Zinc is essential for human health due to its unique role in multiple biological processes including promoting immunity, growth, development and reproduction. Zinc has a key role in all cell types for the maintenance of cellular metabolism and gene expression, as well as catalyzing and regulating numerous cellular processes. Cytoplasmic zinc homeostasis is regulated by zinc-transporter proteins (ZnTs), which are products of the SLC30 gene. To date, 10 ZnT family members (ZnT1-ZnT10) have been identified. ZnTs are expressed in endocrine glands and this suggests that they play a role in regulating zinc concentration in endocrine cells. ZnT8 is a pancreatic islet cell secretory granule membrane protein which is essential for regulating insulin synthesis and secretion. In addition, ZnT8 is an islet cell autoantigen in type 1 diabetes mellitus (T1DM). Autoantibodies (Abs) to ZnT8 (ZnT8Abs) together with autoantibodies to insulin (IAbs), glutamic acid decarboxylase (GADAbs) and protein tyrosine phosphatase 11B (IA2Abs) are markers of autoimmune diabetes mellitus.

**Material and Methods**

The study group consisted of 44 patients with Graves’ disease (GD) (mean age, 14.8 ± 3.1 years; 27% male and 73% female), 65 patients with Hashimoto’s thyroiditis (HT) (mean age, 13.3 ± 3.3 years; 12% male and 88% female) and 199 patients with T1DM (mean age, 12.5 ± 4.2 years; 47% male and 52% female) who were hospitalized between 2012 and 2015 in pediatric hospitals in Poland. The control group was recruited from children hospitalized with suspicion of mild heart diseases, but discharged from hospital with diagnoses of functional murmurs or non-cardiovascular syncopes. Serum samples from 58 children (mean age, 13.3 ± 3.5 years; 57% male and 43% female) who had no autoimmune conditions and no family history of autoimmunity were included in the control group.

On the day of sample collection, fasting venous blood was drawn, serum separated and stored at −80°C.

**ZnT8Abs** were measured by enzyme-linked immunosorbet assay (ELISA) using kits from RSR Ltd. (Cardiff, UK, www.rsrtd.com) and values of ZnT8Abs >15 units/mL were considered positive.

**GADAbs** were measured by ELISA using kits from RSR Ltd and values of GADAb ≥5.0 were positive.

**IA-2Abs** were measured using an immunoprecipitation assay (IPA) based on 1251-labeled IA-2 using kits from RSR Ltd. IA-2Abs levels >125 WHO units/mL were considered positive.

**IAbs** were measured using an IPA based on 125I-labeled insulin using kits from RSR Ltd. IAb levels ≥0.4 units/mL were considered positive.

**Serum 21-hydroxylase autoantibodies (21-OHAbs)** were measured by an IPA based on 125I-labeled recombinant 21-OH using kits from RSR Ltd. 21-OHAbs levels >1.0 unit/mL were considered positive in the assay according to the kit instructions.

**Acetylcholine receptor autoantibodies (AChRAbs)** were measured by using kits from RSR Ltd. and values ≥0.5 nmol/L were considered positive.

**TPOAbs, TgAbs and TRAbs** were measured by ECLIA using a Modular Analytics E170 analyzer (Roche Diagnostics). The normalvalues were 0–34 IU/mL for TPOAb, 0–115 IU/mL for TgAb and 0–1.75 IU/L for TRAb.

**Conclusions**

Overall, our study showed that diabetes-associated autoantibodies including ZnT8Ab were found in children and adolescents with GD and HT, and future studies should be carried out to better understand the pathogenesis of the co-occurrence of thyroid and diabetes autoimmunity.