Screening for Psychological Impairment in children with Type I Diabetes

Prof.Samia Samy Aziz, Institute Of Postgraduate Childhood Studies
Prof.Hwayda Hosni Al-Gebaly, Institute Of Postgraduate Childhood Studies
Dr.Mohamed Hesham Elhefnawy, National Institute Of Diabetes
Reham Ahmed Shafik

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, itis usually complicated with psychological challenges, aschanges induced by the onset of type (1) DM may bedetected 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 124diabetic 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 Dysthimia, 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 فى الأطفال مرضى السكر

الخلفية: لقد لوحظ زيادة نسبة الأمراض النفسية فى الأطفال والمراهقين المصابين بالسكر كما هو الحال فى الأطفال ذوى الأمراض المزمنة الأخرى. ويتمثل رد الفعل النفسى الأول للسكر في: الحزن والقلق والأنسحاب والأعتمادية وحوالى ٣٠% من الأطفال يصابون بهذه الأعراض التى عادة ما تتحسن فى خلال السنة الاولى من الإصابة ولكن عدم وجود وسائل للتأقلم مع المرض خلال هذه الفترة يضع الأطفال فى خطر حدوث المزيد من المشاكل النفسية. ومن المشاكل النفسية الأخرى لمرضى السكر القلق من (٩- ١٩%). كما يتعرض المراهقين المصابين بالسكر وخاصة الفتيات لخطر أمراض اضطرابات الأكل بنسبة تصل إلى ١٠%. وأخيراً فإن نسبة المشاكل النفسية فى الأطفال مرضى السكر مرتفعة بالفعل، كما إن بعض الدراسات تؤكد أن المشاكل النفسية فى الطفولة من الممكن أن تستمر إلى مراحل عمرية متقدمة.

الغرض من الدراسة: التأكيد على أن هذه المشكلات النفسية لها تأثير قوى على التحكم فى مرض السكر نفسه وبالتالى المضاعفات المتوقعة من المرض.

المنهجية: وقد كانت الدراسة دراسة مقطعية ووصفية وتم استخدام إستمارة التاريخ المرضى والكشف الأكلينيكى على المريض وإختبار المينيكيد للمرضى وكان عدد المرضى الذين تم مناظرتهم (٤٠٠) مريض منهم (١٢٤) مريض تطابق مع شروط البحث. وتبين من الدراسة معاناة ٤ اطفال (٣,٣%) من اعراض الاكتئاب وأوضحت النتائج وجود اختلافات ذات دلالة إحصائية عالية بين الذكور والإناث فيما يتعلق بالعمر (P= 0.000) ومدة المرض كما وجد انهلا توجد فروق إحصائية فيما يتعلق بنسبة السكر فى الدم للصائم وبعد ساعتين من الافطار، ونسبة الهيمجلوبين السكرى، والمضاعفات.

النتائج: تبابنت من الدراسة معاناة ٤ أطفال (٣,٣%) من أعراض الإكتئاب، 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 فى الدم للصائم وبعد ساعتين من الإفطار، ونسبة الهيموجلين السكري، والمضاعفات.

الخلاصة: المشاكل النفسية فى الاطفال مرضى السكر متعددة ومن الممكن ان تستمر الى مراحل عمرية متقدمة كما ان لهاى تأثير قوى على التحكم فى مرض السكر نفسه والمضاعفات المتوقعة منه.

التوصية: المسح الروتينى للأمراض النفسية فى الأطفال مرضى السكر النوع الأول ضروري.

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

Introduction:

Diabetes mellitus is a group of diseases characterized by high blood glucose concentrations resulting fromdefects 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 upagainst complicated psychological challenges, aschanges induced by the onset of type (1) DM may bedetected at the biological as well as emotional level.[7] The course of the disease is consideredpsychosomatic, as it affects and is affected by thepatient's psychological functioning, social relationshipsand activities, professional life and familyrelations and functioning. There is evidence thatlife events play an important role in metabolic controlin insulin- dependent DM patients.[8] There are several negative emotions that emerge in achronic patient such as isolation, dependence andemotional 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 iscomplex; adverse life events, severity of the medicalillness, genetic and personality factors, and psychiatrichistory are all likely contributors to its occurrence.[15]

