

Emotional difficulties in diabetes mellitus

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SUMMARY Sixty children and adolescents with diabetes aged between 9 and 18 years were investigated for emotional difficulties in association with their diabetic control. Seventeen (28%) had appreciable emotional or behavioural difficulties according to parental report, and seven (12%) considered themselves 'possibly depressed'. These latter patients had a mean glycosylated haemoglobin concentration below 10%, poorer self esteem, and a greater external locus of control. Three were considered not to have pronounced emotional difficulties according to parental report.

It is often said that children with difficulties in diabetic management may have difficulties in other areas of their lives. Furthermore, the published reports suggest that it is children with poor control who are likely to show signs of emotional and behavioural difficulties.^{1 2}

From the psychological point of view, children with chronic physical problems are known to have increased risk of psychiatric disorder, and in general the rates of emotional and behavioural difficulties in children attending hospital seem to be high.³

Parental reports have been a principal research method in eliciting signs of psychiatric disorder in children. Recent evidence indicates, however, that in some children self reports may be more important, particularly for establishing the presence of depression.⁴

A further issue of concern is how to define and measure diabetic control. It seemed reasonable to take a well established biochemical measure as a more objective indicator of diabetic control than relying on clinical reports that may be subject to a number of biases from clinicians and families alike.

In this study we set out to find out if there was an association between mean glycosylated haemoglobin and emotional and behavioural difficulties according to both parental reports and children's self reports. We hypothesised that an association would be found between poor control and an excess of emotional and behavioural difficulties according to both parent and child reports.

Method

The diabetic clinic of the Royal Manchester Chil-

dren's Hospital was used to obtain a sample of children aged between 9 and 18 years. All children were considered as suitable candidates for entry into the study, and the following inclusion criteria were used:

- (1) The child should be aged between 9 and 18 years.
- (2) He/she was of normal intelligence.
- (3) He/she had lived with a parent(s) or parent surrogate longer than the last 12 months.
- (4) He/she was free of any other serious concurrent medical illness at the time of the interview.

Sixty children met the criteria for inclusion into the study, and all agreed to participate.

Instruments used.

- (1) The Rutter Parental Screening Questionnaire. The Rutter A(2) Questionnaire was used to obtain information about emotional and behavioural difficulties from parents concerning the children. The instrument contains 31 items concerning the child's emotional and behavioural well being over the past 12 months. The cut off score of 13 was used as recommended—children scoring above 13 being recognised as having appreciable emotional and behavioural problems.⁵
- (2) The Birleson Depression Inventory. This is an 18 item questionnaire consisting of statements about a child's mood in the past two weeks. The 18 items are scored on a scale of 0–2, and a score of 13 or more is considered as likely to represent a psychiatric case of depression. For this study a conservative view was taken, and

children scoring 13 or above were considered to be possibly depressed.⁶

- (3) The Lipsitt Self-Esteem Scale. A child's perception of himself is considered to be an important factor influencing his behaviour and psychological adjustment. The Lipsitt Self-Esteem Scale is a 22 item rating scale designed to assess how children evaluate themselves. There is a score of 1 to 5 for each item, the higher the total score the greater the child's self esteem.⁷
- (4) Locus of control. The Nowicki-Strickland Children's Locus of Control Scale is a 40 item yes/no self report questionnaire designed to assess the extent to which a child has an internal or external locus of control. The individual with an internal locus of control believes that his actions give him some control over what happens to him. In contrast, the person with an external locus of control believes that his actions have little effect on his destiny and what happens to him is under the control of people or forces other than himself. In this study the total number of external responses made was calculated. Scores over 13 were considered to indicate an external locus of control.⁸
- (5) Mean glycosylated haemoglobin. Glycosylated haemoglobin was measured using a Boehringer mini column method with aldimine inhibition. The normal range of values for children (4-18 years) is 4.0-7.0%. All values measured from six months before to six months after psychological testing for each individual were averaged: two to six estimations with a medium value of three were available for each child.

All investigations were completed in the clinic. Most of the parental reports were completed by the mothers, with a small proportion (less than 10%) by the fathers, who in some cases were single parents. All information was obtained by one of two authors (AD and HC), who remained available for discussion and clarification for any of the questionnaires and who checked to ensure all items were understood and answered.

