High Prevalence of Thyroid Dysfunction in Children with Simple Obesity

Exogenous obesity is associated with physical, psychological, metabolic and hormonal problems which contribute to the increased risk of cardiovascular diseases and diabetes in later life [1,2]. Amongst hormonal disturbances, thyroid dysfunction is the most common [3]. The underlying mechanisms are poorly understood and include an adaptive response to increase energy expenditure, hyperleptinemia, thyroid hormone and insulin resistance, increased cytokine concentrations and thyroid autoimmunity [3]. The average prevalence of obesity-related thyroid dysfunction in children is reported as 14% [3]. However, the prevalence in Indian obese children is unknown [4].

We performed a case record review of children aged 6-12 y having exogenous obesity (BMI >2 standard deviations above the WHO 2007 Growth Reference median). Obesity-related thyroid dysfunction was defined as elevation of TSH (4-10 mIU/L) with or without alterations in total T4 (normal 4.5-11.5 ug/dL) or total T3 concentrations (normal 0.8-2.0 ng/mL). Of the 204 patients registered in the Pediatric Obesity Clinic of our hospital between January 2017 and March 2018, 82 were excluded either due to age criteria or an endogenous cause of obesity. Fifty one (31.4%) of the remaining 162 with simple obesity were found to have isolated hyper-thyrotropinemia. Children with or without isolated hyperthyrotropinemia had similar mean (SD) weight Z-scores [3.48 (1.90) *vs*. 3.13 (2.41), *P*=value 0.36], BMI Z-scores [4.01 (1.77) *vs*. 4.35 (2.29), *P*=0.30], total T3 [2.03 (1.18) *vs*. 1.94 (0.52) ng/mL, *P*= 0.83] and total T4 [8.95 (2.18) *vs*. 8.87 (2.23) µg/dL, *P*= 0.68] concentrations. The mean (SD) TSH values of children with and without isolated hyperthyrotropinemia were 5.70 (1.06) and 2.84 (0.81) mIU/L, respectively.

The prevalence of thyroid dysfunction in obese children and adolescents has been reported to range between 9.2 and 22.2% [3]. Studies from Nigeria, Denmark and Turkey show a low prevalence (<15%); whereas, a higher prevalence has been reported from Germany and Israel (17% and 22.2%), respectively [3]. The reasons for such a high prevalence in our study are unknown. Majority of the previous studies included preschoolers and adolescents (age range 3-18 yr) whereas our children were of school-going age. Additionally, the still poorly understood racial and ethnic differences in the associations of body fatness with hormones and metabolic factors in exogenous obesity may have an underlying role that needs exploration in further studies [5]. Although isolated hyperthyro-tropinemia does not need any specific treatment except weight reduction, screening for thyroid dysfunction is important in children with exogenous obesity.

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