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Maternal Hypothyroidism and Ovarian Dysfunction

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EDITORIAL

Thyroid hormones [THs; thyroxine (T4) and 3,5,3'-triiodothyronine (T3)] are significant for the perinatal developmental period (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 Hercket 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), particularly the developing ovary, folliculogenesis, ovulation, fertilization rate,and endometrium (Wakim et al., 1994; Doufas and Mastorakos, 2000; Krassas et al., 2010; Abd-El Fattah, 2011; Shu et al., 2011;Treesh and Khair, 2014; Meng et al., 2017).

In humans and experimental animals, a hypothyroid state, reduction in the levels of T4 and T3, can cause several female reproductive problems (Joshi et al., 1993; Tomasi et al., 1997; Hatsuta et al., 2004; Surks et al., 2004; Abalovich et al., 2007; Poppe et al., 2008; Krassas et al., 2010; Vanderpump, 2011; Pearce et al., 2013; Chai et al., 2014; Lazarus, 2014; Vissenberg et al., 2015; Meng et al., 2016 &2017)such as **(1)** disrupt the folli culogenesis; **(2)** impair the ovulation; **(3)** impact the ovarian follicular reserve; **(4)** decrease the size and number of the growing follicle; **(5)** delay the fertilization rates; **(6)** significantly increase the level of prolactin; and **(7)** miscarriage and pregnancy problems. In addition, hypothyroidism in experimental animals can cause the following: **(1)** significantly decrease the level of basal luteinizing hormone (LH) causing ovarian atrophy (Ortega et al., 1990; Mattheij et al., 1995; Toheiet al., 1998); **(2)** non-significant changes in the levels of follicle-stimulating hormone (FSH)(Armada-Dias et al., 2001); **(3)** disrupted the level of gonadotropin releasing hormone (GnRH) (Mattheij et al., 1995; Tohei et al., 1998; Hatsuta et al., 2004); **(4)** extended the period of vaginal dioestrus (Hapon et al., 2003); **(5)** irregularity in the estrous cycle and elevated the subsequent LH surge (Mattheij et al., 1995); **(6)** increased the degeneration of recruited primordial and/or primary follicles (Hirsh field, 1994; Johnson et al., 2004); **(7)** a polycystic ovarian syndrome (PCOS) (El-Banhawy et al., 1997; Cardoso et al., 1999; Moravvej et al., 2009; Ganie et al., 2010;Muderris et al., 2011; Shu et al., 2011; Du and Li, 2013;Kang et al., 2013;Sinha et al., 2013;Treesh and Khair, 2014); and **(8)** reduced the frequency of pregnancy and litter size (Parrott et al., 1960;Gleicher et al., 2007; Unuane et al., 2011).

On the basis of these studies, it can be reported that the regular accessibility of the maternal THs may dynamic for the developing ovary. Thus, the normal reproductive activity desires the normal levels of THs. Also, the maternal hypothyroidism may negatively disturb the fertility, folli culogenes is(atretic follicles and proliferation of interstitial cells) and ovulation (ovarian cysts), and delay the sexual maturation. Though, the mechanism of action of female sub fertility relating to maternal hypothyroidism remains unknown. Further examinations are required to investigate the connection between the thyroid disorders and ovarian diseases and explore a new equilibrium in follicle recruitment.

Conflict of interest

The author declares that no competing financial interests exist.

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