The prevalence of psychiatric disorders other thandepression in diabetes has not been extensively studied. There is evidence that anxiety disorders are significantlymore common in this group, particularlygeneralized 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 individualswith 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 screeningand intervention therapies are yet tobe undertaken in diabetes clinics, thisquestion cannot be fully answered. Twosalient points should be noted, however. First, self administered questionnairetools are relatively inexpensive, and second,they can and, should beused sequentially with other clinicaltools/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 ± 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 Dysthimia, 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 possessive 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%
Dysthimia	Yes	8	6.5%
	No	116	93.5%
Panic	Yes	4	3.2%
	No	120	96.8%
Agarophobia	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 dysthimia 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	0.042
	Females	56	0.57	0.91	
MD	Males	68	0.00	0.00	0.044
	Females	56	0.0714	0.25	
Suicide	Males	68	0.00	0.00	0.044
	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	0.004*
	Females	56	0.142	0.35	
Sep Anxiety	Males	68	0.00	0.00	0.044
	Females	56	0.0714	0.25	
Social. Phobia	Males	68	0.00	0.00	0.045
	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	0.004*
	Females	56	0.142	0.35	
School Attendance	Males	68	0.235	0.42	0.000**
	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 dysthimia, 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 conditionwith a rising incidence worldwide in developed as wellas in developing countries.[10] Being both a chronic and a progressive disease, diabetesis a challenge for children, adolescents and theirparents as they need special support to keep it undercontrol.[20] The rate of depression among individuals diagnosed with DM is estimated to betwo to four times the rate found in adults in the United States who are not diagnosedwith DM.[21] Anestimated 8.3% of individuals with DM were also diagnosed with major depression and31% with clinically relevant depression.[22]

Mood disorders such as major depressivedisorder and dysthymia are themost frequently reported diagnoses inyouth with type 1 diabetes, with a cumulativeprobability of 27.5% by the 10thyear of type 1 diabetes duration.[23] Incross- sectional studies, depression wasobserved in 10-26% of study samples usingboth self[24] and/or parent- report.[25]

It is important to note that depression may be under- diagnosedin children with diabetesbecause of the overlap of symptoms suchas fatigue, weight loss, and impairedmemory, which are common in bothmood disorder and poor metabolic control.[26] In addition, fluctuations inblood glucose levels such as hypoglycemicepisodes and chronic hyperglycemiamay directly contribute to alterations inbehavior and mood,[27] which, whiletransient, may be distressing for bothchild 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 allows 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 evaluationand outcome- tracking in clinical psychopharmacologytrials and epidemiological studies. It takes approximately15 minutes to complete. Its sensitivity was substantial andspecificity was excellent. Inter- rater and test- retest kappas ofMINI- Kid were substantial to almost perfect for all the individualMINI- 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.[29; 30; 31] Other studies investigated psychological screening of diabetic children.[32; 33]As regard mood disorders, 4 (3.2%) children had MDD, 8 (6.5%) children had Dythimia, 4 (3.2%) experiences 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 anypositive responses on the MINI- Kid interview. There were24 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).F requently, a higher prevalence of depression has been reported in developed countries[28].

As regard anxiety disorders, 4 (3.2%) children were affected, agarophobia 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 approachto diabetes management is complicationsscreening. Mental health issues appearto be prognostic of maladaptive lifestylepractices, long- term problems with diabetescontrol, and earlier than expectedonset of complications. Therefore mental healthshould be given equivalence to and perhapsprecedence over, other complication screenings used in diabetes clinics. Routinescreening for behavioral disturbanceshould begin in children at the time ofdiabetes diagnosis, with further assessmentof parental mental health and family functioning for at risk children. Interventionscan then be targeted based on thespecific needs of individual children andfamilies. In addition, physicians shouldbe alert to the possibility of cognitivechanges and learning difficulties in childrenwith diabetes and request assessmentearly to minimize any negativeeffects on academic progress.

