

Introduction

- The prevalence of thyroid peroxidase antibody (TPOAb) positivity is estimated to be around 1-4% in healthy children (dependant on measuring methods) and is remarkably higher in children with type 1 diabetes (T1D)¹.
- However, TPOAb positivity in children with HLA-conferred susceptibility to T1D who are not yet diagnosed with T1D, is not well studied.

Objectives

- To describe the prevalence of positive TPOAb and it's effect of thyroid function in children who have a genetic susceptibility to type 1 diabetes.

Methods

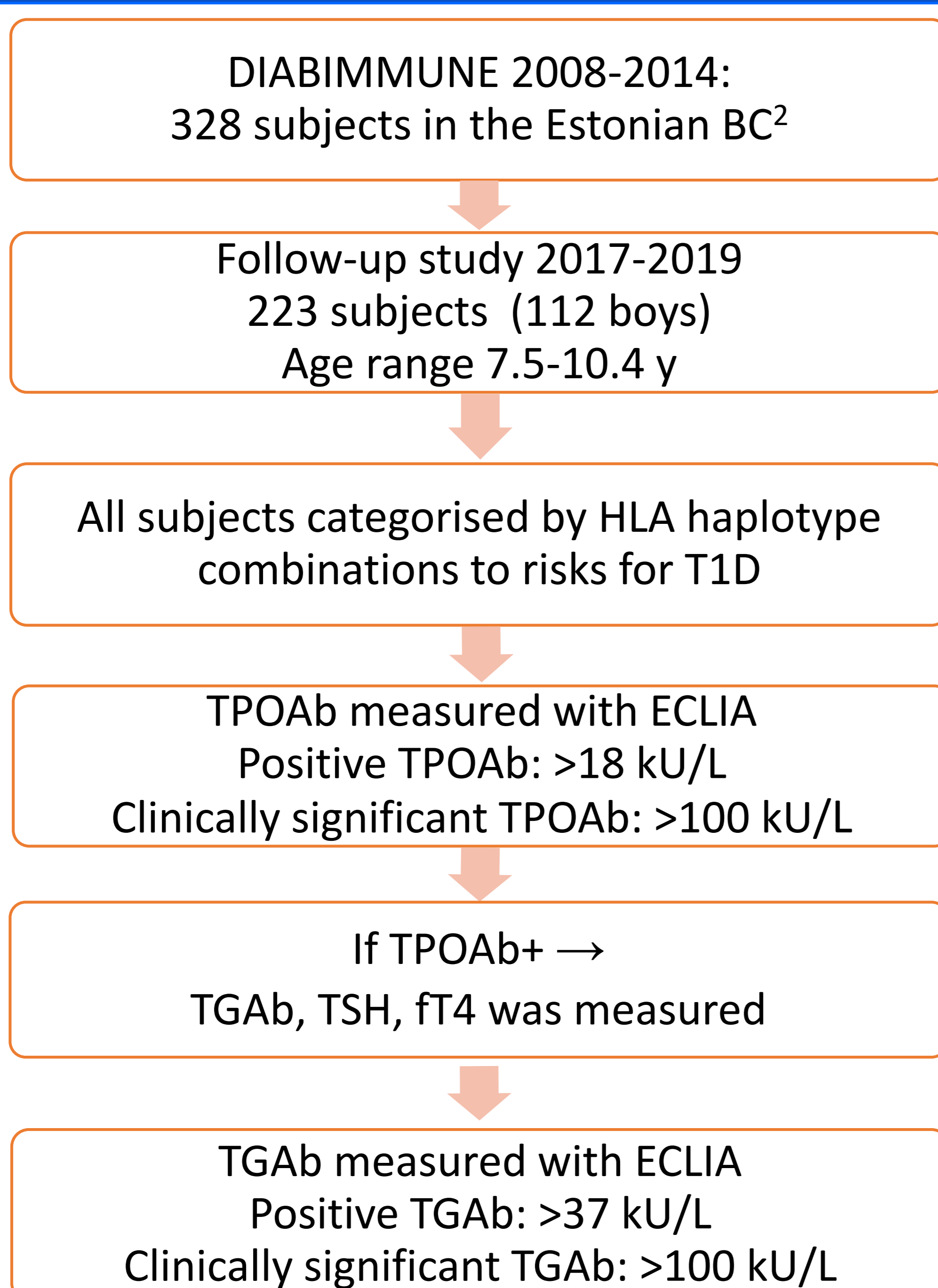


Figure 1. Study design

- None of the subjects had a known history of thyroid disease, 4 had developed T1D from the beginning of DIABIMMUNE.
- Diabetes associated antibodies (DAAB) were measured (IAA, IA2A, GADA, ZnT8A and ICA when one of the previous was positive) in all subjects.
- Risks for T1D based on subjects' HLA haplotype combinations:
 - high risk for T1D: DR3-DQ2/DR4-DQ8 genotype;
 - moderate risk for T1D: DR4-DQ8/X genotype (X= a non-protective allele, but not DR3-DQ2);
 - low risk for T1D: DR3-DQ2/Y genotype (Y= a non-protective allele, but not DR4-DQ8).
- Statistical analysis was performed with R Console version 3.5.3.
- Mann-Whitney and Kruskal-Wallis test were used to compare groups, $p < 0.05$ was considered statistically significant.

