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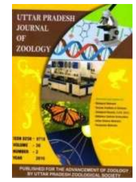

# MATERNAL HYPOTHYROIDISM AND GESTATIONAL OBSTACLES

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The sole author designed, analyzed and interpreted and prepared the manuscript.

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***Commentary***

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The developing embryo, fetus and neonates are reliant on the maternal quantity of thyroid hormones (THs) [1-20]. On the other hand, gestational hypothyroidism is the utmost common endocrine dysfunctions [21-23]. Also, thyroid deficiency is very common in women [24,25]. The elevation in the level of thyroid-stimulating hormone (TSH) during the first trimester of pregnancy can increase the frequency of miscarriage and perinatal loss [26]. In iodine-sufficient areas, the elevation in the concentration of thyroglobulin antibody (Tg-Ab+) or thyroid peroxidase antibody (TPO-Ab+) in pregnant women can cause chronic autoimmune thyroiditis and then gestational hypothyroidism [27,28], and vary the fetal thyroid activities [25,29]. Another cause of gestational hypothyroidism is the disruption in the activity of thyroid peroxidase (TPO), heme-containing enzyme (essential for TH synthesis) causing iron deficiency [30]. Thyroid antibodies during gestation with the euthyroid state (normal thyroid activity) can also cause miscarriage and premature delivery [31-33]. The subclinical hypothyroidism, with normal free thyroxine (fT4) level and high TSH level, is the most common during the pregnancy [34,35]. Subclinical hypothyroidism and overt hypothyroidism can increase the risk of pregnancy loss and fetal death [32,36,37] and cause gestational hypertension, cardiac dysfunction, placental abruption, anemia, pre-eclampsia, fetal distress, congenital malformations, low birth weight, pre-term delivery, and postpartum hemorrhage [31,36,38]. In general, hypothyroidism was associated with morbid obesity and post-term delivery [39].

More specifically, the reduction in the THs during the early fetal period causes irreversible brain damage [40,41] and increases the risk of non-verbal cognitive disorders [42-44]. A severe deficiency of gestational THs causes neonatal sensory, motor, and cognitive dysfunctions, and produces long-lasting variations in neonatal brain structure [45,46]. As well, Thompson et al. [47] reported that subclinical hypothyroidism and maternal hypothyroxinaemia might cause neonatal intellectual disability. Fetal hypothyroidism can be attributed to disorders in synthesis, metabolism, and transport of maternal THs [48], and iodine deficiency [49,50]. In general, the maternal stress during the gestation can modulate the maternal thyroid function [51].

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In conclusion, the long-term effects of maternal hypothyroidism during the gestation may represent a risk factor for the fetal and neonatal development especially regarding the cardiac and neurodevelopmental disorders. Thus, the ideal regulation of maternal thyroid function during or before pregnancy is significant not only for the health of women but also for the health of fetus and neonates. Further research is required to determine the developmental, biochemical, and behavioral dysfunctions produced by gestational hypothyroidism in fetus and newborn.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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