

## Emotional, behavioural, and educational disorders in diabetic children

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**SUMMARY** This study assesses the emotional and educational status of a group of diabetic children and considers the interaction of these measurements with diabetic control. Information was collected on 76 diabetic children (43 boys and 33 girls) by means of interviews at their clinic and two questionnaires, including the Rutter B2 behavioural scale,<sup>1-2</sup> which were completed by their schools. This information was compared with estimates of diabetic control. The mean age of these children was 10.9 years and their mean duration of diabetes 3.5 years. Information was also obtained, by means of a questionnaire completed by teachers, on a group of nondiabetic children. Psychiatric disorder was not more common in the diabetic children than in the controls, but diabetic children were more backward at reading. 20 diabetic children were at least two years behind and 6 were between one and two years behind with reading. The figures for the nondiabetic children were 10 and 1 respectively. There was a correlation between poor diabetic control and the presence of psychiatric disorder, and backwardness in reading. In 39% of diabetic children there were adverse psychosocial factors in the family background. Poor diabetic control correlated with the presence of adverse psychosocial factors. In any serious attempt at achieving diabetic control in children, attention to insulin and diet must not be divorced from attention to the domestic, scholastic, and emotional problems of the child.

All parents have problems in maintaining a balanced attitude while bringing up their children, and the parents of diabetic children have a particularly difficult task as these children are often on a precarious metabolic tightrope. It is difficult for such parents to take the advice of Kanner<sup>3</sup> to steer a middle course between 'uninformed carelessness' and 'frantic over-solicitude'.

The control of diabetes is currently imprecise and this results in fluctuating levels of blood glucose. At the same time emotional stress produces metabolic changes in diabetic patients<sup>4-5</sup> and can intensify the problems of metabolic instability. Furthermore the whole family of a diabetic child is affected to some degree by the emotional consequences of the disease.<sup>6</sup> In practical terms, the disease can frustrate the child by depriving him of his normal activity, or it can set him apart from other children producing timid

withdrawal or overt aggression according to temperament. The parents' reactions to the child influence their management which directly affects the child's activities and the stigma he feels.<sup>7</sup>

An American study of 50 diabetic children and controls,<sup>8</sup> found that similar proportions of the two groups were considered to have a good adjustment at school but that only 24% of diabetic children had a good adjustment at home, compared with 62% of controls. The results of a Swedish study<sup>9</sup> showed that the number of diabetic children judged to have psychiatric disorders was similar to that found among control children, although the diabetic children had a greater number of symptoms. However, the most striking finding in the Swedish study was the high incidence of psychiatric problems among the parents. A Scottish study<sup>10</sup> later confirmed Sterky's results<sup>9</sup> finding that there was no excess of psychiatric disorder among diabetic primary school-children but that the mothers of diabetic children were more depressed and anxious than mothers of control children.

The present study was undertaken to measure the emotional, behavioural, and learning problems in a

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group of diabetic children attending one clinic with a uniform policy on diabetic management, and to assess how these findings related to levels of diabetic control.

### Methods

Data on the family background and the child's emotional and behavioural state were collected for 76 diabetic children. Each child attended the same clinic at 3-monthly intervals and saw the same paediatrician at each visit. Their ages ranged from 5 to 16 years. The parents were interviewed routinely by the child psychiatrist after the child had seen the paediatrician.

With the permission of the parents, each school was asked to complete a questionnaire about the child's attitude and attainments at school. Additionally the school also completed the Rutter B2 behavioural scale for teachers; this assesses behaviour at school and contains 26 items, each one having a 3-point scale. This scale has been widely used to screen schoolchildren.<sup>1-2</sup> The school was asked to complete both types of questionnaire for an anonymous control child who was the 'next child of the same sex in the same class list going down'.

