Type 2 diabetes: is it serious?

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Introduction

There is a common perception that type 2 diabetes treated with diet is a mild form of the disease. This study set out to determine whether severity beliefs of people with type 2 diabetes are related to the treatment mode. A significant relationship was demonstrated, but the concept of diabetes severity is complex and multifactorial. The findings have implications for the way that diabetes education is delivered, especially at diagnosis.

ARTICLE POINTS

1 Diet-treated diabetes is often incorrectly viewed as mild diabetes.

2 Insulin treatment is commonly believed to indicate serious diabetes.

3 The severity of diabetes is believed to progress along a continuum from mild (diet treated) to serious (insulin treated).

4 Severity is believed to change with changes in treatment.

5 Severity rating was not correlated with blood glucose control, duration of diabetes, or the presence of complications.

KEY WORDS

- **Type 2 diabetes**
- **Serious**
- **Treatment mode**

Diabetes is a serious disease because of its potential to cause complications that result in significant morbidity and mortality. Diet-treated type 2 diabetes is often regarded as a 'mild' form of the disease. Complications occur largely as a result of inadequate blood glucose control. Type 2 diabetes and its complications can be present without any of the classic symptoms of diabetes, and 50% of newly diagnosed diabetics have complications present at diagnosis, suggesting that onset of type 2 diabetes probably occurs at least 5 years before diagnosis (Harris, 1993).

The absence of unpleasant symptoms gives little incentive for diabetics to reduce elevated blood glucose levels, or to believe that a disease which does not cause any problems is serious (Polonsky et al, 1991). Increased adherence to treatment regimens has been reported if symptoms are present (Cosby and Houlden, 1996). Consequently, attitudes rather than symptoms are likely to influence motivation to achieve good blood glucose control.

Anecdotal evidence suggests that the treatment mode is often viewed as an indicator of diabetic severity by both people with diabetes and health professionals. Statements such as 'varying degrees of disease severity', and 'insulin-using patients have more severe diabetes than non-insulin-treated subjects' (Davis et al, 1988) are not uncommon. The terms 'mild', 'moderate' and 'serious' were used by Hoet in 1991, during a presentation at the 15th International Diabetes Federation Congress in Japan, to refer to diet-, tablet- and insulin-treated diabetes respectively (Hoet, oral presentation 1991). Similarly, Ruderman (1995) referred to diet-treated diabetes as 'mild' in a presentation to the annual meeting of the Australian Diabetes Society in Melbourne.

Maintaining adequate blood glucose control requires considerable self-management on the part of the person with diabetes. Diabetes education must emphasise attitudes and beliefs as intervening variables between knowledge and self-care behaviours. Studies have shown that knowledge and behaviour are poorly correlated, and a minimum threshold of knowledge has been proposed, after which factors such as attitudes and motivation are likely to be of greater importance (Lockington et al, 1988; Day, 1997). Understanding psychosocial factors is therefore critical in determining individual treatment outcomes and self-care potential. Perceptions of diabetic severity are one such factor.

People with type 1 diabetes are often acutely ill at diagnosis and are commenced on insulin at the outset of treatment. People with type 2 diabetes usually only commence insulin treatment after a varying amount of time on diet and/or oral hypoglycaemic agents (OHAs). The perceived disadvantages of injecting insulin often outweigh the perceived benefits to these people, and the increased complexity of the treatment may be seen as indicating increasing severity of diabetes.

If diabetes is not viewed as serious, expectations about disease outcomes can be unrealistically optimistic and lead to denial, avoidance of self-care practices and

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preventive actions, and delay in seeking medical advice. Delay in seeking advice contributes to the morbidity and mortality associated with diabetes.

Some studies have shown that people with diabetes believe it to be a serious disease (Anderson et al, 1990), but few studies have specifically examined severity beliefs according to the treatment mode. A study was therefore undertaken to determine whether there was a connection between treatment mode and a belief that diabetes is a serious disease.

Aims of the study

The study aimed to:

- Test the hypothesis that people with type 2 diabetes rate the severity of diabetes according to the treatment mode.
- Ascertain the reasons for their beliefs.

Definitions of terms

For the purposes of the study, dictionary definitions of mild, moderate and serious disease were used:

Mild — The disease carries little threat to health at the present time or in the future

Moderate —The disease is more likely to affect health than mild disease, but is not as extreme as serious

Serious — A grave disease which is a threat to health and is viewed as important.

Methods

A one-shot cross-sectional survey, using well-validated questionnaires (Dunning and Martin, 1996), was used to collect data from people with type 2 diabetes attending the diabetic outpatient clinic of an acute care university teaching hospital in an inner-city area.

