothyroidism in the adult rat causes incremental changes in the brain- derived neurotrophic factor, neuronal and astrocyte apoptosis, gliosis, and deterioration of postsynaptic density". *Thyroid* 22.9 (2012): 951-963.
34. Koohestani F., et al. "Differential effects of developmental hypo- and hyperthyroidism on acetylcholinesterase and butyryl cholinesterase activity in the spinal cord of developing postnatal rat pups". *International Journal of Developmental Neuroscience* 30.7 (2012): 570-577.
35. Chakraborty G., et al. "Reduced hippocampal brain-derived neurotrophic factor (BDNF) in neonatal rats after prenatal exposure to propylthiouracil (PTU)". *Journal of Endocrinology* 153.3 (2012): 1311-1316.
36. Zoeller RT and Crofton KM. "Mode of action: Developmental thyroid hormone insufficiency-neurological abnormalities resulting from exposure to propylthiouracil". *Critical Reviews in Toxicology* 35.8-9 (2005): 771-781.

**Volume 4 Issue 4 September 2017**

**© All rights reserved by Ahmed RG.**