55th Annual ESPE Meeting, Paris, 10-12 September 2016, Thyroid

Thyroid function anomalies in children with Down syndrome: early TSH alteration can predict future hypothyroidism development?

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Disclosure Statement
The authors have no conflicts of interest to disclose.

Background

Subclinical hypothyroidism is a common finding in Down syndrome (DS) patients and transition towards overt hypothyroidism can occur [1], but there are no predictor factors to identify patients that will need replacement therapy later in life [2].

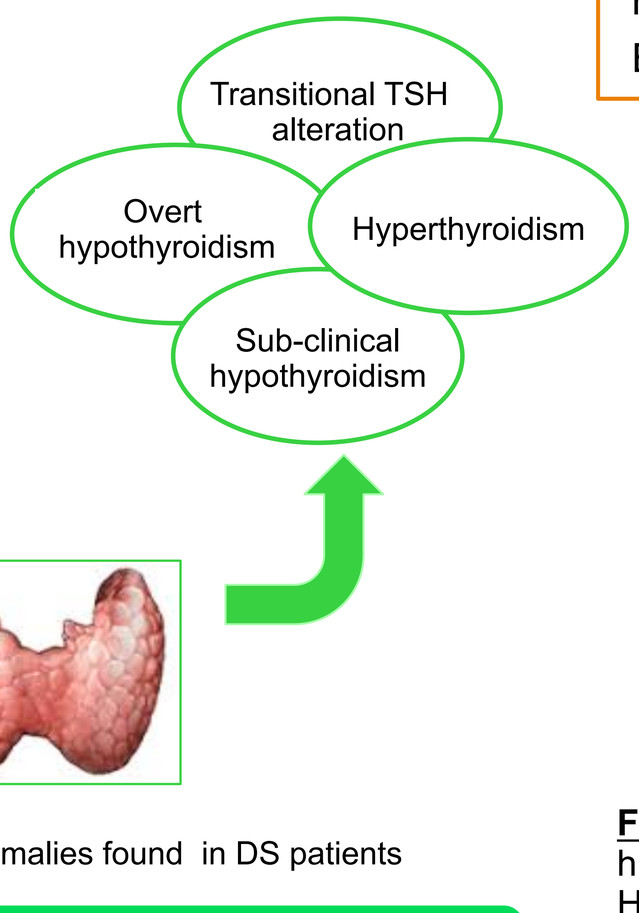


Figure 1: possible thyroid function anomalies found in DS patients

Objective and hypothesis

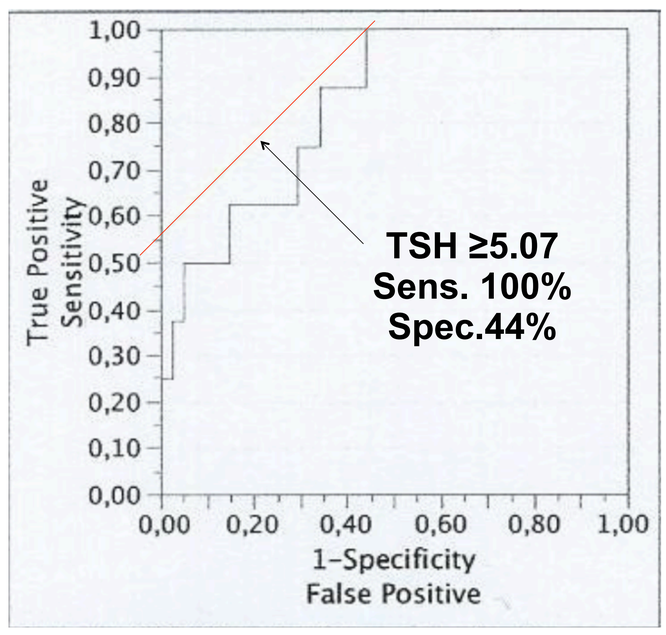
This is a retrospective cohort study on a population of DS paediatric patients. This study was designed to evaluate possible early predictive features of hypothyroidism development.

Methods

We retrospectively evaluated 49 paediatric DS patients (31 males and 18 females). Median age at first evaluation was 3.47 (0.5 – 15.7) years and follow-up 4.3 years (1-9). Thyroid function was described as normal (TSH 0.31-5.00 μUI/ml), subclinical hypothyroidism (TSH 5.10-10.00 μUI/ml, normal fT4 and fT3) or overt hypothyroidism (TSH > 10.00 μUI/ml). Autoimmune etiology was investigated through auto-antibodies positivity (AbTPO, AbTG; TRAb). Statistical analysis was performed using logistic regression-ROC curves, χ^2 test. The statistical significance was set at $p < 0.05$.

Results

In our study 38,8% of patients (19/49) showed subclinical hypothyroidism during follow-up. L-thyroxine was initiated in 8 patients (16.3%), who were diagnosed with overt hypothyroidism (4/8 have autoimmune thyroiditis). TSH cut-off value of 5.07 μUI/ml at first evaluation was significantly predictive of overt hypothyroidism development during follow-up (See figure 2 A and B).



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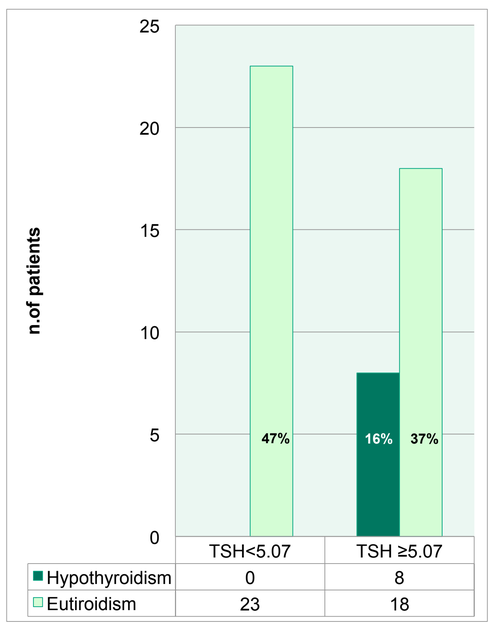

B

Figure 2A and B: ROC-curve analysis showing the TSH value with the highest sensibility predicting hypothyroidism requiring treatment (A). Histogram showing the distribution during the follow-up of the patients according to TSH cut-off of 5.07 at the first examination (B).

Thyroid related Abs*	Treated	Not Treated
Positive	5	5
Negative	3	36

* TPO or TG or TSH-receptor antibodies; chisquare 7.562; p<0.01.

Positivity of one or more thyroid related antibodies at the first examination was more frequently observed in patients requiring treatment during follow-up.

Conclusions

Our study showed that an early surge of TSH value over 5.07 μUI/ml, possibly associated with auto-antibodies positivity, can identify DS patients who need a more careful follow-up of thyroid function due to higher risk of hypothyroidism.

References

1. Lughetti L, Predieri B, Bruzzi P, et al. Ten-year longitudinal study of thyroid function in children with Down's syndrome. Horm Res Paediatr 2014; 82: 113-121.
2. King K, O'Gorman C, Gallagher S. Thyroid dysfunction in children with Down syndrome: a literature review. Ir J Med Sci 2014; 183: 1-6.

DOI: 10.3252/pso.eu.55ESPE.2016