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Screening for Psychological Impairment in children with Type I Diabetes

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Summary

Background; Type-1-DM is a form of diabetes mellitus that results from autoimmune destruction of insulin-producing beta cells of the pancreas, it is typically diagnosed in childhood, adolescence, or early adulthood. As a chronic disease, it is usually complicated with psychological challenges, as changes induced by the onset of type (1) DM may be detected: at the biological as well as emotional level. Guidelines recommend, that psychological screening should generally be a routine part of diabetes management.

Aim of the study; This study investigated the role of routine psychological screening in helping diabetes children to obtain better health related quality of life and better compliance.

Methodology; It is a cross sectional study including 124 diabetic children attending endocrinology clinic in National Institute of Diabetes from March 2011 till March 2012. Full history taking and Mini International Neuropsychiatric Interview- kid were carried after informed consent of the caregiver.

Results; As regards mood disorders, 4 (3.2%) children had MDD, 8 (6.5%) children had Dysthymia, 4 (3.2%) experienced suicidal attempts and .., no one had symptoms suggestive of hypomania. Regarding eating disorders, 12 (9.68%) children suffered from symptoms suggestive of anorexia. .., statistically highly significant difference between males and females was found regarding age ($p= 0.000$) and illness duration.

Conclusion; The term diabetes complications should encompass psychological ill health seen in the young. Complication screening programs should include a mental health Component, potentially with screening from the point of diabetes diagnosis." The MINI Kid has been widely used to diagnose depression in community-based adolescents.

Key words: DM type- (1) screening, psychiatric MINI- KID mood disorders

مسح للأضطرابات النفسية في الأطفال مرضي السكر

الخلفية: لقد لوحظ زيادة نسبة الأمراض النفسية في الأطفال والمراهقين المصابين بالسكر كما هو الحال في الأطفال ذوي الأمراض المزمنة الأخرى ويتمثل رد الفعل النفسي الأول للسكر في: الحزن والقلق والأنسحاب والاعتمادية وحوالي 30% من الأطفال يصابون بهذه الأعراض التي عادة ما تتحسن في خلال السنة الأولى من الإصابة ولكن عدم وجود وسائل للتأقلم مع المرض خلال هذه الفترة يضع الأطفال في خطر حدوث المزيد من المشاكل النفسية ومن المشاكل النفسية الأخرى مرضي السكر القلق من (9-19%) كما يتعرض المراهقين المصابين بالسكر وخاصة الفتيات لخطر أمراض اضطرابات الأكل بنسبة تصل إلى 10% وأخيراً فإن نسبة المشاكل النفسية في الأطفال مرضي السكر مرتفعة بالفعل، كما إن بعض الدراسات تؤكد أن المشاكل النفسية في الطفولة من الممكن أن تستمر إلى مراحل عمرية متقدمة.

الغرض من الدراسة: التأكيد على أن هذه المشكلات النفسية لها تأثير قوي على التحكم في مرض السكر نفسه وبالتالي المضاعفات المتوقعة من المرض.

المنهجية: وقد كانت الدراسة دراسة مقطعية ووصفية وتم استخدام إستمارة التاريخ المرضي والكشف الأكلينيكي على المريض وإختبار المينيكيدي للمرضي وكان عدد المرضي الذين تم مناظرتهم (400) مريض منهم (124) مريض تطابق مع شروط البحث وتبين من الدراسة معاناة 4 أطفال (3.3%) من أعراض الاكتئاب وأوضحت النتائج وجود اختلاف ذات دلالة إحصائية عالية بين الذكور والإناث فيما يتعلق بالعمر ($P=0.000$) ومدة المرض كما وجد اختلافاً توجد فروق إحصائية فيما يتعلق بنسبة السكر في الدم للصابغ وبعد ساعتين من الإفطار، ونسبة الهيموجلوبين السكري، والمضاعفات.

النتائج: تباينت من الدراسة معاناة 4 أطفال (3.3%) من أعراض الاكتئاب، وأوضحت النتائج وجود إختلافات ذات دلالة إحصائية بين الذكور والإناث فيما يتعلق بالعمر ($P=0.000$) ومدة المرض كما وجد أنه لا توجد فروق إحصائية فيما يتعلق بنسبة السكر في الدم للصابغ وبعد ساعتين من الإفطار، ونسبة الهيموجلوبين السكري، والمضاعفات.

الخلاصة: المشاكل النفسية في الأطفال مرضي السكر متعددة ومن الممكن أن تستمر إلى مراحل عمرية متقدمة كما أن لها تأثير قوي على التحكم في مرض السكر نفسه والمضاعفات المتوقعة منه.