Clinical assessment of diabetic control was made by the paediatrician at each visit from the daily records of urine analysis, symptoms of hypoglycaemia and hyperglycaemia, and the record of the child's growth. The paediatrician assessed control as good (3), average or reasonable (2), or poor (1) at each visit, and the mean score for the period during which behavioural assessments were made (generally one year) was taken.

Evidence for profound hypoglycaemic episodes was sought by studying the notes of the child to determine whether there had been one admission, or more, from the time of diagnosis of diabetes, and whether such admission was associated with convulsions.

Psychiatric disorder was taken to mean 'an abnormality of behaviour, emotions or relationships sufficiently marked and sufficiently prolonged to cause handicap to the child himself and/or distress or disturbance in the family or community'.<sup>2</sup> The duration of the disorder thus excludes transient psychiatric symptoms during the period of adjustment after the diagnosis of diabetes.

### Results

Data were collected on 76 diabetic children (43 boys and 33 girls). Their mean age was 10.9 (SD 2.8, range 5-16) years. The mean age at the onset of

diabetes was 7.5 (SD 3.5, range 1-14) years. 38% had a family history of diabetes. In 11 (14%) cases a first-degree relative had the disease and in this group were two pairs of brothers attending the clinic.

**Family background.** Significant psychosocial factors in the family background were present in 30 (39%) of the 76 children (Table 1). The factors were classified according to axis V of the multiaxial classification from the World Health Organisation's *International Classification of Disease* 9th version.<sup>11</sup> No similar data were available for the control children who remained anonymous to the investigators.

**Psychiatric disorder recognised at the clinic.** Five girls and 9 boys were recognised as having psychiatric disorders at the diabetic clinic. With the exception of one, all the parents were aware of a problem which needed help. The exception was a somewhat hostile mother who denied that her obviously unhappy, withdrawn daughter had more problems than other girls have. The types of psychiatric disorder recognised are shown in Table 2. One boy and one girl who had temporary symptoms lasting only a few weeks after the onset of diabetes were not included, as these symptoms were regarded as transient adjustments.

**Behavioural deviancy at school.** Schools completed the Rutter B2 forms on 70 (30 girls and 40 boys) of the 76 diabetic children. Forms were not returned for 3 girls and 3 boys. Seven (23%) girls were rated as

Table 1 *Psychosocial factors in the families of 76 diabetic children*

Psychosocial factor	ICD 9 code	Children	
		No.	%
Mental disturbance in family member	01	2	3
Discordant family relationships	02	9	12
Lack of warmth	03	1	1
Parental over-involvement	04	5	5
Inadequate or inconsistent care	05	1	1
Single parent family	09	7	9
Immigration/social transplant	11	1	1
Other intrafamilial stress	13	4	5

Table 2 *Psychiatric disorders recognised at the clinic in 76 diabetic children*

Type of disorder	Boys (n=43)	Girls (n=33)
Neurotic*	3	3
Conduct†	4	1
Mixed neurotic and conduct	2	1

\*Predominantly overt misery, fears, and anxiety.

†Predominantly disobedience, stealing, and aggression.

deviant by the teachers with a score of at least 9 on the B2 scales. Six of these girls had predominantly neurotic symptoms. Seven (17.5%) boys were rated as deviant by the teachers with B2 scores of at least 9. Three of these had predominantly neurotic symptoms, 3 had predominant disorders of conduct, and one was mixed. Slightly fewer of the control children were deviant (Table 3). This difference is not statistically significant ( $\chi^2$  test,  $P > 0.05$ ).

**Psychiatric disorders identified by the parents at the clinic and by teachers.** 14 children with psychiatric disorders were identified in the clinic by interviewing the parents. The B2 questionnaires also identified 14 children whose behaviour or emotional state was rated as deviant at school. Eight children (3 girls and 5 boys) were common to both groups, so that 20 children with emotional or behavioural disturbances were found in the sample of 76 children (Table 4). All the 8 children identified by teachers at school and parents at the clinic had a combination of psychiatric, social, and educational problems, and their disturbances were predominantly those of conduct—disobedience, truancy, stealing, and aggression. Neurotic symptoms of fearfulness, anxiety, and misery were a prominent feature of the 6 children identified only at the clinic.

