

## Introduction

- Children with type 1 diabetes (T1D) have increased prevalence of clinically significant anti-thyroid peroxidase antibody (anti-TPO) positivity and autoimmune thyroiditis<sup>1</sup>.
- In healthy children the prevalence of clinically significant anti-TPO level, defined as >100 kU/L, can be up to 3%<sup>2</sup>.
- The prevalence of clinically significant anti-TPO positivity in children with HLA-conferred susceptibility to T1D, is not known.

## Objectives

- To evaluate the serum levels of anti-TPO and the prevalence of clinically significant anti-TPO positivity in children with HLA-conferred susceptibility to T1D.

## Subjects

- 180 children (86 boys) with a HLA-conferred susceptibility to T1D from the DIABIMMUNE Estonian birth cohort.
- Mean age 8.7 years (range 7.5 to 9.6 years).
- Three children had developed T1D.
- None had a known history of thyroid disease.

## Methods

- Serum concentrations of anti-TPO were measured with previously validated ECLIA method.
- The test manufacturer's reference range of < 18 kU/L for this age group was used.
- The lower detection limit of the test was 5 kU/L.
- Clinically significant anti-TPO positivity was set as anti-TPO concentration of >100 kU/L.
- The statistical analysis was performed with Excel using the Mann-Whitney test,  $p < 0.05$  was considered statistically significant.

## Results

- 23 children (17 girls) had anti-TPO levels above the reference range, i.e. 12.8% of all subjects.
- In 3 cases (1.7%), all girls, anti-TPO was >100 kU/L, suggesting a very likely autoimmune thyroiditis.
  - Two of the three subjects had normal thyroid function tests, one was lost to follow-up.
- Anti-TPO levels ranged from <5 to 373 kU/L.
- Girls had significantly higher median anti-TPO concentration than boys (12.0 vs 10.5 kU/L;  $p = 0.0002$ ).

