EDITORIAL

Association of Hypothyroidism with Metabolic Syndrome

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Metabolic Syndrome (MS) is diagnosed when three out of five cardiometabolic risk factors are present namely hyperglycaemia, low HDL-Cholesterol, high triglycerides, systolic hypertension and obesity.[1] Presence of metabolic syndrome increases the risk of cardiovascular diseases and type 2 diabetes mellitus (T2DM).[2] Other conditions have also been related to metabolic syndromes e.g. cancer, sleep apnea, polycystic ovary syndrome, thyroid disruptions and others.[3,4] There is a worldwide epidemic of MS, Pakistan and some other developing countries are no exception[4]. Hypothyroidism can be overt or sub-clinical. Subclinical-hypothyroidism (SCH) is defined when TSH values are more than 4.0 mIU/L but less than 10 mIU/L with normal thyroid hormones (fT4 and fT3).[5,6] The etiological factors for SCH and overt disease are the same with a difference of severity of the disease, so SHO is also called 'Mild Hypothyroidism' as by definition SCH is only a biochemical diagnosis and has nothing to do with the presence or absence of clinical features of thyroid disease. SHO has been shown to be much more common as compared to overt disease.[7] SCH becomes a dilemma for the physician regarding the question of treatment or waiting for the overt disease.[8,9] Amongst many concerned related to hypothyroidism, a propensity for dyslipidaemia is of great concern more so if the patients has other cardiovascular risk factors, too. Khan et al (2018) have recently shown that lipid parameters are adversely affected in hypothyroidism as a continuous function of increasing level of TSH. Lipid changes are found to be more subtle in the subclinical hypothyroid group than cases with overt hypothyroidism.[10] Most significant effect has been shown to be on LDL-cholesterol, non-HDL-cholesterol and urine albumin-creatinine ratio. In another recent study it has been shown that he association between MS and hypothyroidism depends on the presence of T2DM. The most important pathophysiological mechanism in T2DM is Insulin Resistance (IR), so it is difficult to ascertain the role of SCH in causation of MS in the presence of T2DM.[11]

Various components of metabolic syndrome i.e. high blood pressure, elevated triglycerides level, obesity, and IR have been shown to be closely related to subclinical hypothyroidism.[12,13] It has also been shown that even persons with TSH in the upper reference values (2·5–4·5 mu/l) were more obese, had higher triglycerides, and had an increased likeliness for the metabolic syndrome.[14] Slightly elevated serum TSH levels have also been shown to be associated with an increase in the occurrence of obesity.[15] Another puzzling finding about thyroid hormones and metabolic syndrome is from Wolffenbuttel et al (2017), who have shown that in men, lower FT4 is related to MS but in the highest free Triiodothyronine (FT3) and free thyroxine (FT4) quartiles, there is a 50–80% increased risk of having MS compared to the lowest quartile.[16] This has been confirmed in other recent studies showing MS developing in patient with high FT3 as well as higher FT3/FT4 ratio.[17,18] Insulin resistance is the major biochemical mechanism involved in the causation of MS as well as polycystic ovaries syndrome and non-alcoholic fatty liver disease.[19] Hypothyroidism is associated with elevated markers of insulin resistance such as homeostatic model of insulin resistance (HOMA-IR) in adults[20] and children.[21] Despite these known associations, the temporal relationships between subclinical hypothyroidism and assorted cardiovascular risk factors remain largely unexplored and studies are needed to find the chronology of development of components of MS with progression of hypothyroidism. Moreover, TSH should be taken as yardstick for decreasing thyroid function as it is a hormone of the mother gland and the anxiety of the mother gland (pituitary) cannot be compared with the concern of a small child (thyroid) who is totally oblivious of his health

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condition due to his shear ignorance.[22] TSH alone is a sufficient parameter for the early diagnosis and monitoring of hypothyroidism before one or more components of MS develop. In clinical practice, before starting treatment of dyslipidaemia, obesity or systolic hypertension, especially in a young patient, TSH estimation must be not be forgotten!

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