Results

Characteristics of the clinic sample. All of the sixty children and adolescents available for the study participated. There were 30 boys and 30 girls with an age range of 9.0 to 18.8 years (mean (SD) 14.1 (2.3)). Nineteen (32%) of the subjects were aged 12 or younger, 41 (68%) aged 13 or older. The duration of diabetes ranged from 0.1 to 15 years

(mean (SD) 5.6 (3.9)), age at diagnosis ranging from 0.8 to 12.5 years (mean (SD) 8.25 (4.0)).

Fifty three out of the 60 (88%) came from two parent families. The mean number of children per family was 2.6, and four cases were only children. Eight children came from a large family—that is, four or more children. On the basis of social class 20 (33%) of the families would be described as middle class and 40 (67%) as working class.

The presence of emotional and behavioural difficulties. On the Rutter Parental Screening Questionnaire 17 (28%) children and adolescents had appreciable emotional or behavioural difficulties.

On the Birleson Depression Inventory seven (12%) children and adolescents reported possible depression (mean (SD) score 16.57 (2.97)). The age range of these seven subjects was 10-18 years (mean (SD) 13.43 (2.23)). Three were under 12 and there were five girls and two boys. Five of these children had been diagnosed diabetic for at least five years, one for 18 months, and one for six months. Although a significant association exists between parent and self report ($\chi^2=5.93$, $df=1$, $p<0.02$), 11 children with appreciable difficulties on parental questionnaire did not consider themselves as possibly depressed, whereas three who did were not scored on parental questionnaire as suffering from appreciable emotional or behavioural difficulties.

There was a significant negative correlation between self esteem and being 'possibly depressed' ($\rho=-0.39$, $p<0.01$). Furthermore, all seven children with possible depression were more likely to have an external locus of control ($\chi^2=8.54$, $df=1$, $p<0.01$).

Relation of mood to family background factors. There was no significant relation of mood score with the following background factors: social class, unemployment, large family size, single parent families, or serious illness in any family member.

Table 1 Comparison between the degree of diabetic control (as measured by mean glycosylated haemoglobin concentrations) and the presence of psychiatric disorder in children attending the diabetic clinic (n=60)

	n=	Mean glycosylated haemoglobin	
		Good control (5-9.9%)	Poor control (10% or more)
Rutter score:			
Negative (≤ 13)	43	19 (44%)	24 (56%)
Positive (> 13)	17	11 (65%)	6 (35%)

$\chi^2=2.05$, $df=1$, NS.

Table 2 Comparison between the degree of diabetic control (as measured by the mean glycosylated haemoglobin concentrations) and the presence of depressive symptoms in children attending the diabetic clinic (n=60)

	n=	Mean glycosylated haemoglobin	
		Good control (5-9.9%)	Poor control (10% or more)
Birleson score:			
Negative (≤ 13)	53	23 (40%)	30 (60%)
Positive (> 13)	7	7 (100%)	0

$\chi^2=8.0$, $df=1$, $p<0.01$.

Mean glycosylated haemoglobin. The mean value for all 60 children was 10.1%. Thirty children had values of 10% or more and 30 children values below 10%. There was no statistical relation with age, duration of disease, age of diagnosis, or sex. All 10 children who reported possible depression had values below 10% ($\chi^2=8$, $df=1$, $p<0.01$). There was no significant relation of glycosylated haemoglobin with other psychological measures.

Discussion

During a previous study of continuous subcutaneous insulin infusion in children it was noted by parents that improvement in biochemical 'control' was associated with an improvement in mood.⁹ Others have commented on improved well being secondary to good diabetic control.^{10 11} These observations prompted this study of mood state in a larger group of diabetic children.