Recommendations:

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

References:

1. Ng, S. W; Zaghlool, S; Ali, H. I; Harrison, G; Popkin, B. M. (2011): The prevalence and trends of overweight, obesity and nutrition- related non-communicable disease in the Arab Gulf states. **Obes. Rev.** 2011, 12, 1-13.
2. Galal, O (2003): The nutrition transition in Egypt: Obesity, undernutrition and the food consumption context. **Public Health Nutr**. 2002, 5, 141-148.
3. Cooke DW, Plotnick L (2008): "Type 1 diabetes mellitus in pediatrics". Pediatr Rev29 (11): 374-84; **Quiz** 385.
4. Centers for Disease Control and Prevention, (2011): **National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States**, 2011. Available at http://www.cdc.gov /diabetes/pubs/pdf/ndfs_2011. pdf. Accessed January 28, 2011.
5. Bluestone, J. A; Herold, K; Eisenbarth, G. (2010): "Genetics, pathogenesis and clinical interventions in type1 diabetes". **Nature** 464 (7293): 1293.
6. Harjutsalo V, Forsblom C, Groop PH. (2011): Time trends in mortality in patients with type 1 diabetes: nationwide population based cohort study. **BMJ.** Sep 8 2011;343: d5364.
7. Tsamparli1 A, Siousioura D. Primary Application Of Conjunctive Group Therapy In Adult Type 1 Diabetes Mellitus Patients **DiabetologiaCroatica** 38- 3, 2009
8. Stenstrom U, Wikby A, Hornquist JO, Andersson PO. (1993): Recent life events, gender, and the control of diabetes mellitus. Gen Hosp **Psychiatry** 1993; 15: 82-88.
9. Clay **MA**. (1992): **Group therapy as a means of enhancing patient compliance with treatment regimens and improving self esteem among insulin dependent adult diabetics**. University of Manitoba.
10. American Diabetes Association (2012): Standards of medical care in diabetes- 2012. **Diabetes Care** 2012, 35: S11- S63.
11. Canadian Diabetes Association. (2008): Clinical practise guidelines for the prevention and management of diabetes in Canada. **Can J Diabetes** 2008; 32 (Suppl. 1): S1-201.
12. Myers KA, Edwards AL. (2010): Diabetic patients with psychiatric illness. **Curr Diabetes Rev**. 2010;6:222-227.
13. Lyketsos CG. (2010): Depression and diabetes: more on what the relationship might be. **Am J Psychiatry**. 2010;167:496-497.
14. Campayo A, de Jonge P, Roy JF, et al. (2010): Depressive disorder and incident diabetes mellitus: the effect of characteristics of depression. **Am J Psychiatry**. 2010;167:580-588.
15. Mayou R, Peveler R, Davies B, Mann J, Fairburn C (1991): Psychiatric morbidity in young adults with insulin- dependent diabetes mellitus. **J Psychol Med** 21:639-45, 1991
16. Weyerer S, Hewer W, Pfeifer- Kurda M, Dilling H (1989): Psychiatric disorders and diabetes—results from a community study. J Psychosom Res 33:633-40, 1989
17. Peyrot, M.,& Rubin, R. R. (1997): Levels and risks of depression and anxiety symptomatology among diabetic adults. **Diabetes Care**, 20, 585-590.
18. Jones L, Rrustemi A, Shahini M, Uka A (2012): Mental health services for war- affected children: Report of a survey in Kosovo**. Br J Psychiatry** 2012, 540-546.
19. Cameron FG, Northam EA, Ambler GR, Daneman D. (2007): Routine Psychological Screening in Youth With Type 1 Diabetes and Their Parents. **Diabetes Care**, Volume 30, Number 10, October 2007
20. Negrato CA, Dias JP, Teixeira MF, et al (2010): Temporal trends in incidence of type 1 diabetes between 1986 and 2006 in Brazil. **J Endocrinol Invest** 2010, 33:373-377.
21. Arehart- Treichel, J. (2010): Depression risk increases in patients with diabetes. **American Psychiatric Association**, 45 (2), 8.
22. Li, C., Ford, E. S., Strine, T. W.,& Mokdad, A. H. (2007): Prevalence of depression among U. S. adults with diabetes: Findings from the 2006 behavioral risk factor surveillance system. **Diabetes Care** online
23. Kovacs M, Goldston D, Obrosky DS, Bonar LK (1997): Psychiatric disorders in youths with IDDM: rates and risk factors. **Diabetes Care** 20:36**-** 44, 1997