No conflict of interest

Topic: Thyroid

Asymptomatic hyperthyrotropinaemia in children, does it correlate to true thyroid gland dysfunction?

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Introduction and objectives

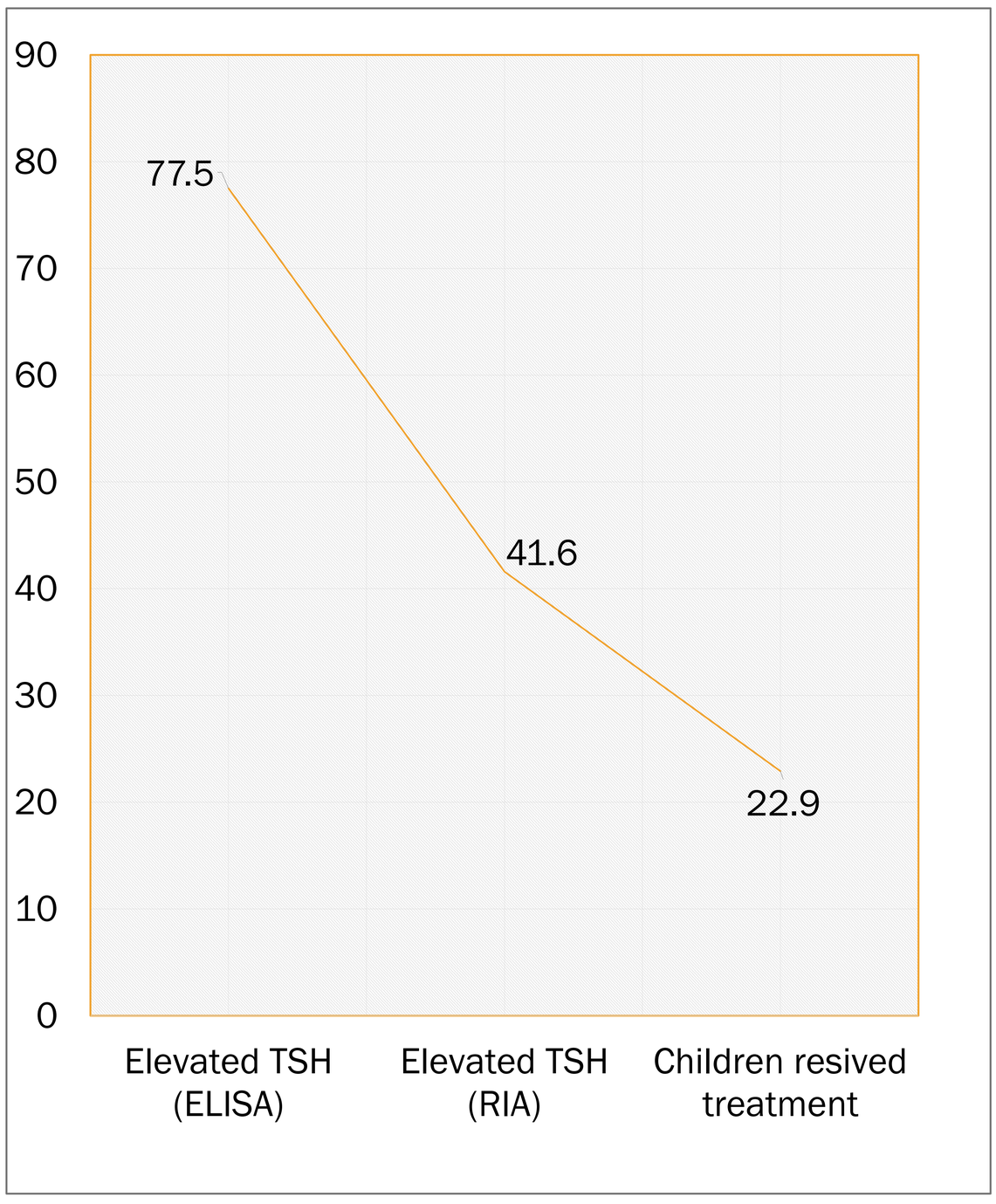
Thyroid stimulating hormone (TSH) abnormalities are a frequent laboratory test finding, which may hinder thyroid dysfunction. One of the most accurate laboratory methods for testing thyroid function (TFTs) is the radioimmunoassay (RIA) method. RIA is an immunoassay that uses radiolabeled molecules in a stepwise formation of immune complexes. It is a very sensitive in vitro assay technique used to measure concentrations of substances, usually measuring antigen concentrations (for example, hormone levels in blood) by use of antibodies.

The purpose of the study was to examine whether a random finding of hyperthyrotropinaemia (raised TSH with normal levels of FT4) is an indication of a thyroid gland disorder.

