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Rapid Communication

Multidirectional Imprinting of Maternofetal Thyroid Hormones

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The regular activities of thyroid hormones (THs) are essential for the fetal and neonatal development (El-bakry et al., 2010; Ahmed, 2011, 2012a,b, 2013, 2014, 2015a-c, 2016a-d, 2017a-o; Ahmed et al., 2008, 2010, 2012, 2013a,b, 2014; 2015a,b; Ahmed and Ahmed, 2012; Ahmed and Incerpi, 2013; Van Herck et al., 2013; Ahmed and El-Gareib, 2014, Incerpi et al., 2014; Candelotti et al., 2015; De Vito et al., 2015; El-Ghareeb et al., 2016; Ahmed and El-Gareib, 2017; Endendijk et al., 2017; Gigena et al., 2017). The hypothyroidism during the gestation can cause several irreversible damages in the central nervous system (CNS) (Ahmed et al., 2008; Forhead and Fowden, 2014; ATA, 2015; Opazo et al., 2017). The neural damages include the following:

- Variation in developing CNS (Iskaros et al., 2000; Zhang and Lazar, 2000; Collazos et al., 2003; Pop et al., 2003; Ausó et al., 2004; Bianco and Larsen, 2005; Buimer et al., 2005; Cuevas et al., 2005; Klecha, 2006; Cheng et al., 2010; Raymond and LaFranchi, 2010; Negro et al., 2011; Moleti et al., 2011; Patel et al., 2011; Stagnaro-Green et al., 2011; Gessl et al., 2012; Parkes et al., 2012; Ramprasad and Bhattacharyya, 2012; Bernal and Morte, 2013; Chang and Pearce, 2013; Pascual and Aranda, 2013; Forhead and Fowden, 2014; Schroeder and Privalsky, 2014; Somberg and Molnar, 2016);
- Distortion the cellular migration and outgrowth (Martinez-Galan et al., 1997; Ausó et al., 2004; Cuevas et al., 2005; Ahmed et al., 2008; Cheng et al., 2010); disturbance in the neurotransmitter system (Wu et al., 2010; Cattani et al., 2013; Koromilas et al., 2014; pazo et al., 2017);
- Decrease the regulation of Myelin Basic Protein (MBP) (O'Shea and Williams, 2002; Bernal et al., 2003; Calza et al., 2005);
- Increased the apoptosis and the cellular death (Koromilas et al., 2010; pazo et al., 2017);
- Distortion in the neurite growth and axon of hippocampal regions (CA1-3) (Ahmed et al., 2008; Opazo et al., 2008; Koromilas et al., 2010);
- Disturbance in the spatial learning related to c-Fos and c-Jun genes (Opazo et al., 2008); and
- Reduction in the formation of myelinated axons (O'Shea and Williams, 2002; pazo et al., 2017).

On the other hand, the gestational hypothyroidism can alter the immune system.

- Diminish the leukocytes and the cellular number of B cells and T cells in thymus and spleen (Rooney et al., 2003);
- Decrease the weight of thymus and spleen (Erf, 1993; pazo et al., 2017);
- Elevate the number of lymphocytes (Albornoz et al., 2013) and inflammatory cells (Nieto et al., 2016; pazo et al., 2017); and
- Disturb the ratio of CD8+ and CD4+ T cells (Erf, 1993).

On the basis of these data, it can be decided that the THs are significant for the maturation of CNS and immune system though the mechanisms triggered in immune cells are uncommon. Also, the gestational THs insufficiency may distort the maternofetal immune response. However, the mechanism of this disturbance remains still indefinite.

Additional studies are necessary to improve the quality of our life.

Conflict Of Interest: The author declares that no competing financial interests exist.

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