STUDY OF CHILDREN WITH TYPE 1 DIABETES MELLITUS OF LONG DURATION ATTENDING ALEXANDRIA UNIVERSITY CHILDREN'S HOSPITAL

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Introduction

Type 1 diabetes mellitus (T1DM) is a complex metabolic disorder typically diagnosed in childhood and characterized by insufficient insulin production. It mostly results from T cell-mediated destruction of the pancreatic β cells and is due to interactions between environmental and genetic factors. [(1)]

Diabetic complications constitute the main cause of morbidity and mortality in diabetic patients despite the advances in T1DM treatment. These complications can be divided into two major categories: acute complications, including diabetic ketoacidosis (DKA) and hypoglycemia, and chronic complications including microvascular complications as nephropathy, neuropathy and retinopathy; and macrovascular complications as coronary artery disease and peripheral vascular disease due to the effects of hyperglycemia and dyslipidemia on vascular endothelial function.[(2)]

Objectives

The aim of this work was to study children with T1DM of long duration, attending the diabetes clinic of AUCH; with regard to adequacy of treatment and presence of complications.

Methods

This observational study was conducted on fifty children and adolescents with T1DM of long duration ≥5 years,attended the diabetes clinic of the AUCH. Excluding patients with associated chronic diseases other than diabetes, intake of corticosteroids for any reason in the last 3 months and patients with documented hypertension or renal impairment before the onset of diabetes. We investigated the presence of diabetic complications and their relation with the glycemic control, duration of diabetes and the age at diagnosis.

All the patients were subjected to:

• full history taking and physical examination

•laboratory investigations : HbA1c, eGFR, microablumnuria, complete liver profile, lipid profile, celiac antibodies, thyroid profile,

•Radiologicalinvestigation: ultrasound abdomen, fundus examination and echocardiography &nerve conduction study for indicated cases.

Results

Table 1: Demographic data of the 50 diabetic patients at enrollment in the study

	No.	%
Sex		
Males	**29**	**58.0**
Females	**21**	**42.0**
Age (years)		
Min. – Max.	**6.60 – 16.0**	
Mean ± SD.	**11.89 ± 2.46**	
Onset of DM (years)		
Min. – Max.	**0.58 – 9.0**	
Mean ± SD.	**4.74 ± 2.25**	
Duration of DM (years)		
Min. – Max.	**5.0 – 13.0**	
Mean ± SD.	**6.98 ± 2.10**	
First presentation		
DKA	**33**	**66.0**
Classical symptoms	**17**	**34.0**
DKA attacks	**43**	**86.0**
Min. – Max.	**1.0 – 10.0**	
Mean ± SD	**2.91 ± 2.97**	
PICU admissions	**33**	**66.0**
Min. – Max.	**1.0 – 10.0**	
Mean ± SD	**1.88 ± 1.82**	
Hypoglycemic episodes	**7**	**14.0**
Min. – Max.	**1.0 – 1.0**	
Mean ± SD	**1.0 ± 0.0**	

Table 2: Relation between the glycemic control (HbA1c%), and frequency of chronic complications (of DM and insulin therapy) and associated autoimmune diseases (n = 50)

Complications & associated diseases	HbA1c (%) Good (<7.5) (n = 5)		Fair (7.5–9) (n = 10)		Poor (>9) (n = 35)		χ^2	^{MC}p
	No.	%	No.	%	No.	%		
Lipodystrophy								
Present	1	20.0	7	70.0	25	71.4	4.744	0.078
Absent	4	80.0	3	30.0	10	28.6		
Fatty liver								
Present	2	40.0	5	50.0	19	54.3	0.494	0.905
Absent	3	60.0	5	50.0	16	45.7		
Dysplidemia								
Present	1	20.0	5	50.0	10	28.6	1.935	0.486
Absent	4	80.0	5	50.0	25	71.4		
Nephropathy								
Present	0	0.0	0	0.0	9	25.7	3.734	0.178
Absent (normal abluminuria)	5	100	10	100	26	74.3		
Hypothyrodism								
Present	0	0.0	2	20.0	4	11.4	1.082	0.630
absent	5	100	8	80	31	88.6		
Neuropathy								
Present	1	20.0	0	0.0	3	8.6	1.890	0.492
Absent	4	80.0	10	100.0	32	91.4		
Celiac disease								
Present	0	0.0	0	0.0	3	8.6	0.713	1.000
Absent	5	100	10	100	32	91.4		