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Results

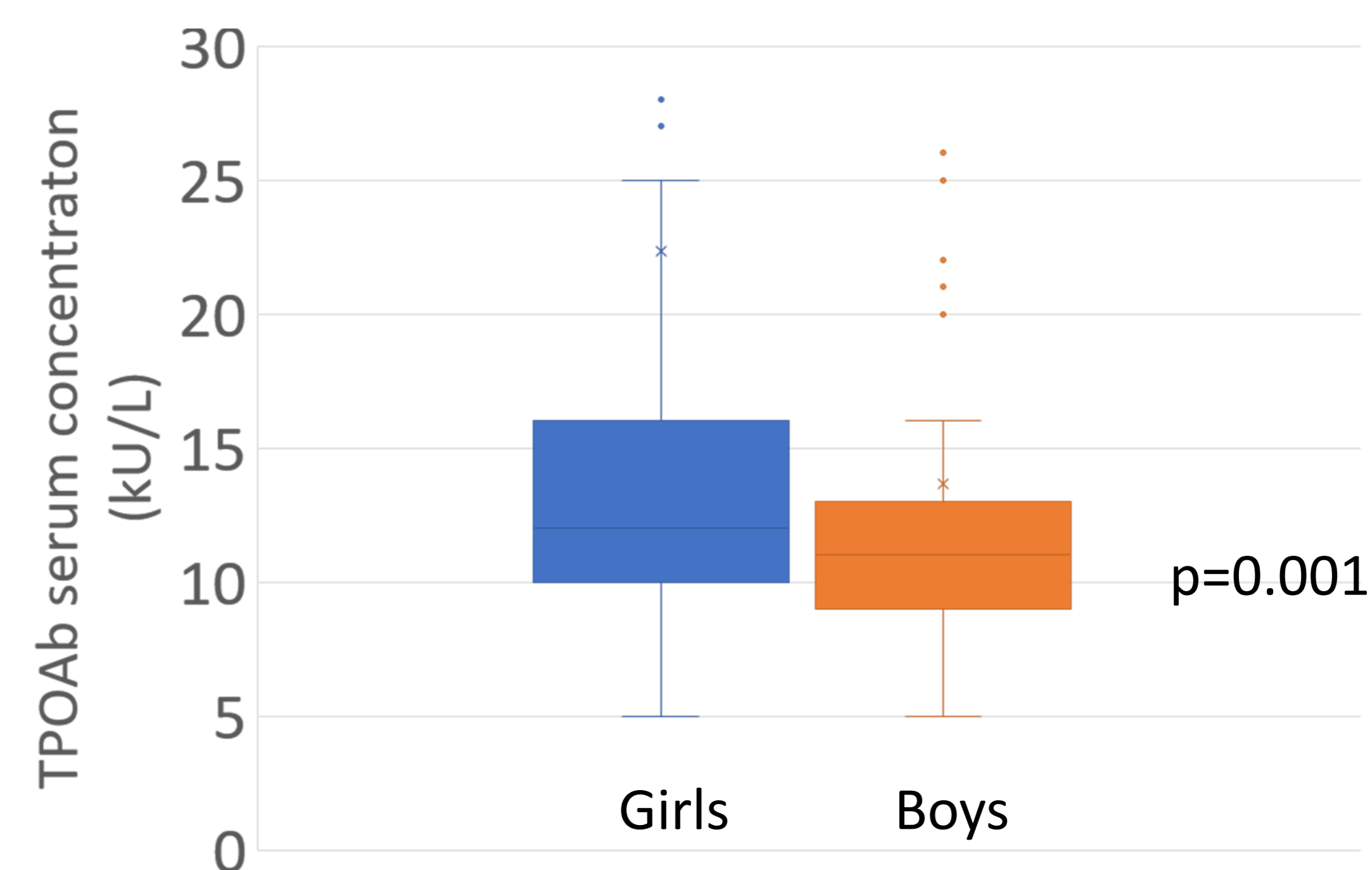


Figure 2. Comparison of median TPOAb levels by sex

- Positive TPOAb occurred in 31 subjects (20 girls), that is 13.9% of the cohort.
- Girls with positive TPOAb had a higher median TPOAb value (27.5 vs 25 kU/l, $p=0.001$).
- Four subjects (1.8%) had TPOAb levels >100 kU/l (3 girls).
- TGAb was measured in 30 children:
 - positive TGAb occurred in 9 children (7 girls);
 - TGAb >100 kU/L was found in 6 subjects (4 girls).
- Changes in thyroid function was found in only 2 children:
 - a 10 yo girl with a mildly elevated TSH and normal fT4
 - A 9 yo boy with a slightly elevated fT4 and a normal TSH

Table 1. Positive and clinically significant TPOAb and TGAb values by different HLA risk groups

	Low risk HLA	Moderate risk HLA	High risk HLA	Total
No of subjects	108	94	21	223
TPOAb (n)				
19 kU/L -100 kU/L	11	12	4	27
>100 kU/L	2	1	1	4
TGAb (n)				
38 - 100 kU/L	0	2	1	3
>100 kU/L	3	3	0	6

- In TPOAb positive subjects median TPOAb concentration did not differ between the risk groups for T1D ($p=0.54$).
- Only one of the 31 subjects had a positive DAAB—IAA.

Conclusions

- Girls had higher TPOAb compared with boys.
- The prevalence of positive TPOAb levels in our cohort was 13.9%, which is remarkably higher than previously described prevalence in healthy children.
- However, only 2 children had a change in thyroid function.
- Therefore, in children with HLA-conferred susceptibility to T1D, routine TPOAb measuring is not justified, at least up to ten years of age.

References

1. Jonsdottir B, Larsson C, Lundgren M, Ramelius A, Jönsson I, Larsson HE, et al. Childhood thyroid autoimmunity and relation to islet autoantibodies in children at risk for type 1 diabetes in the diabetes prediction in skåne (DiPiS) study. *Autoimmunity*. 2018 Aug;51(5):228–37.
2. Peet A, Hämäläinen A-M, Kool P, Ilonen J, Knip M, Tillmann V, et al. Circulating IGF1 and IGFBP3 in relation to the development of β -cell autoimmunity in young children. *Eur J Endocrinol*. 2015 Aug;173(2):129–37.