The findings suggest that for the age range studied there is a substantial degree of emotional and behavioural difficulties on parental or self report, or both. We did not use a comparison sample and are unable to comment on whether the rate of psychiatric disorder is any different from that of other children suffering from chronic illness. There is no doubt that the published reports indicate a high risk of psychiatric disorder for children with chronic medical illness and also for children attending hospital.^{1 12}

An unexpected finding was the association between a lower level of glycosylated haemoglobin (a crude index of overall glycaemic control) and possible depression. The initial presumption of the investigators was that such a group of diabetic children would have poor glycaemic control. Are the measurements used valid indices of glycaemic control and mood state? Glycosylated haemoglobin concentrations correlate well with other estimates of glycaemic control, including clinical and biochemical ratings in diabetic children,¹³ and their usefulness

has been consistently validated, provided due attention is paid to certain methodological difficulties.¹⁴ If the concentration falls into the normal non-diabetic range there may be a higher frequency of overt hypoglycaemia; only one patient, however, had a mean value in the normal range (appropriate for age). Lower concentrations of glycosylated haemoglobin were recently described in those with increased susceptibility to nocturnal hypoglycaemia.¹⁵ Subclinical hypoglycaemia may be present in those children with apparently good glycaemic control.

Three of the children with possible depression were younger than 12 years. Thus self reported mood disturbance is not merely a function of adolescence when an increased rate of reporting transient misery and sadness can occur.⁵ Furthermore, the mean score on the depression inventory suggests that for some cases symptoms may be severe. These findings emphasise the importance of talking to children about their progress and management as well as obtaining reports from parents.

Furthermore, the duration of diabetes in six cases was longer than 12 months, suggesting that the mood disturbance was not merely a coping or adjustment response about recently diagnosed illness.

The relation of the depression inventory scores with other psychological indices measured in this study shows a degree of internal consistency. There is a positive correlation with parental psychiatric report, a negative correlation with self esteem, and a greater degree of external locus of control in the seven individuals with possible depression. If these indices are considered valid why should there be such a relation?

Firstly, some children may have physiological or psychological characteristics, or both, that predispose them to feelings of depression as well as facilitate the achievement of good glycaemic control. Secondly, tighter glycaemic control might induce greater feelings of depression. Thirdly, the means of achieving good glycaemic control may increase feelings of depression. Fourthly, maintaining good glycaemic control may predispose some patients with diabetes to feelings of depression, perhaps for the following reasons:

- Loss of coping abilities. It may be that being a well controlled patient with diabetes is, in fact, much more hard work than being poorly controlled. Coping mechanisms are constantly being serviced as he/she has to work even harder to be normal than ordinary children.
- The lack of personal reward. Being well controlled results in a degree of external positive regard and reward by physicians,

parents, and perhaps others. Internal personal rewards, however, are less readily apparent. Good control is not associated with a sense of well being or greater social or personal opportunity.

- (c) The dependence on the clinic. Poorly controlled patients with diabetes are more likely to receive attention and enthusiasm from the diabetic clinic. When well controlled, less visits occur. Fluctuations in clinic attendance may influence the child's mood state.

Fifthly, the association between possible depression and glycaemic control may be mediated through other mental health factors, such as maternal depression or family difficulties. Further research should pay particular attention to the influence of such factors on the child's well being.

The underlying assumptions that getting your diabetes well controlled and looking after yourself physically will result in you feeling better is not necessarily true in all cases on the basis of these findings. Furthermore, these findings emphasise the need to discriminate between *glycaemic control* (the biochemical condition of the patient) and *diabetic adjustment* (the psychosocial condition of the patient). The latter concept is poorly researched, merits further attention, and has implications for the understanding of treatment compliance and management.

The size of the sample and the methods employed require some comment. Firstly, depressive symptoms do not imply depressive illness, and self report questionnaires are best used as indicators of those parents and children who should be interviewed directly to establish the severity of their difficulties.

Secondly, factors that may influence the relations between emotional or behavioural difficulties and diabetes must be carefully controlled for. This study considers only a few of these; in particular, characteristics of the child, the mental state of the parents, the family, and possibly school and social factors should be taken into account.

This research has suggested that there is a subgroup of diabetic children and adolescents who may have an increased potential for depression and are characterised by lower glycosylated haemo-

globin concentrations while on conventional treatment. In some cases achievement of tight glycaemic control by conventional (and unphysiological) treatment with insulin may be associated with a psychological penalty hitherto unrecognised.

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