التوصية: المسح الروتيني للأمراض النفسية في الأطفال مرضي السكر والنوع الأول ضروري

الكلمات الدالة: مرض السكر للأطفال، الاكتئاب، المشاكل النفسية.

Introduction:

Diabetes mellitus is a group of diseases characterized by high blood glucose concentrations resulting from defects in insulin secretion, insulin action or both⁽¹⁾ The two main forms of diabetes are insulin-dependent diabetes mellitus (IDDM) or type (1) diabetes and noninsulin-dependent or type (2) diabetes.⁽²⁾ Diabetes mellitus type (1) is a form of diabetes mellitus that results from autoimmune destruction of insulin-producing beta cells of the pancreas⁽³⁾ Type (2) diabetes may account for 90% to 95% of all diagnosed cases of diabetes⁽¹⁾

Type 1 DM is typically diagnosed in childhood, adolescence, or early adulthood. Although the onset of type 1 DM often occurs early in life, 50% of patients with new-onset type 1 DM are older than 20 years of age. It usually starts in children aged 4 years or older, fairly abruptly, with the peak incidence of onset at age (11-13) years, coinciding with early adolescence and puberty⁽⁴⁾ Environmental factors can influence expression of type (1). A study showed that for identical twins, when one twin had type 1 diabetes, the other twin only had type 1 30% - 50% of the time. Despite having exactly the same genome, one twin had the disease, where the other did not; this suggests that environmental factors, in addition to genetic factors, can influence disease prevalence⁽⁵⁾

Symptoms at the time of the first clinical presentation can usually be traced back several days to several weeks; however, beta cell destruction may have started months, or even years, before the onset of clinical symptoms. Symptoms of type 1 DM include polyuria and thirst, polyphagia with weight loss, fatigue and weakness, muscle cramps, nocturnal enuresis, blurred vision,

gastrointestinal (GI) symptoms as Nausea, abdominal discomfort or pain, and change in bowel movements and patients may maintain their normal weight or exhibit wasting⁽⁶⁾

As a chronic disease, type 1 DM brings patients up against complicated psychological challenges, as changes induced by the onset of type (1) DM may be detected at the biological as well as emotional level⁽⁷⁾ The course of the disease is considered psychosomatic, as it affects and is affected by the patient's psychological functioning, social relationships and activities, professional life and family relations and functioning. There is evidence that life events play an important role in metabolic control in insulin-dependent DM patients⁽⁸⁾ There are several negative emotions that emerge in a chronic patient such as isolation, dependence and emotional difficulties including anger, denial, hopelessness, or depression⁽⁹⁾

Guidelines recommend that psychological screening should generally be a routine part of diabetes management⁽¹⁰⁾ A psychologist or psychiatrist should be considered part of the multidisciplinary team wherever possible⁽¹¹⁾ Depression, anxiety disorders, dementia, schizophrenia, and bipolar disorder (BD) occur more commonly in DM patients. DM may be involved in the development of the first three conditions. The exact mechanism by which DM may be linked to these conditions is not fully understood⁽¹²⁾

There appears to be a bidirectional relationship between DM and depression. About 7% of DM cases are thought to be attributed to depression⁽¹³⁾, as Depression is associated with a 60% to 65% increased risk of DM⁽¹⁴⁾ The nature of depression in diabetes is complex; adverse life events, severity of the medical illness, genetic and personality factors, and psychiatric history are all likely contributors to its occurrence⁽¹⁵⁾

The prevalence of psychiatric disorders other than depression in diabetes has not been extensively studied. There is evidence that anxiety disorders are significantly more common in this group, particularly generalized anxiety disorder and simple phobia⁽¹⁶⁾ Some studies suggest that lifetime- and recent prevalence rates of anxiety disorders may be just as or more common than depressive disorders among individuals with DM⁽¹⁷⁾ In the study by Peyrot & Rubin⁽¹⁷⁾, their findings suggest that individuals with diabetes may suffer from high anxiety levels as frequently as they do depression.

The mental health needs of young children often remain⁽¹⁸⁾ Given that routine mental health screening and intervention therapies are yet to be undertaken in diabetes clinics, this question cannot be fully answered. Two salient points should be noted, however. First, self-administered questionnaire tools are relatively inexpensive, and second, they can and should be used sequentially with other clinical tools/interviews⁽¹⁹⁾

Subjects And Methods;

The present study was carried out at the outpatient clinic in National Institute of Diabetes Cairo- Egypt where we examined 400 patients of which only 124 diabetic children fulfilled the inclusion criteria. The patient's parents signed written consent. The study lasted for one year, from March 2011 till 28 Feb. 2012. Every week, research candidate attended the clinic 2 days per week and recruited children to the study regarding the inclusion and exclusion criteria. Females represented 45.5% (56) of the study group while males represented 54.8% (68) of the study group. After consent of the caregiver, All children were subjected to: Full medical history with particular emphasis on: Age, sex, Age of onset of diabetes, Duration of diabetes and Diabetes complications if present. All children subjected to psychological screening using Mini International Neuropsychiatric Interview- Kid (MINI-KID): a structured interview for psychiatric evaluation and outcome-tracking in clinical psychopharmacology trials and epidemiological studies.

