

# Thyroid Disorders and autoimmunity in Children and Adolescents with Type 1 and type 2 Diabetes mellitus

Ashraf Soliman, Fawzia Alyafei, Fawziya Alkhalaf, Reem Wassef, Nagwa AlDarsy  
Hamad General Hospital, Doha, Qatar

## Introduction

Hypothyroidism is prevalent among pediatric patients with T1DM and is associated with a more aggressive form of the disease.

Patients with T1DM and hypothyroidism have higher rates of DKA, develop the disease at younger ages, and require higher insulin doses.

T2DM patients are also more prone to thyroid disorders.

The prevalence of thyroid dysfunction in adults with T2DM patients was reported to be 12.3% in Greece and 16% in Saudi Arabia and has been reported to be associated with insulin resistance.

The prevalence of thyroid disorders and autoimmunity has not been reported in children with T2DM.

We report the thyroid status and autoimmunity in children and adolescents with T1DM and T2DM diagnosed between 2012 and 2016 in Doha, Qatar investigated during their first presentation.

## Patients and methods

This was a cross sectional descriptive study to determine the thyroid function (Free thyroxine (FT4) and TSH) and anti-thyroid peroxidase antibody (ATPO) in a cohort of children and adolescent (aged 2-16 years) with T1DM ( n= 396) and compare them with those for children with non-familial T2DM ( n = 50 ) at their first presentation at Hamad General Hospital

## Results

At first presentation, children and adolescents with T2DM had similar prevalence of hypothyroidism compared to children with T1DM.

Children with T2DM had higher prevalence of subclinical hypothyroidism and ATPO positivity versus T1DM children.

## Autoimmune markers in T1DM vs T2DM

	T1DM	T2DM
Number of patients	396	50
T4 (<11 pmol/L)	10.6%	10 %
TSH (5.6-10 U/ml)	3.5%	8%*
TSH (>10U/ml)	2.5%	6 %*
TPO (>100 IU/ml)	27.2%	34.6%*
TPO (>100IU/ml) + NL TFT	22.7%	23.1%
TPO (>100IU/ml) and T4 <11pmol/L ) or TSH >10U/ml)	3.4 %	7.7%*
TPO (>100) + subclinical (TSH 5.6-10)	7.29 %*	3.8 %
TPO (<100) +hypothyroid (T4 <11 or TSH >10)	6.64 %	7.7 %

## Autoimmune markers in T1DM vs T2DM in different studies

Studies/country	Number of children with T1DM	High Anti-TPO	Subclinical / Overt hypothyroidism	Anti-tissue transglutaminase (AAT)
Our Study / (Qatar)	352	27.2%	3.5% + 6.6%	5%
Ardestani SA / (Iran)	83	19.3%	19.3%	21.7%
Mantovani RM / Brazil	383	16.7%	7.2%	ND
Jung ES / Korea	98	26%	ND	22.2%
Orzan A / Romania	256	18.3 %	0%	ND
Kakleas K / Greece	47	14.8%	0% at the diagnosis	ND
			0% at the diagnosis	

ND = not reported

Our study documents higher prevalence of autoimmune thyroid disorders in children and adolescents with T2DM

## Conclusions

Children and adolescents with both T1DM and T2DM had significantly higher risk to develop hypothyroidism.

Early detection of thyroid dysfunction in children with type 2 diabetes mellitus should be performed routinely, given the high rate of newly diagnosed cases.

## Contact

Ashraf Soliman MD PhD  
Department of Pediatrics  
Hamad General Hospital  
Doha, Qatar  
Atsoliman@yahoo.com

