Contents lists available at ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

Brief report

The relationship between generic and diabetes specific psychological factors and glycaemic control in adults with type 1 diabetes

C. Shaban [a], J.A. Fosbury [b], D.A. Cavan [a], D. Kerr [a], T.C. Skinner [c,*]

[a] Bournemouth Diabetes and Endocrine Centre, Royal Bournemouth Hospital, Bournemouth, UK
[b] Diabetes and Endocrine Centre Guy's and St. Thomas' NHS Foundation Trust, St Thomas' Hospital, London, UK
[c] Combined Universities Centre for Rural Health, University of Western Australia, PO Box 109, Geraldton, WA 6531, Australia

ARTICLE INFO

Article history:
Received 9 April 2009
Received in revised form
9 April 2009
Accepted 7 May 2009
Published on line 4 June 2009

Keywords:
Depression
Anxiety
HbA1c
Diabetes distress
Type 1 diabetes

ABSTRACT

259 adults with type 1 diabetes completed measure of anxiety, depression and diabetes specific distress, HbA1c from medical records. Anxiety not depression predicted HbA1c, this association was mediated by illness specific cognitions. Targeting illness specific cognitions may be more productive than treatment of general dysphoria in type 1 diabetes.

1. Introduction

The literature indicates that depression and anxiety are more common in diabetes patients than in the general population [1] and are associated with poor glycaemic control [2]. However, anxiety and depression frequently coexist, and it is not clear which is more closely related to glycaemia. Further, as diabetes engenders a range of problematic diabetes specific emotions and cognitions [3], it is unclear how these more specific issues are related to more generic psychological problems. Therefore, this study sought to determine whether anxiety or depression is more closely related to HbA1c in type 1 diabetes, and whether the relationship is mediated by illness specific cognitions.

2. Methods

Consecutive patients with type 1 diabetes aged 16–60, duration >1 year, using a flexible dosage adjustment regimen, were recruited from clinic lists. Prior to their clinic appointment patients received a letter describing the study and were asked to complete self-report questionnaires the Hospital Anxiety and Depression Scale (HADS) the Diabetes Health Profile (DHP) and a demographic questionnaire while they waited to see the doctor.

The HADS is a well-validated questionnaire, used widely with medical populations, for research and clinical practice [4]. It is divided into 2 subscales to assess symptoms of anxiety

* *Corresponding author*. Tel.: +61 8 9956 0200/61 417 012942 (mobile); fax: +61 8 9964 2096.
E-mail address: timskinner@cucrh.uwa.edu.au (T.C. Skinner).
0168-8227/$ – see front matter
doi:10.1016/j.diabres.2009.05.006

and depression separately. The Diabetes Health Profile (DHP) was designed for use with people in the UK with type 1 diabetes and asks about the feelings and effect that diabetes may have on the patient's life [5]. Three subscales measure diabetes specific psychological distress, barriers to activity and disinhibited eating. HbA1c (DCCT aligned) was used as the measure of metabolic control and recorded up to 1 month prior to the clinic visit on the clinic database.

2.1. *Analysis*

All analysis was undertaken using SPSS v14. Between group comparisons were undertaken using independent *t*-test (two groups) or ANOVA for two or more groups. As HbA1c was normally distributed (Kolmogorov–Smirnov $Z = 1.07$; $p > 0.2$) but psychological measures were not, the Kendalls Tau correlations coefficient is given for correlations with HbA1c, and Spearman's rho for all other correlations. Multiple regression were undertaken, with HbA1c as the dependent variable, and psychological variables entered as predictors after controlling for the effect of gender, age, duration of diabetes, and marital status, all common predictors of HbA1c.

To determine whether anxiety and/or depression were predictive of HbA1c, a multiple regression analysis was undertaken. After controlling for demographic and medical characteristics anxiety but not depression was predictive of HbA1c, see Table 2 (Block 2, Regression 1). To test whether diabetes specific emotional distress mediates the relationship between depression/anxiety and metabolic control, Baron Kenny's criteria for a mediation effect was tested [6]. With HbA1c as the dependent variable diabetes specific measures were entered after controlling for demographic and medical characteristics (see Regression 2, Table 2). This analysis indicated that diabetes specific psychological distress was a significant predictor of HbA1c. As anxiety was correlated with diabetes specific psychological distress ($r = 0.69$; $p < 0.001$) mediation analysis was undertaken. Therefore, age, duration and smoking status and anxiety were entered in Block 1. Thereafter, diabetes specific psychological distress was entered in Block 2. Entering diabetes psychological distress into the model resulted in anxiety no longer being predictive of HbA1c (see Regression 3, Table 2), thereby demonstrating that diabetes specific distress mediated the effect of anxiety on HbA1c.

3. Results

Of 399 patients who attended, 26% declined to participate, 3% were missed in clinic, 6% did not meet the inclusion criteria and one questionnaire was incomplete, resulting in 259 participants. Females consume less alcohol, were more anxious (HADS), and report more problematic issues relating to eating than males (Table 1). Married/cohabiting individuals reported less diabetes distress ($p < 0.005$), fewer barriers ($p < 0.05$), are older ($p < 0.001$) and had longer duration of diabetes ($p < 0.001$). HbA1c was correlated with anxiety ($r = 0.14$; $p < 0.001$), depression ($r = 0.10$; $p < 0.05$), diabetes specific distress ($r = 0.18$; $p < 0.001$) and disinhibited eating ($r = 0.12$; $p < 0.001$).

4. Discussion

The results of this study indicate it is anxiety and not depression that is associated with metabolic control. Furthermore the association between anxiety and HbA1c is mediated by diabetes specific psychological distress. Thus the emotions and cognitions associated with diabetes may lead to maladaptive behaviours that result in sub-optimal control. The experience of anxiety is likely to be linked both to the cognitions initiated by the awareness of the adverse long-term health consequences of sub optimal metabolic control and the experience of hypoglycaemic episodes. High levels of diabetes specific emotional problems have been reported in patients with high levels of symptoms of depression [3].

Table 1 – Demographic, medical and psychological characteristics of the sample.

	Gender			
	Female, $n = 118$		Male, $n = 141$	
	Mean	Std. Deviation	Mean	Std. Deviation
Age	37.97	11.3	39.96	11.4
Duration	18.050	11.0	18.29	12.2
Married	54%		48%	
Smoker	24%		31%	
Treatment				
HBA1C	8.91	1.6	8.69	1.3
Alcohol	4.92***	5.9	9.45	13.2
Anxiety	7.58***	4.8	5.50	4.1
Depression	3.72	3.6	3.31	3.5
Diabetes psychological distress	8.83	5.9	7.73	6.1
Barriers to activity	9.64	7.1	8.68	5.8
Eating	5.52***	3.4	3.60	2.9

*** $p < 0.001$.