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# Do the social conditions of diabetic children influence the course of the disease?

## Abstract

**Background and aims.** The aim of the study was to assess the influence of the social status of children with type 1 diabetes mellitus (DM1) on the course of the disease.

**Materials and methods.** 87 children drawn from throughout Poland (44 girls and 43 boys) aged  $13.4 \pm 3.1$  and all suffering from DM1 over  $4.2 \pm 3.0$  years and with good metabolic control ( $HbA_{1c}$   $7.4 \pm 1.6$ ) participated in the study. A questionnaire was completed during treatment at the Rehabilitation Centre in 2002.

**Results.** On the basis of the data, it was found that the duration of DM1 correlated significantly ( $p = 0.004$ ) with the age of the diabetic children. There was also a relationship between metabolic control (evaluated by  $HbA_{1c}$ ) and age ( $p = 0.006$ ). The educational level of the mother had no bearing on the pattern of insulin therapy ( $p = 0.62$  girls;  $p = 0.76$  boys) or the development of complications

( $p = 0.79$  girls;  $p = 0.46$  boys). Parental educational level ( $p = 0.63$  girls;  $p = 0.76$  boys) and child's domicile ( $p = 0.62$  girls;  $p = 0.12$  boys) had no significant influence on the pattern of insulin therapy. The missing of lessons at school in connection with the diabetes (84 children — 96% only 1–2 weeks/semester) or for other reasons (78 — 90%) did not correlate with the scheme of the treatment ( $p = 0.80$  girls;  $p = 0.96$  boys). It was also revealed that boys ( $0.01 < p < 0.05$ ) and younger children ( $p < 0.02$ ) had a better acceptance of diabetes.

**Conclusion.** The social conditions of diabetic children cannot form a basis for clinical assessment of the course of the disease. Adolescent girls tend to accept their disease less well than other children and young people.

**key words:** diabetes mellitus type 1, children, socio-economic factors

## Introduction

Chronic disease forms part of the every-day life of the patient. Insulin-dependant diabetes mellitus (type 1) in children as such makes its presence felt each day. It starts abruptly and has no end and therefore has a great impact on some or all of the social and economic aspects of life. On the other hand, the course of the disease may be influenced quite strongly by the socio-economic status of the patient or the patient's family. One question to be answered, then, is whether the educational level of the patient's parents, or any other parameter, might be linked to better or worse management and treatment of diabetes.

Records are available on this but as yet no clear statement has emerged. The aim of our study was to analyse selected socio-economic factors to evaluate their influence on the course of the disease in children with type 1 diabetes mellitus.

## Material and methods

A group of 87 children with type 1 diabetes mellitus, or their parents in the case of very young children, completed a questionnaire (Table 1) during a diabetes residential course held at Rusinowice, Poland during the summer of 2002. The course was attended by 44 girls and 43 boys aged  $13.4 (\pm 3.1)$  years. The mean duration of their diabetes was  $4.2 (\pm 3.0)$  years and the patients presented good metabolic control (mean  $HbA_{1c}$   $7.4 \pm 1.6$ ). The questions put to the children on the form were divided into the following 3 groups: general information, family background and "you and your diabetes". The patients were asked about their parents and

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siblings, school, their likes and dislikes and fear and shame associated with diabetes.

The statistics were drawn up with the use of the  $\chi^2$ , G and Mann-Whitney U test. Where needed the Cramer index was also used.

## Results

After analysis of all the data the following results were observed. One of the parameters investigated was shame of the disease. On evaluation, this was positively correlated with the will to inform friends, family and other people of their diabetes, as well as with injecting insulin in public places (both  $p < 0.001$ ). However, it had no impact on acceptance of the disease. Nor was it related to such factors as sex, number of siblings, domicile, whether living with one or both parents, the missing of lessons at school, mean grades at school or parental educational levels and nature of employment. When links for acceptance of the disease were examined only a few positive matches were found. It would seem that boys have a better acceptance of diabetes ( $0.01 < p < 0.05$ ), as do younger children ( $p < 0.02$ ), the children having been divided into two groups, those below 10 years and those above 10 years of age. There can be no denying either that a relationship of some sort exists between HbA<sub>1c</sub> levels and shame about and acceptance of diabetes. Although the mean HbA<sub>1c</sub> was the same for both groups (7.27%), the dispersion of the values within the group that does not accept the disease is smaller and all are equal or below 10%. Other factors, such as the age of the parents at the time of the child's birth, at present, the child's age when diabetes was diagnosed and the duration of the disease.

A further topic studied was parental educational level. It turned out that neither this parameter ( $p = 0.63$  for girls and  $p = 0.76$  for boys) nor the child's domicile ( $p = 0.62$  for girls and  $p = 0.12$  for boys) had a significant influence on the pattern of insulin therapy used. Maternal level of education did not correlate with the insulin treatment scheme either ( $p = 0.62$  for girls and  $p = 0.76$  for boys) or with the development of late complications of diabetes ( $p = 0.79$  for girls and  $p = 0.46$  for boys). The pattern of insulin therapy was not related to the missing of lessons at school in connection with diabetes (84 children — 96% only 1–2 weeks per semester) or for any other reason (78 children — 90% at respective frequency) ( $p = 0.80$  for girls and  $p = 0.96$  for boys).

## Discussion

Despite the continued effort of diabetological teams, appropriate standards of care and treatment of children

with diabetes have not been fully reached. It is estimated that only one third of all children achieves the recommended levels of metabolic control [1]. These unsatisfactory results of care make the search for the causes of this situation a matter of urgency. Socio-economic and emotional factors seem to be at least partly responsible.

