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

DIABIMMUNE 2008-2014: 328 subjects in the Estonian BC\(^2\)

Follow-up study 2017-2019 223 subjects (112 boys)
Age range 7.5-10.4 y

All subjects categorised by HLA haplotype combinations to risks for T1D

TPOAb measured with ECLIA
Positive TPOAb: >18 kU/L
Clinically significant TPOAb: >100 kU/L

If TPOAb+ →
TGAb, TSH, fT4 was measured

TGAb measured with ECLIA
Positive TGAb: >37 kU/L
Clinically significant TGAb: >100 kU/L

Results

• 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

<table>
<thead>
<tr>
<th>Low risk HLA</th>
<th>Moderate risk HLA</th>
<th>High risk HLA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of subjects</td>
<td>108</td>
<td>94</td>
<td>21</td>
</tr>
<tr>
<td>TPOAb (n)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 kU/L - 100 kU/L</td>
<td>11</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>&gt;100 kU/L</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>TGAb (n)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38 - 100 kU/L</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>&gt;100 kU/L</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

• 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