**Backwardness in reading.** Data on reading attainment were available on the 70 children for whom schools completed both questionnaires. 20 (28.5%) of the diabetic children and 10 (19%) of the controls were at least 2 years behind chronological age in reading. Six (8.5%) of the diabetic children and one (1.5%) control child were slightly retarded in reading, being at least one year but less than 2 years behind chronological age in reading (Table 5). More of the diabetic boys (13) than girls (6) were seriously

retarded in reading but the difference was not significant. It must be stressed that no measures of intelligence were used and the problem was one of general reading backwardness rather than specific reading retardation.

**Duration of illness.** 18% of the children had had diabetes for at least 6 years, 57% had had diabetes for between 2 and 6 years, and 25% had developed diabetes within 2 years of assessment. There was no relationship between duration of illness and psychiatric disorder or reading problem in the group as a whole, or in boys or girls considered separately.

**Family history.** Psychiatric disorders were not more commonly found than reading problems in the 11 (14%) children who had a first-degree relative with diabetes, nor were they more common in the 18 (24%) with a family history of diabetes affecting a more distant relative.

**Associations with diabetic control.** Adverse psychosocial factors in the family background were found to be associated with less good control of diabetes as judged by the paediatrician at the clinic (Table 6).

Psychiatric problems were more common in children whose diabetes was poorly controlled (Table 7). An association was also found between backwardness in reading and poor diabetic control (Table 8).

Backwardness in reading was not more common in

Table 3 Behavioural deviancy recognised at school\*

	Diabetic (n=70)	Controls (n=70)
Boys	7	3
Girls	7	6

\*Number of children with deviant scores according to Rutter's B2 behavioural scale.

Table 4 Psychiatric disturbance detected at school (questionnaire) and at clinic (parent interview)

Source of identification	Girls (n=33)	Boys (n=43)
School only	4	2
Clinic only	2	4
School and clinic	3	5

Table 5 Backwardness in reading reported by schools for 70 diabetic children and 70 controls

	Backward in reading		
	Retarded by at least 2 years	Retarded by 1-2 years	Not retarded
Diabetics (n=70)	20	6	44
Controls (n=70)	10	1	59

$\chi^2 = 9.089$ ,  $df = 2$ .  
 $P < 0.02$ .

Table 6 Adverse psychosocial factors and clinical assessment of diabetic control in 76 diabetic children

	Clinical assessment of diabetic control		
	Poor*	Fair†	Good‡
Adverse psychosocial factors in family background	12	17	1
No major psychosocial problems	8	25	13

$\chi^2 = 9.597$ ,  $df = 2$ .  
 $P < 0.01$ .

\*Mean score  $< 2.0$ , †mean score  $2.0-2.49$ , ‡mean score  $2.5$  or more.

children known to have had serious episodes of hypoglycaemia leading to hospital admission with or without convulsions (Table 9).

10 children had psychiatric disorders, were seriously backward in reading, and had adverse psychosocial factors in the family background. These disadvantages did not appear to be cumulative in their effect since poor control was related to any of the three, and was not more common in children with two or all three (Table 10). The numbers are not large enough to allow clear distinction between the three handicaps. However, the influence of psychosocial factors on reading problems is evident only when the diabetes is well controlled (Table 11). Half the children with poorly controlled diabetes were retarded in reading.

Table 7 *Behavioural and emotional problems in 76 diabetic children and clinical assessment of diabetic control*

	Clinical assessment of diabetic control		
	Poor	Fair	Good
Problems at school or home	9	11	0
No psychiatric problems	11	31	14

$\chi^2 = 8.543$ ,  $df = 2$ .  
 $P < 0.02$ .

See footnote to Table 6 for scores.

