

Commentary

Thyroid binding globulin deficiency

Thyroid hormones circulate in the blood stream mostly bound to a set of plasma proteins which widely differ in their concentration and affinity for the hormones. The three major transport proteins are thyroxine (T₄)-binding globulin (TBG), T₄-binding prealbumin (TBPA), and albumin. TBG encoded by the TBG gene on chromosome Xq22 is the major transport protein which carries about 75 per cent of T₄ in the circulation¹ and, therefore, represents physiologically the most important T₄-binding protein. TBPA has been named transthyretin (TTR) for the role it also plays in the transport of the retinol-binding protein. Less important proteins with thyroid hormone binding activity are lipoproteins²⁻⁴. Variations in concentration of carrier proteins of hormones may influence the effect of hormones and may cause confusion of interpretation of laboratory results. Inherited TBG deficiency is considered to represent X-chromosome linked inheritance with hemizygote affected males and heterozygote female carriers with intermediate values for T₄ and TBG⁵. Commercial test kits for free thyroxine (FT₄) may present considerably different results in conditions with TBG deficiency. When high level of measured FT₄ combined with normal thyrotropin (TSH) is found, TBG deficiency should be considered⁶.

In the study by S.V. Bhatkar *et al*⁷ in this issue, the authors have tried to find out TBG deficiency in a large sample which is the first study of its kind reported from India. They found TBG deficiency in two males and in one case TBG excess. This finding of total TBG deficiency in males is same but in females is rare as reported in some other study⁸. Detailed genetic studies have been carried out by some investigators which showed evidence of X-linked mode of transmission on segregation analysis. Mechanism suggested by genetic analysis of hereditary TBG deficiency revealed single nucleotide

deletion, common among Japanese, from the allele specific amplification of the TBG genes of the family⁹. Since this is the only study from India reporting the prevalence of TBG abnormalities it is desired that similar studies from other centers handling large samples may further confirm the exact prevalence of this entity in Indian population.

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