χ^2: **Chi square test** for comparing between the three categories
^{MC}p: p value for **Monte Carlo** for Chi square test for comparing between the three categories

Table 3: Relation between the duration of DM, and frequency of chronic complications (of DM and insulin therapy) and associated diseases (n=50)

Complications & associated diseases	N	Duration of DM(years) Min. – Max.	Mean ± SD.	U	p
Lipodystrophy					
Present	**33**	5.0 – 13.0	6.99 ± 2.13	280.50	1.000
Absent	**17**	5.0 – 11.0	6.97 ± 2.10		
Fatty liver					
Present	**26**	5.0 – 11.0	6.95 ± 2.09	309.50	0.960
Absent	**24**	5.0 – 13.0	7.02 ± 2.15		
Dysplidemia					
Present	**16**	5.0 – 11.0	7.0 ± 2.10	271.0	0.983
Absent	**34**	5.0 – 13.0	6.97 ± 2.32		
Nephropathy					
Present	**9**	5.0 – 13.0	7.60 ± 2.58	151.0	0.386
Absent (normal abluminuria)	**41**	5.0 – 11.0	6.84 ± 1.99		
Hypothyrodism					
Present	**6**	5.0 – 6.0	5.33 ± 0.52	142.50	0.709
Absent	**44**	5.0 – 13.0	7.20 ± 2.13		
Neuropathy					
Present	**4**	5.0 – 8.0	6.0 ± 1.41	65.50	0.332
Absent	**46**	5.0 – 13.0	7.07 ± 2.14		
Celiac disease					
Present	**3**	5.0 – 8.0	6.0 ± 1.73	47.0	0.325
Absent	**47**	5.0 – 13.0	7.04 ± 2.12		

U, p: U and p values for **Mann Whitney test** for comparing between the two categories

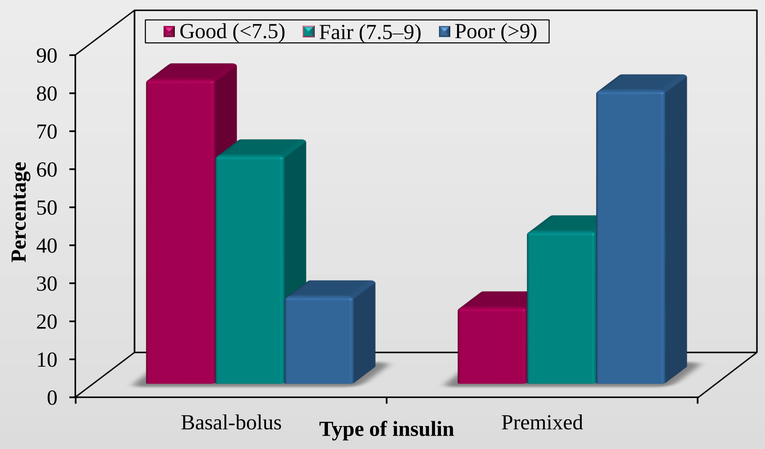

Figure (1):Relation between HbA1c percentage and type of insulin therapy (n = 50)

Conclusions

•The use of basal bolus insulin therapy is much more beneficial for the patients for achieving good glycemic control to prevent complications and decrease morbidity and mortality.
•Regular screening for early detection of diabetic complications is a must.
•Routine Screening for other associated autoimmune diseases.
•Careful physical examination including insulin sites to avoid lipodystrophy.

References

[1]American Diabetes Association. Diagnosis and classification of diabetes mellitus. Diabetes Care 2015; 38:S8-16

[2]. Melendez-Ramirez LY, Richards RJ, Cefalu WT. Complications of type 1 diabetes. Endocrinol Metab Clin North Am 2010; 39(3):625-40.