Statistical Analysis:

Data were collected, revised, verified then edited on P. C, All the statistical analyses were performed by Statistical Package for social, scientific science study (SPSS version 16). The results of quantitative data are expressed as the mean and standard deviation (mean \pm SD). The results of qualitative data are expressed as number and percentage. Unpaired t- test was used to compare a quantitative variable between two independent groups in parametric data. Paired t- test was used to compare a quantitative variable between two dependent groups in parametric data. Pearson correlation coefficient (r) was used to correlate between many variable groups. Levels of statistical significance were set as: $P > 0.05$: considered as non significant. $P < 0.05$: considered as significant. $P < .01$: considered as highly significant.

Results:

As regard mood disorders, 4 (3.2%) children had major depressive disorder, 8 (6.5%) children had Dysthymia, 4 (3.2%) experiences suicidal attempts and no one had symptoms suggestive of hypomania. As regard anxiety disorders, 4 (3.2%) children were affected, agoraphobia 8 (6.5%) children were affected, separation anxiety 4 (3.2%) were affected and adjustment disorders 8 (6.5%) were affected. Regarding obsessive compulsive disorder post traumatic disorder or generalized anxiety disorder no one had suggestive symptoms. Regarding eating disorders, 12 (9.68%) children suffered from symptoms suggestive of anorexia while no child had symptoms suggestive of bulimia. (Table 1)

Table (1) psychiatric manifestations of the study group

		N	(%)
Major Depression	Yes	4	3.2%
	No	120	96.8%
Suicide	Yes	4	3.2%
	No	120	96.8%
Dysthymia	Yes	8	6.5%
	No	116	93.5%
Panic	Yes	4	3.2%
	No	120	96.8%
Agoraphobia	Yes	8	6.5%
	No	116	93.5%
Separation Anxiety	Yes	4	3.2%
	No	120	96.8%
Social Phobia	Yes	4	3.2%
	No	120	96.8%
Adjustment	Yes	8	6.5%
	No	116	93.5%
Conduct Disorder	Yes	4	3.2%
	No	120	96.8%
Anorexia	Yes	12	9.68%
	No	112	90.32%

Table (2) shows a significant p value= 0.004 regarding dysthymia where male mean=0.00 and females mean= 0.142. Highly significant p value regarding school attendance= 0.00 where males mean=0.235 and females mean=0.00.

Table (2) Comparison between males and females regarding MINI- Kid total and sub- scores

	Sex	N	Mean	SD	P Value
Total Score	Males	68	0.29	0.45	
	Females	56	0.57	0.91	
MD	Males	68	0.00	0.00	
	Females	56	0.0714	0.25	
Suicide	Males	68	0.00	0.00	
	Females	56	0.0714	0.25	
Dysthima	Males	68	0.00	0.00	0.004*
	Females	56	0.142	0.35	
Panic	Males	68	0.00	0.00	0.044
	Females	56	0.714	0.25	
Agarophobia	Males	68	0.00	0.00	
	Females	56	0.142	0.35	
Sep Anxiety	Males	68	0.00	0.00	
	Females	56	0.0714	0.25	
Social. Phobia	Males	68	0.00	0.00 -	
	Females	56	0.0714	0.25	
CD	Males	68	0.0588	0.23	0.044
	Females	56	0.00	0.00	
Anorexia	Males	68	0.00	0.00	0.000**
	Females	56	0.342	0.227	
Adjustement	Males	68	0.00	0.00	
	Females	56	0.142	0.35	
School Attendance	Males	68	0.235	0.42	
	Females	56	0.00	0.00	

*: Significant, **: Highly Significant

In our study, statistically highly significant difference between males and females regarding age (p= 0.0001) and illness duration, otherwise no statistical difference was found regarding fasting blood sugar, glycated Hb, postprandial and diabetes complications. Also, highly significant higher prevalence of dysthymia, agarophobia, anorexia and adjustment disorders were found in females, while school attendance problems was highly significant higher in males. Table (3)

A highly significant positive correlation between illness duration and age and a highly significant negative correlation with total MINI Kid score were detected. Also, MINI Kid total score was highly significant positively correlated with FBS, PPS, illness duration and school attendance. table (3)

Table (3) Correlation between total MINI Kid score and descriptive data of the study group

