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Thyroid-Insulin Dysfunction during Development

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Letter to Editor

Thyroid hormones (THs) are key hormones regulating the development(Ahmed, 2011, 2012a,b, 2013, 2014, 2015a-c, 2016a-d, 2017a-f; Ahmed et al., 2013a,b, 2014; 2015a,b; Ahmed and Incerpi, 2013;Van Hercket al., 2013; Ahmed andEl-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), particularly glucose homeostasis (Fain and Bahouth, 1998), metabolism and energy balance (Wang et al., 2008; Ahmed, 2013). Also, insulin is a vital hormone modifying these biological processes during the development (Hytinantti et al., 2008; Ahmed, 2013; Candelotti et al., 2015; Cremaschi et al., 2016). There is a synergistic mechanism between THs and insulin levels during the perinatal development and growth (Tsai et al., 2004; Hytinantti et al., 2008; Ahmed, 2013). In hypothyroid state, the level of insulin was delayed (Robson et al., 2002). Reversibly, the disturbance in insulin action, in hypothyroid state, might be responsible for the hypothalamic-pituitary-thyroid-axis (HPTA) disorders (Ahmed, 2013, 2016d).Additionally, a symptomatic hypoglycaemia, dyslipidemia, elevated low density lipoprotein (LDL) cholesterol and triglyceride were recorded in hypothyroidism (Mohn et al., 2002; Hueston& Pearson, 2004; American Diabetes Association (ADA), 2011; Marwaha et al., 2011). Also, the reduction in the high density lipoprotein (HDL) cholesterol, overall glucose turnover and peripheral glucose utilization was reported by Miura et al. (1994), Cettour-Rose et al. (2005) and Johnson (2006). The reduction in the glucose level might be caused growth retardation and delayed the sexual maturity (Gutch et al., 2013). Also, the diminution in the level of insulin growth factor-I (IGF-I) is correlated to the disturbancebetween the activities of THs and insulin that may retard the development and growth (Ramos et al., 2001 & 2002; Ahmed, 2013). Thus, these disorders can reduce the uteroplacental passage to fetuses (Ahmed and El-Gareib, 2017).In conclusion, any disruption in the THs-insulin axis may possibly influence the developmental mechanisms.Furtherstudies are necessary to distinguishthe molecular mechanisms of this axis during the development.

Conflict of interest: The author declares that no competing financial interests exist.

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