Table 8 *Poor readers and clinical assessment of diabetic control in 70 diabetic children*

	Clinical assessment of diabetic control		
	Poor	Fair	Good
Poor readers (at least 2 years behind)	10	9	1
Not retarded/slightly retarded in reading	10	29	11

$\chi^2 = 7.3197$ ,  $df = 2$ .  
 $P < 0.02$ .

See footnote to Table 6 for scores.

Table 9 *Backwardness in reading and admissions for hypoglycaemia in 70 diabetic children*

	Retarded in reading	
	At least 28 months	Slightly retarded or not at all
Admission for hypoglycaemia and convulsions	2	4
Admission for hypoglycaemia (no convulsions)	2	3
No admission for hypoglycaemia	16	43

$\chi^2 = 0.5026$  NS.

Table 10 *Clinical assessment of diabetic control related to additional handicaps of psychiatric disorder, adverse psychosocial factors, and backwardness in reading occurring in isolation† or together\* in 76 diabetic children*

Diabetic control	3 handicaps*	2 handicaps*	Only 1 handicap*	None
Poor	5	4	7	4
Fair or good	5	5	15	31
Any of the 3 handicaps†				
Poor	16			
Fair or good	25			

\* $\chi^2 = 6.49$ ,  $df = 3$  NS

† $\chi^2 = 6.06$ ,  $df = 1$ .

$P < 0.02$ .

Table 11 *Diabetic children: backwardness in reading by at least 2 years*

Diabetic control	Retarded in reading		Not retarded in reading	
	No.	(%)	No.	(%)
*Fair or good (n = 56)				
With psychosocial problems (n = 18)	6	(33)	12	(67)
Without psychosocial problems (n = 38)	4	(10)	34	(90)
Poor (n = 20)				
With psychosocial problems (n = 12)	6	(50)	6	(50)
Without psychosocial problems (n = 8)	4	(50)	4	(50)

\* $\chi^2 = 7.407$ ,  $P < 0.02$ ,  $df = 2$ .

Psychiatric problems were more common in children from homes with psychosocial disadvantage in both the well controlled and poorly controlled children.

## Discussion

Diabetes in a child produces emotional stress both on the child and his family. Among the 76 diabetic children in the present study, in addition to the stress resulting from diabetes, more than one-third (39%) of the families were under stress from pre-existing adverse psychosocial circumstances. No psychosocial data were available from the control children in the school, but a study on 119 first-born children in the same area shows that 21% of such families have similar problems.

Teachers' reports showed that the diabetic children were not seen as having behavioural or emotional problems at school more often than other children in the class. The numbers rated as deviant by the teachers tallied with the numbers identified by interviewing parents at the clinic. Some children were regarded as deviant only at school, while others only at home, and a proportion in both places. This study, unlike others,<sup>8-9</sup> did not therefore suggest that diabetic children are more likely to have

behavioural or emotional disturbance than other children.

Nearly twice as many diabetic children as control children were seriously retarded in reading as reported by the schools. Since the children had not been tested for intelligence, no allowance could be made for this. Backwardness in reading seems unrelated to major hypoglycaemic attacks and children who had had one hospital admission or more because of hypoglycaemia (with or without associated convulsions) were no more likely to be severely retarded in reading than diabetic children who had never been admitted in hypoglycaemia. However, children whose diabetic control was assessed clinically as poor during the period of study were more likely to be poor readers.

Clinical assessment of diabetic control during the period that the school assessments were made was shown to be significantly related to the incidence of behavioural disorders, backwardness in reading, and to the presence of adverse psychosocial circumstances.

It is generally agreed that good diabetic control protects against the long-term microvascular complications of diabetes.<sup>12</sup> As it is recognised that emotional stress can directly affect metabolic stability in diabetic patients, any serious attempt at achieving diabetic control should also consider the social circumstances and emotional climate of the family as well as the insulin and dietary regimens.

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