HbA1C	Pearson Correlation (R)	Sig. (2- Tailed) (P)
Age	0.110	0.223
FBS	0.380	0.000**
PPS	0.254	0.004**
DM Complications	-0.108	0.223
Illness Duration	-0.247	0.006**
School Attendance	0.316	0.000**

*: Significant, **: Highly Significant

Discussion:

Type (1) diabetes mellitus (T1D) is a chronic condition with a rising incidence worldwide in developed as well as in developing countries⁽¹⁰⁾ Being both a chronic and a progressive disease, diabetes is a challenge for children, adolescents and their parents as they need special support to keep it under control.⁽²⁰⁾ The rate of depression among individuals diagnosed with DM is estimated to be two to four times the rate found in adults in the United States who are not diagnosed with DM/²¹¹ An estimated 8.3% of individuals with DM were also diagnosed with major depression and 31% with clinically relevant depression⁽²²⁾

Mood disorders such as major depressive disorder and dysthymia are the most frequently reported diagnoses in youth with type 1 diabetes, with a cumulative probability of 27.5% by the 10th year of type 1 diabetes duration⁽²³⁾ In cross-sectional studies, depression was observed in 10-26% of study samples using both self⁽²⁴⁾ and/or parent-report⁽²⁵⁾

It is important to note that depression may be under-diagnosed in children with diabetes because of the overlap of symptoms such as fatigue, weight loss, and impaired memory, which are common in both mood disorder and poor metabolic control⁽²⁶⁾ In addition, fluctuations in blood glucose levels such as hypoglycemic episodes and chronic hyperglycemia may directly contribute to alterations in behavior and mood,⁽²⁷⁾ which, while transient, may be distressing for both child and family. The presence of undiagnosed anxiety and depression among persons with this condition is a cause of concern since these symptoms hinder the initiation of treatment and allow frustration to build up in patients, thereby contributing to poor clinical outcomes.⁽²⁸⁾

The Mini International Neuropsychiatric Interview- Kid (MINI- Kid) is a structured interview for psychiatric evaluation and outcome-tracking in clinical psychopharmacology trials and epidemiological studies. It takes approximately 15 minutes to complete. Its sensitivity was substantial and specificity was excellent. Inter-rater and test-retest kappas of MINI- Kid were substantial to almost perfect for all the individual MINI- Kid disorders⁽²⁹⁾

The aim of the current study was to investigate the role of routine psychological screening in helping diabetic children to obtain better health related quality of life and better compliance. Many previous studies investigated the psychological screening of children and adolescents.

Other studies investigated psychological screening of diabetic children^(32,33) A; regard mood disorders, 4 (3.2%) children had MDD, 8 (6.5%) children had Dysthymia, 4 (3.2%) experienced suicidal attempts and no one had symptoms suggestive of hypomania.

Many studies emphasize the fact of positive correlation between endocrinological disorders and cognitive disorders.^(34,35) Concurrence of these two diseases is quite frequent, since depression in diabetic patients occurs more often than in the general population and worsens the prognosis of diabetic patients⁽³⁶⁾

Similar to results of the current study Chung et al.⁽³⁷⁾ found that children were identified as positive if they had any positive responses on the MINI- Kid interview. There were 24 children (3.6%) students diagnosed with major depressive disorder and 22 (3.3%) diagnosed with dysthymia. However, several reports in Mexico have shown that the prevalence of depression in diabetic patients can be 48.3% and 63% (38; 39). Frequently, a higher prevalence of depression has been reported in developed countries⁽²⁸⁾.

As regard anxiety disorders, 4 (3.2%) children were affected, agoraphobia 8 (6.5%) children were affected, separation anxiety 4 (3.2%) were affected and adjustment disorders 8 (6.5%) were affected. Regarding OCD, PTSD or Gad no one had symptoms suggestive. Among general population, anxiety exhibits a frequency of 14.3% (40). These frequencies are similar to the rates observed in study by Kessler et al.⁽⁴¹⁾ High rates of anxiety (9-19%) have been reported in type 1 diabetic samples.⁽³⁷⁾

Conclusion:

In conclusion, a key element in the proactive approach to diabetes management is complication screening. Mental health issues appear to be prognostic of maladaptive lifestyle practices, long-term problems with diabetes control, and earlier than expected onset of complications. Therefore mental health should be given equivalence to and perhaps precedence over, other complication screenings used in diabetes clinics. Routine screening for behavioral disturbances should begin in children at the time of diabetes diagnosis, with further assessment of parental mental health and family functioning for at risk children. Interventions can then be targeted based on the specific needs of individual children and families. In addition, physicians should be alert to the possibility of cognitive changes and learning difficulties in children with diabetes and request assessment early to minimize any negative effects on academic progress.

Recommendations:

Routine psychological screening in children with type 1 diabetes is recommended.

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