A. Delameter et al, after research on a group of 156 children with diabetes, found that the quality of life of those with the disease was worse than that of their peers. However, this was not an outcome of the therapeutic procedures (the pattern of treatment of diabetes or ratio of metabolic control), but was related to sex, age and the psycho-social functioning of the children with diabetes [2].

The results obtained demonstrate that most of the socio-economic factors had no impact on the course of the disease. This would confirm the studies carried out by Marteau et al, who concluded that there was no relation between the educational level, social class or employment status of either parent and diabetic control [3]. The same finding, that socio-economic status has no impact on the quality of diabetes care, was presented by Edwards et al [4].

However, other studies have yielded very different results. Larsson et al suggested that low HbA<sub>1c</sub> correlates with a lower educational level and more days missed from school [5]. Another study, by Forsander et al, led to the conclusion that social factors are crucial in glycaemic control [6].

It is difficult to judge whether or not these discrepancies are a result of the different populations examined. It is clear, however, that more studies need to be carried out on this subject. Not only is it important from the scientific point of view, it is also indispensable for the treatment of diabetes.

In our investigation lack of acceptance of the disease was observed mostly among teenagers (children of over 10 years old), especially among girls. Further evidence for the lower degree of acceptance of diabetes presented by adolescent girls is given by another issue. One of the most common problems for this group is that of eating disorders [1]. Obtaining and maintaining good glycaemic control of the disease and satisfactory self-management is also most difficult for the teenage girls [7]. It seems that the pattern of psychological reaction to stress can be the explanation for the lack of acceptance of diabetes in adolescents, especially girls [8]. It is characteristic of this age group, including girls, to follow an emotional pattern of response to stressful situations [9]. A pattern of behaviour founded on an emotional reaction to some extent prevents the patient with a chronic disease such as diabetes from gaining proper metabolic control and maintaining a good quality of life [10].

## Conclusions

The social conditions of diabetic children cannot be taken as a basis for clinical assessment of the course of the disease.

Diabetic adolescent girls tend to have the lower level of acceptance of the disease.

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**Table 1.** The questionnaire

Identification number: .....

Date of birth:...../...../..... Date of diagnosis of diabetes: ...../...../..... Method of treatment (how many times per day do you take your insulin?):.....

Your: weight ..... height ..... HbA<sub>1c</sub> (glycated haemoglobin) .....

Do you suffer from:

— changes in the eye fundus?	Y / N
— hypertension?	Y / N
— proteinuria (microalbuminuria)?	Y / N

Do you suffer from any other disease?

— of the thyroid gland?	Y / N
— from coeliac disease?	Y / N
— others? (specify) .....	

Does anybody in your family suffer from (please specify who):

— diabetes .....	
— hypertension .....	
— thyroid gland disease .....	
— others (specify) .....	

Who is supervising your diabetes?

— a doctor from the specialist outpatients department for the diabetic children in .....	
— a doctor from the outpatients department for diabetic adults?	
— your G.P?	
— others?	

Where do you live?

in a large city	<input type="checkbox"/>	in a town	<input type="checkbox"/>	in a village	<input type="checkbox"/>
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**Family**

Are your parents alive? Y / N (if not then please enter the cause of death)

.....

How old are they? ..... Mother ..... Father .....

Do you live with them? Y / N

If your parents are divorced state who you live with .....  
and when they divorced .....

Do you have any brothers or sisters? (Enter the names and the dates of birth — year) .....

.....

Who in your family is in paid work? Mother Y / N Father Y / N Brothers or sisters Y / N

Is anyone in your family unemployed? (If so, state who and since which year) .....

Do they have other sources of maintenance? .....

What level of education did your mother reach? (tick the right answer)

primary  secondary  higher  technical

What is your mother's occupation? .....

What level of education did your father reach? (tick the right answer)

primary  secondary  higher  technical

What is your father occupation? .....

What is the size of your home? .....

How many rooms are there? .....

Is there a bathroom? Y / N

How many people live there? .....

Who takes care of your diabetes? (tick the right answer)

only you  mother  father  brother or sister

What school do you attend? ..... Class .....

Do you like school? Y / N

Are you a good pupil? (what is your average grade) 1 2 3 4 5 6

How often did you miss school because of diabetes last term? (tick the right answer)

rarely  not often  often  very often

one week per term up to two weeks per term up to a month per term over a month per term

How often do you miss school for reasons **other** than diabetes? (tick the right answer)

rarely  not often  often  very often

one week per term up to two weeks per term up to a month per term over a month per term

Do you take part in PE lessons? Y / N Rarely

If not or rarely, then explain why? .....

Is this because of diabetes? ..... Y / N

Do you do any sports? Y / N which .....

Do your friends or your class know about your diabetes? Y / N

If you haven't told them, why haven't you? .....

Is there glucagon in your school? Y / N

Are you ashamed of your diabetes? Y / N

Who do you want to be in the future? .....

**You and your diabetes**

What is the greatest problem for you?  
(rate on the scale: 1 — small, 2 — average, 3 — great)

Eating: ..... Self-control, blood and urine testing: ..... Insulin administration: ..... You just don't like it .....

Hypoglycaemia ..... Others .....

Do you inject insulin in public places? Y / N

If not, then why? .....

Do you carry your pen with you? Y / N  
 If not then why? .....  
 Do you think you know a lot about your diabetes? (rate using the scale: 1 — a little, 2 — enough, 3 — a lot ) .....  
 .....  
 What more would you like to learn about diabetes:  
 — how to prepare your meals and calculate their calories and fat content and understand their influence on your diabetes? Y / N  
 — method of insulin treatment? Y / N  
 — the influence of exercise on diabetes? Y / N  
 — others? .....  
 Do you use computer programs to extend your knowledge about diabetes? Y / N  
 Has your attitude towards your diabetes been to accept it? Y / N  
 Has your parents' attitude been one of acceptance? Y / N