Original Article

A Study Of Prevalence Of Thyroid Dysfunction In Type 1 Diabetic Children In A Tertiary Care Hospital From A Sub-Urban Population

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Abstract

Background: Type 1 diabetes mellitus (T1DM) is an autoimmune disease resulting in insulin deficiency[1]. This also predisposes these individuals to other autoimmune diseases such as thyroid disease,[2] celiac disease and adrenal insufficiency. Our study focus on thyroid changes in type1 diabetic children in Indian population .

Aim: To assess the prevalence of thyroid dysfunction in type 1 diabetic children in a tertiary care hospital from a sub-urban population.

Materials and Methods: It is a cross sectional study done on 142 children with type 1 diabetes attending pediatric OPD . All necessary investigations were done and data were collected .

SPSS 24was used for statistical analysis of results

Results:

Higher prevalence of thyroid dysfunction was seen in children with type 1 diabetes in our study .

Conclusion:

The reason for hypothyroidism in type 1 diabetics is mostly auto-immune origin. So screening of thyroid function and thyroid antibodies is very important in all type 1 diabetic children for better prognosis and prompt treatment.

Keywords: Autoimmune, Diabetes mellitus,thyroiditis,hyperthyroidism,

Introduction:

Diabetes mellitus-Type 1 is of autoimmune type resulting in insulin deficiency[1]. There is a genetic predisposition towards T1DM. This also predisposes these individuals to other autoimmune diseases such as thyroid disease, celiac disease and adrenal insufficiency. Of all the above mentioned diseases, thyroiditis of autoimmune type (AIT) is the most frequently encountered.[2,3].AIT(Autoimmune thyroiditis) in general is clinically silent but it may progress to overt or subclinical hypothyroidism or hyperthyroidism[4] . When compared to the general population the positivity of anti-thyroid antibodies was found to range from 2.9% - 3.4%[5,6]while in T1DM children it was between 18.5% - 24.6%.[7] In T1DM children with normal thyroid function, the T3 and TSH levels may be strongly influenced by the glucose levels. Very less studies only shows correlation between type 1 diabetics and thyroid dysfunction so our study tries to highlight this in Indian population

Need for the study: In view of scarcity of studies on thyroid dysfunction in type 1 diabetic children from Indian population .

Objectives of the study:

To assess the prevalence of thyroid dysfunction in type 1 diabetic children in a tertiary care hospital from a sub-urban population

Materials and Methods: This was a cross sectional study done in Department of Pediatrics in Meenakshi Medical College Hospital and Research Institute, a tertiary care teaching hospital located in Enathur, Kanchipuram.After getting necessary permission and ethical committee clearance,a total of 142 children diagnosed with TYPE 1 diabetes were selected in our study group , investigations like complete thyroid profile , lipid profile, HbA1c were done in all patients . Data was collected . Statistical analysis was done using SPSS24.

Tools used: Thyroid profile , TPO antibodies, HBA1C

Results:

Table I- Risk factors associated with auto antibody positivity in T1DMchildren

	P value	OR	95% CI
Sex	0.229	0.104	0.029-0.376
Cholesterol	O.057	7.827	0.940-65.197
Triglycerides	0.553	0.361	0.012-10.488
Cholesterol and Triglycerides	0.023	6.003	3.454-8.491
HbA1C	0.482	2.225	0.239-20.670
Goitre	0.003	4.044	2.001-5.992
Ultrasound	0.003	5.84	4.802-5.920

In our study it was observed that there was a increased frequency of autoimmune thyroiditis in type 1 DM children and there was P value<0.05, which was statistically significant- chi square test.

Table II. TG(Triglyceride) positivity

	P value	OR	95% CI
Sex	0.154	8.432	0.449-158.38
Cholesterol	O.499	2.356	0.197-28.259
Triglycerides	0.520	0.244	0.003-17.941
Cholesterol and Triglycerides	0.884	0.682	0.002-1.043
HbA1C	0.354	1.234	0.008-1.432
Goitre	0.002	4.470	3.04-6.558
Ultrasound	0.002	5.168	4.056-6.091

Increased triglyceride levels were associated with autoimmune thyrodits and there was $P < 0.05$, which was statistically significant- chi square test

Discussion: Total 142 children diagnosed with TYPE 1 diabetes were selected in our study group.. The prevalence of positivity for anti-TPO Antibodies, anti-Tg antibody, and the prevalence of positivity for both antibodies and AIT (at least one positive antibody) in children with T1DM were 21%,14%,13% and 22.5% respectively . T1DM were observed to have both raised anti-TPO and anti-Tg antibodies. It may be due to a increased tendency to act against specific antigens, or loss of self recognition particularly when there is genetic or environmental trigger.Similar findings were seen in studies done by Kordonouri.[7] Kordonouri study showed 21.6% had elevated titres of atleast one thyroid antibody.Our study also showed that increased duration of type 1 diabetics also raises the risk of Auto immune thyroiditis.Kordonouri study also showed that the antibody titres increased with age which is similar to our study.

Most studies that have reported low prevalence of AIT were conducted 10-20 years ago,which shows the low sensitivity of the lab tests. Meanwhile, this finding might also be a result of increase in the prevalence of AIT during the recent decades Along with increasing T1DM cases.From previous studies the prevalence of clinical and subclinical thyroid dysfunction in T1DM patients is suggested to be 13.4-20% (40) whilst the prevalence of hypothyroidism and hyper-thyroidism in the normal population is 5-10% and 1%,respectively.Therefore, the higher prevalence of subclinical hypothyroidism in T1DM patients could be explained by the high prevalence of AIT (22.5%) in these patients.Diagnosis of Goitre was made by inspection and palpation and confirmed by ultrasonography.

In TIDM(Type 1 Diabetes mellitus) children with AIT(Autoimmune Thyroiditis), there is significant elevation in lipid parameters including both cholesterol and triglycerides which is similar to other studies

Limitations: 1.Small sample size

2.Iodine status of diabetic children was not estimated

Conclusion: Screening for thyroid disease in Type 1 DM(Diabetes mellitus) should be at the diagnosis preferably anually i.e; TSH levels should be measured.The levels of Triglycerides increases the morbidity in the affected children.

Sources of Support: Nil

Conflicts of interest: Nil

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