Congenital Hypothyroidism, Developmental Skills, and Voice-Speech Disorders

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SHORT COMMUNICATION

Maternal thyroid hormones (THs) regulate the developing brain during the perinatal period (Elbakry et al., 2010; Ahmed, 2011, 2012a,b, 2013, 2014, 2015a-c, 2016a-d, 2017a-v, 2018a-r; Ahmed and Ahmed, 2012; Ahmed et al., 2008; 2010; 2012; 2013a,b, 2014, 2015a,b, 2018a,b; Ahmed and Incerpi, 2013; Van Hercket 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), in particular the speech, voice, language and hearing processes (American Academy of Pediatrics/American Thyroid Association, 2006; Fisher, 2006; Wasserman et al., 2012; Muñoz et al., 2014; Dayal et al., 2016; Oliveira de Andrade et al., 2017). On the other hand, the elevation in the concentration of thyroid-stimulating hormone (TSH), primary hypothyroidism state, can increase the risk of voice disorders (Mohammadzadeh et al., 2011). Lack of thyroxine (T4) and 3, 5, 3’-triiodothyronine (T3) can cause a congenital hypothyroidism, the most common endocrine congenital disease, in childhood (Muñoz et al., 2014). Congenital hypothyroidism can cause several neurodevelopmental disorders such as slowness, dementia, memory deficiency, and depression (Kratzsch and Pulzer, 2008; Lass et al., 2008; Blum et al., 2015; Jia et al., 2015; Navarro et al., 2017; Salazar et al., 2017). Previously, Fuggle et al. (1991) reported that the levels of motor skills in children were severely diminished due to the congenital hypothyroidism. As well, the frequency of oral fluency in children with thyroid agenesis was also decreased (Kooistra et al., 1994; Muñoz et al., 2014). More importantly, severe congenital hypothyroidism can increase the phonologic, language, and voice disturbances (Bargagna et al., 2000), and cause more aberrations in mathematics than moderate congenital hypothyroidism and control groups (Simons et al., 1997). In patients with congenital hypothyroidism, there were deviations in the developmental skills (cognitive, motor, linguistic, adaptive, and social), in the socio-linguistics skills and in the self-care skills (Gejão et al., 2008 & 2009; Muñoz et al., 2014). These disorders can be attributed to the ability of congenital hypothyroidism to delay and disrupt the neuronal growth and differentiation, and diminish the synaptic transmission (Koromilas et al., 2010; Vanderpump, 2011; Yu et al., 2014; Salazar et al., 2017). These variations can impair the metabolic process (poor feeding), decrease the weight gain and growth (Salazar et al., 2017), and disturb the developmental skills, speech-language communications and hearing activity in children (Muñoz et al., 2014).

Thus, it is also worth asserting that THs can stimulate the development of the speech, voice, language, hearing, and all developmental skills. As well, any disruptions in the concentrations of THs during the development (congenital hypothyroidism) may perturb the speech-language axis, hearing activity, and several developmental skills in children. In utero hypothyroidism may impact the subsequent intellectual functioning, cognitive behaviors (visuoperceptual, neuromotor, and language comprehension), school learning, and generally quality-of-life. However, the clinical significance of these disorders still must be evaluated. Thus, screening the neonatal thyroid gland may be required to develop alternative diagnostic actions for identifying congenital hypothyroidism earlier, possibly in utero. This would diminish the risk of any consequent impairment that might adversely disturb these children later. Also, the developmental evaluations during the first 2
years of life are prognostic of the intelligence percentage and speech-language axis later in childhood. Further examinations are warranted to follow the association between children with congenital hypothyroidism and the school progress.

REFERENCES


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