Psychological Assessment of a Sample of Egyptian Children and Adolescents with type 1 diabetes

Thesis

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List of Abbreviations

Abb.	Full term
ADA	American Diabetes Association
ADHD	Attention- deficit/hyperactivity disorder
BMI	Body mass index
CDC	Centers for Disease Control and Prevention
CGM	Continuous glucose monitoring
CGMS	Continuous glucose monitoring systems
CNS	Central nervous system
DACH	Division of Adult and Community Health
DEMPU	Diabetes, Endocrine and Metabolism Pediatric Unit.
DKA	Diabetic ketoacidosis
DSM	Diagnostic and Statistical Manual of Mental
EEG	Electroencephalography
HbA1c	Hemoglobin A1c
HCFA	Health Care Financing Administration
HEDIS	Health Plan Employer Data and Information Set
HLA	Human leukocyte antigen
HRQOL	Health Related Quality of Life
LADA	Latent autoimmune diabetes in adults
MCS	Mental Component Summary
MDI	Multiple daily injections
MODY	Maturity-onset diabetes of the young
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NPH	Intermediate-acting
PCS	Physical Component Summary

List of Abbreviations Cont...

Abb.	Full term
QOL	Quality of life
SMBG	Self-monitoring of blood glucose
SNRIs	Serotonin–Norepinephrine Reuptake Inhibitors
SSRIs	Selective serotonin reuptake inhibitors
T1DM	Type 1 Diabetes Mellitus
T2DM	Type 2 diabetes mellitus
TCAs	Tricyclic Antidepressants
WHO	World Health Organization

INTRODUCTION

Diabetes, one of the most common metabolic disorders, and one of the main public health concerns globally. The prevalence of diabetes varies between countries as well as between age groups ***(Kliegman et al., 2007)***. Type 1 Diabetes Mellitus (T1DM) is the most common type of diabetes in children and sometimes requires several insulin injections per day. Consequently, children who need multiple daily injections are exposed to traumatic experiences. Many children avoid injections, which in turn, results in a high treatment failure rate in this age group ***(Cemeroglu et al., 2015; Setoodeh et al., 2012).***

Besides the damaging effects of diabetes on various organs, cognitive changes are also very common and include changes in memory, executive function, attention and academic performance, and are among the most important impairments seen in children with diabetes. In addition to physical growth, social and emotional development is important and stimulated by formal education and schooling. Therefore, any health condition which might impact on cognitive function could, in turn, affect other areas of child development including cognitive, social and emotional development ***(Brown, 2004).*** Children with diabetes have been shown to have lower levels of intelligence compared to children without diabetes ***(Hannonen et al., 2003; Northam et al., 2009).*** In addition, there is an association between hypoglycemic episodes and memory changes in children with diabetes ***(Hershey et al., 2005).***

The basic mechanism through which diabetes affects academic performance is not yet known. One suggestion is that diabetes causes academic disadvantage in children through absenteeism, which consequently results in different cognitive and learning impairments ***(Wodrich et al., 2011).*** However, other researchers believe that diabetes can induce cognitive malfunction by affecting the central nervous system (CNS) and neural structures ***(Bober et al., 2005).***

The prevalence of psychological disorders among diabetic children was higher than that of the others. As psychological disorders will affect the life quality of children, improvement of life quality of diabetic children and adolescents, on-time diagnosis and treatment of psychological disorders in these patients seems essential ***(Zahed et al., 2018).*** Compared with the healthy children, the HRQOL was lower among children and adolescents with T1DM. Lower HbA1c was associated with better quality of life ***(Samardzic et al., 2016)***

Children with diabetes suffer from ADHD significantly more frequently than children without diabetes ***(Kapellen et al., 2016).***Pediatric patients with ADHD and T1DM showed poor metabolic control compared to T1DM patients without ADHD. Closer cooperation between specialized pediatric diabetes teams and pediatric psychiatry/psychology seems to be necessary to improve diabetes care and metabolic control in this group of patients ***(Hilgard et al., 2017).***

Aim of the Work

The aim of this work is to do psychological assessment of children and adolescents with type 1 diabetes at Ain Shams University pediatrics hospital including Health Related Quality of life assessment and DSM-5 criteria for diagnosing ADHD.

Chapter 1

DIABETES MELLITUS

Diabetes mellitus is a disorder of the metabolic homeostasis controlled by insulin, resulting in abnormalities of carbohydrate and lipid metabolism. Type 1 diabetes (also called juvenile-onset diabetes mellitus and insulin-dependent diabetes mellitus) is caused by an absolute insulin deficiency caused by immune-mediated destruction of insulin producing beta cells in the pancreas ***(Atkinson et al., 2014).***

Type 2 diabetes mellitus is characterized by two underlying defects. The earliest abnormality in an individual who develops type 2 diabetes mellitus is insulin resistance, which initially is compensated for with an increase in insulin secretion. Type 2 diabetes mellitus then develops due to a defect in insulin secretion that prevents such secretion from matching the increased requirements imposed by the insulin-resistant state. Thus, diabetes mellitus always is caused by insulin deficiency: in type 1 diabetes mellitus, the deficiency is absolute; in type 2 diabetes mellitus, the deficiency is relative.

Although the percentage of cases of diabetes in children and adolescents caused by type 2 diabetes has risen in the past 1 to 2 decades type 1 diabetes remains the most common form of diabetes mellitus in children ***(Chase et al., 2003).***

Epidemiology

Type 1 diabetes accounts for about 5% to 10% of all patients with diabetes. It is the most commonly diagnosed diabetes of youth (under 20 years of age) and causes ≥85% of all diabetes cases in this age group worldwide ***(Maahs et al., 2010).***

There is significant geographic variation in the incidence of type 1 diabetes ***(Adeloye et al., 2018).***

Worldwide, the incidence of type 1 diabetes is increasing by 3% every year, although the reasons for this are unclear ***(Adeloye et al., 2018).***

Reports showed a more rapid increase in nonwhite racial and ethnic groups ***(Mayer et al., 2012)***

Type 1 diabetes can present at any age, with the highest incidence observed in children aged 10-14 years. It affects males and females equally ***(Maahs et al., 2010).***

Diabetes prevalence in some Eastern Mediterranean countries is among the highest in the world. The highest rates are reported in Egypt, Kuwait, Lebanon, Oman and Qatar where the incidence of type 1 diabetes is reported to be 8-10 per 100 000 population per year in children aged <15 years ***(WHO, 2006).***