## Results

Figure 1. Distribution of subjects by their anti-TPO levels

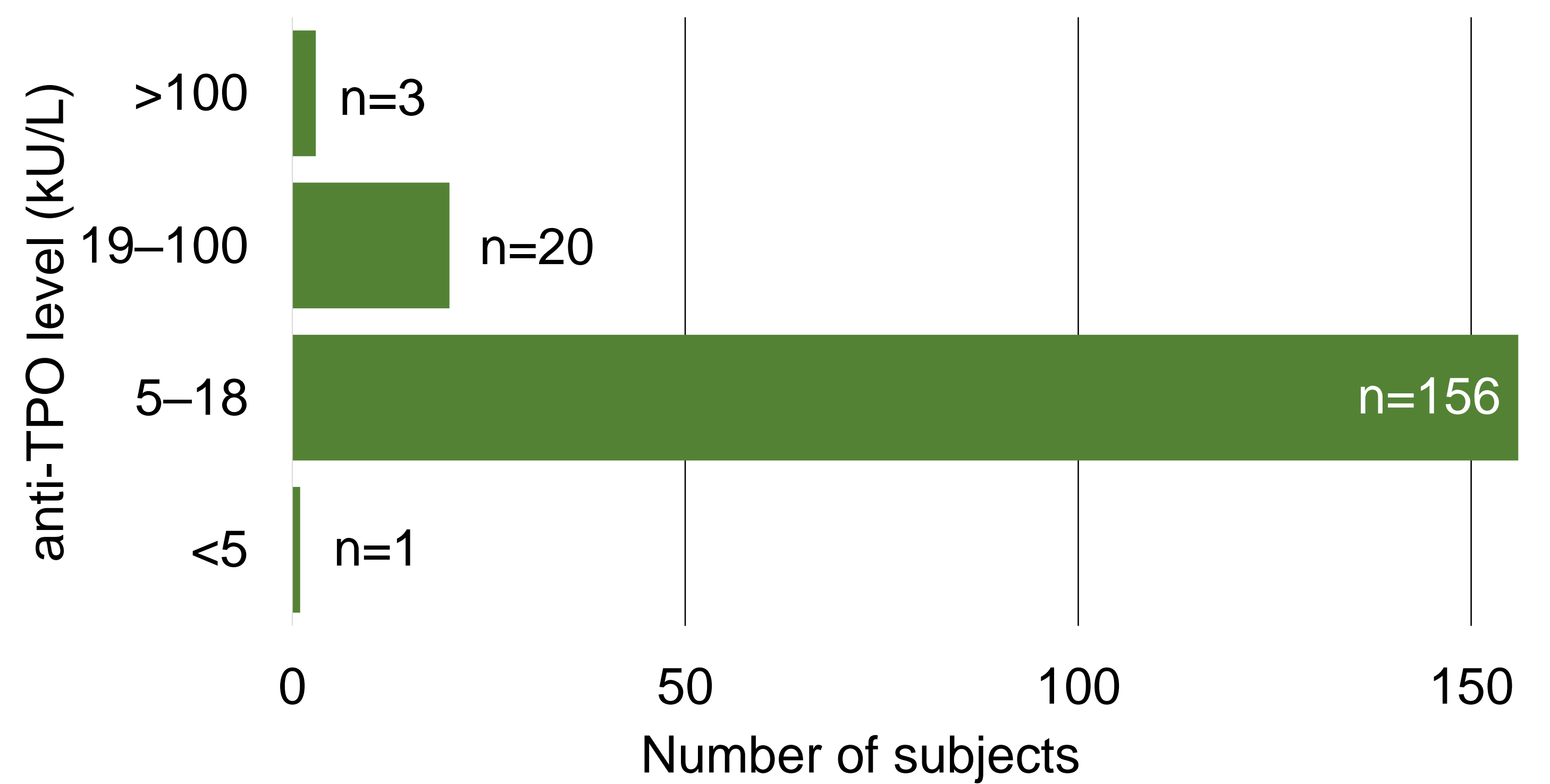
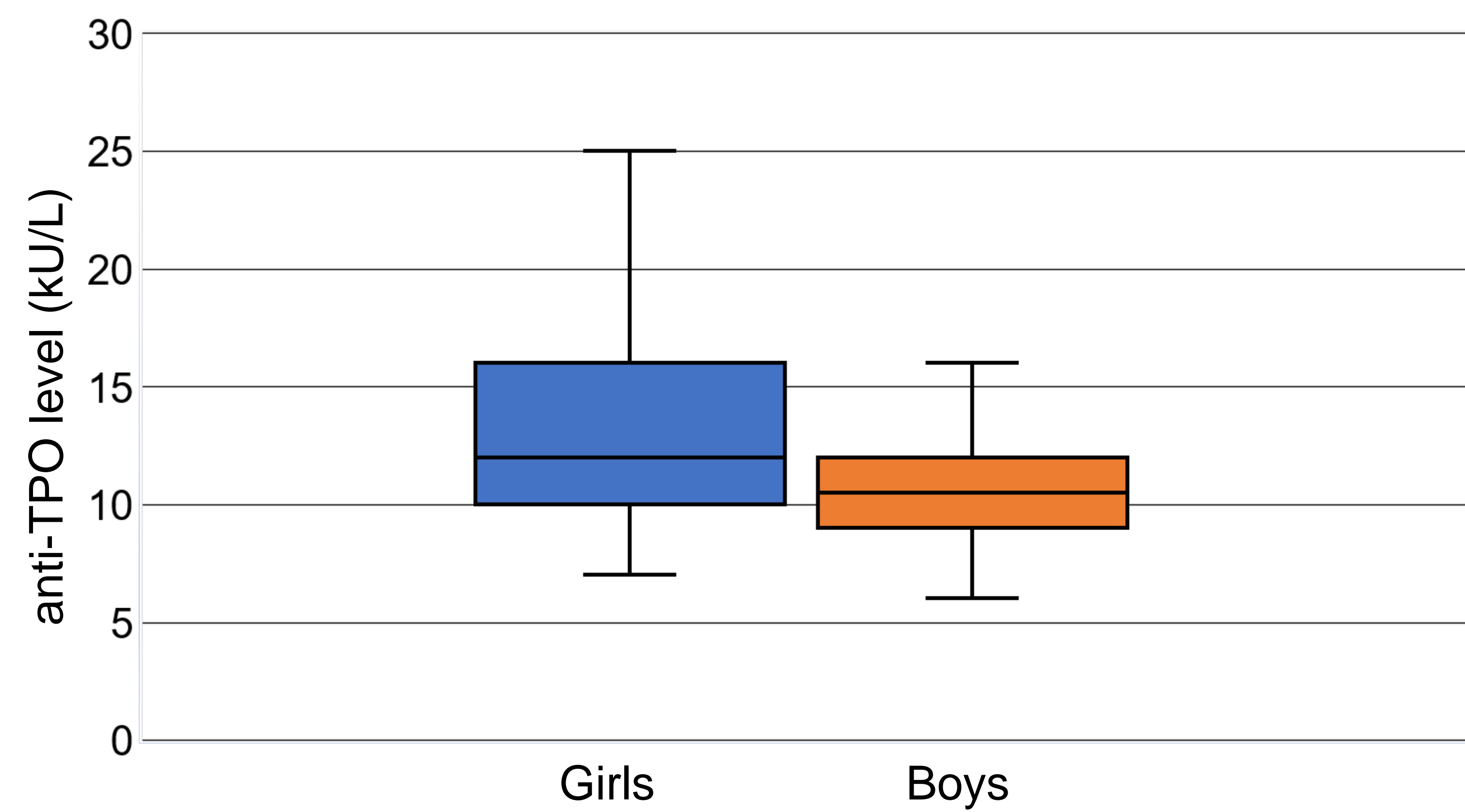


Figure 2. Comparison of median anti-TPO levels



## Conclusions

- In children with HLA-conferred susceptibility to T1D the prevalence of clinically significant rise of anti-TPO levels was similar to previously reported data in healthy children.
- Almost 13 percent prevalence of anti-TPO positivity in the cohort is comparable to that described in T1D subjects of the same age group<sup>3</sup>.
- Further studies are necessary to clarify the clinical significance of this finding.

## References

1. Jonsdottir B, Andersson C, Carlsson A, Delli A, Forsander G, Ludvigsson J, et al. Thyroid autoimmunity in relation to islet autoantibodies and HLA-DQ genotype in newly diagnosed type 1 diabetes in children and adolescents. *Diabetologia*. 2013 Aug;56(8):1735-42.
2. Kabelitz M, Liesenkötter KP, Stach B, Willgerodt H, Stäblein W, Singendonk W, et al. The prevalence of anti-thyroid peroxidase antibodies and autoimmune thyroiditis in children and adolescents in an iodine replete area. *Eur J Endocrinol*. 2003 Mar;148(3):301-7.
3. Hughes JW, Riddlesworth TD, DiMeglio LA, Miller KM, Rickels MR, McGill JB, et al. Autoimmune Diseases in Children and Adults With Type 1 Diabetes From the T1D Exchange Clinic Registry. *J Clin Endocrinol Metab*. 2016;101(12):4931-7.

## Contact

Liisa Saare  
Children's Clinic of Tartu University Hospital  
Tartu, Estonia  
liisa.saare@kliinikum.ee