Thyroid and islet autoantibodies predict autoimmune thyroid disease already at Type 1 diabetes diagnosis

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• **Introduction and objectives:** Screening of autoimmune thyroid disease in children and young adults with Type 1 diabetes is important but vary greatly between clinics. The aim was to determine the predictive value of thyroid autoantibodies, thyroid function, islet autoantibodies, and HLA-DQ at diagnosis of Type 1 diabetes for autoimmune thyroid disease during subsequent follow-up.

• **Methods:** At diagnosis of Type 1 diabetes, samples from 2433 children were analysed for autoantibodies against thyroid peroxidase (TPOAb), thyroglobulin (TGAb), glutamic acid decarboxylase (GADA), insulin (IAA), insulinoma-associated protein-2 (IA-2A), and the three variants of the zinc transporter 8 (ZnT8W/R/QA) as well as HLA-DQA1-B1 genotypes and thyroid function. After 5.1-9.5 years disease duration, children treated with thyroxine were identified in the Swedish National Board of Health and Welfare Prescribed Drug Register.

• **Results:** Thyroxine had been prescribed to 6% (147/2433; 66% girls). In patients below 5 years, female gender (HR=4.60, p=0.008) and GADA (HR=5.80, p=0.02) were significant predictors. In patients 5-10 years, TPOAb (HR=20.56, p<0.0001), TGAb (HR=3.40, p=0.006) and TSH outside the reference limit (HR=3.64, p<0.001) were predictors while in the 10-15 year olds, TPOAb (HR=17.00, p<0.001) and TSH outside the reference limit (HR=4.11, p<0.001) predicted future thyroxine prescription.

• **Conclusions:** In addition to TPOAb and TSH, positive GADA tested at the diagnosis of type 1 diabetes is important for the prediction of autoimmune thyroid disease in children below 5 years of age.

Screening suggestions for autoimmune thyroid disease in children and adolescents with Type 1 diabetes based upon markers at Type 1 diabetes diagnosis:

- TPOAb negative with normal TSH: TSH measurement every other year.
- TPOAb positive with normal TSH and/or GADA positive individuals under 5 years: TSH measurements every year.