Methods

48 healthy children (25 boys, 23 girls) were referred to the Paediatric Endocrinology Outpatients of a Tertiary Centre for hyperthyrotropinaemia found when TSH was performed either randomly, or due to family history of thyroid disorder or due to various symptoms (short stature, constipation, obesity). None of the children were on replacement therapy with levothyroxine. It was checked whether repeat and/or further testing of TFTs had been performed prior to referral and the laboratory method used to confirm results. All subjects had repeat TFTs (TSH, Free T4 (FT4), anti-TPO, anti-Tg) performed with the RIA method. Statistical analysis performed with SPSS, significant p value <0.05.

Table 1. No of children (%) and TSH levels

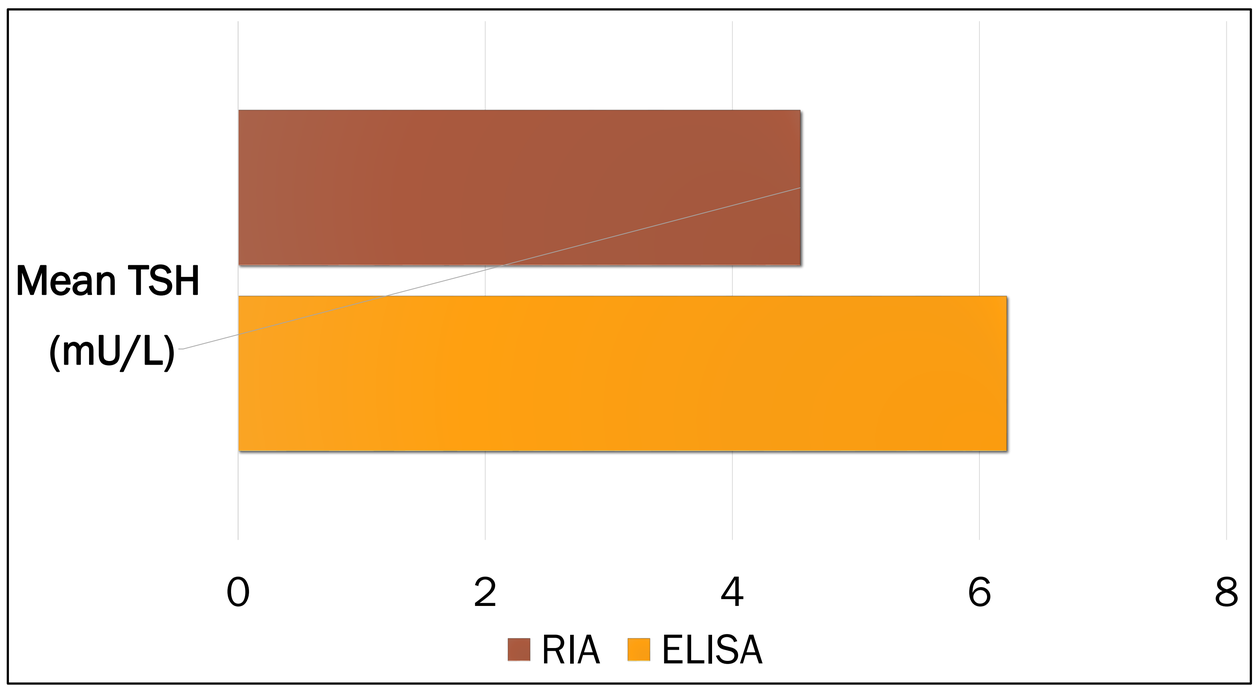


Results and conclusions

Mean age of children was 8.9 years (median 9.7y, range 1-15 years old). At referral 28 children (77.5%) had abnormal TSH values (>5 mU/L, method ELISA), mean 6.59 mU/ L(range 5.05 to 12.35mU/L) (table 1). Only 13 (27%) had TFTs repeated before referral, 8(16.6%) had a thyroid ultrasound scan performed. After testing with the RIA method, only 20 children (41.6%) had raised TSH, and only one child had TSH>10mU/L (table 2). 11 children (22.9%) received replacement treatment with levothyroxine. Significant difference was observed between the mean TSH values at referral and the ones tested with RIA method (6.22mU/L and 4.55mU/L respectively, $p<0.05$). No statistical significance was observed between males' and females' TSH mean values either at referral or when tested with RIA, 5.83 mU/L and 6.69 mU/L ($p=0.11$), and 4.67mU/l and 4.42mU/L respectively, ($p=0.76$).

The enhanced sensitivity and specificity of TSH assays have greatly improved the assessment of TFTs. In mild hyperthyrotropinaemia (TSH>4.05mU/L,<10mU/L), clinical assessment of the patient is recommended. Abnormal thyroid function needs to be confirmed with an accurate method as RIA.

Table 2. Mean TSH levels and measurement methods



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