The total type 2 diabetic outpatient population comprises approximately 1500 patients aged from 40 to 100 years. Patients are on a range of diabetic treatments (diet, OHAs, insulin, or a combination of OHAs and insulin). Both newly diagnosed people and those with long-standing diabetes attend the clinic. No treatment interventions were undertaken as part of the study, but some patients may have required a medication change before or during the study, based on their individual metabolic parameters. This was foreseen, and considered likely to contribute valuable insights into beliefs surrounding the need for different diabetes management strategies. Every tenth patient presenting to the clinic was invited to participate after a random start using a table of random numbers.

Demographic data collected included age, sex, education level, ethnic background, current and past treatment modes and duration of diabetes. Metabolic data comprised random capillary blood glucose measured by the Medisense precision blood glucose meter (Medisense, Australia), glycated haemoglobin (HbA_{1c}) assayed by high-pressure liquid chromatography, the type and presence of any complications of diabetes, and height and weight.

Results

A total of 153 subjects were interviewed, representing approximately 10% of the sampling population.

Demographic and metabolic data

Sex, age and duration of diabetes: The study subjects comprised 78 males (51%) and 74 females (49%), with an age range of 27–85 years (mean 62.8 years ± 10.75 standard deviation (SD); median 63 years).

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1 Few studies have examined whether patients' beliefs about the severity of diabetes is related to treatment mode.

2 Approximately 10% of the total type 2 diabetic population attending an outpatient clinic in Melbourne, Australia, took part in the study reported here.

3 Subjects were on a range of diabetic treatments.

4 Both newly diagnosed patients and those with longstanding diabetes were included.

Table 1. Treatment modes of study patients

Treatment	No. of subjects	% of subjects (n=153)
Diet	10	6.5
OHAs	63	41.2
Insulin	76	49.7
Insulin and OHAs	3	2.0

OHAs = oral hypoglycaemic agents

Table 2. Patients' perceptions about why their diabetic medications were changed

Reason for the change	Response (%)
Tablets not strong enough/not working anymore	22
Doctor said so	18
Blood glucose too high	18
Symptoms (thirst, excessive urination, lethargy)	4
Following surgery	4
Own fault: incorrect diet	2
Blood glucose too low	2
Don't know	30

Table 3. Diabetic complications and risk factors in the order of frequency of occurrence*

Complication or risk factor	Frequency of occurrence (%)
Hypertension	32
Eye disease	20
Peripheral neuropathy	18
Cardiac disease	12
Peripheral vascular disease	11
High blood lipids	9
Kidney disease	6
Previous stroke	4
Autonomic neuropathy, including impotence	4

*Some subjects had more than one complication/risk factor present

Table 4. Reasons given by study patients for believing diabetes to be a serious disease

- Need to have insulin injections
- Poor blood glucose control, especially high blood glucose levels
- Diabetic complications
- Food restrictions and not following diet
- 'Because doctor said so'
- 'No cure'

PAGE POINTS

1 Subjects had undergone a change of treatment at some time, but only two-thirds of these believed it was necessary.

2 HbA_{1c} levels in subjects using different treatment modes were similar.

3 Just under half the subjects had received some diabetes education in the 6 months before the study.

4 Only 39% of subjects believed diabetes to be a serious disease.

The duration of diabetes ranged from 0 (new diagnosis of <1 month) to 40 years (mean 11.005 ± 9.23 SD; median 8 years).

Treatment mode: The treatment modes of respondents are shown in *Table 1*. Overall, 56% of patients had undergone a change of diabetic treatment at some time and 64% of these believed that the change was necessary. The reasons offered about why their diabetic medications were changed are shown in *Table 2*.

Of those on insulin at the time of the study, 39% had previously been treated with OHAs. One subject changed from diet to insulin, 8% from diet to OHAs and one from diet to a combination of insulin and OHAs. By improving her diet and increasing her activity level, one subject changed from insulin to OHAs, and another from OHAs to diet.

Metabolic control: Random capillary blood glucose levels ranged from 3.2 to 24 mmol/litre (mean 11.73 ± 4.69 SD). An acceptable blood glucose level for the majority of subjects in our clinic is between 4 and 10 mmol/litre for 90% of tests. The mean HbA_{1c} was 8.36% ± 1.98 SD; range 4.3–15.1%). Normal HbA_{1c} in the testing laboratory is <6.6%. There were no significant differences in HbA_{1c} between the different treatment modes ($P>0.05$).

Education level attained: Only 39 patients reported their education level. Of these, 10% had completed primary school and 9% secondary school, 3% had received tertiary education and 3% had never attended school at all. The 3% with no schooling represent only four subjects, three of whom were females from non-Australian backgrounds who were born overseas. Forty-six per cent had received some form of diabetes education in the 6 months preceding the study, and 12% stated that they had never received diabetes education.

Ethnic background: The majority of subjects (64%) were Australian. The remaining 36% were from a variety of countries, predominantly Italy, Greece, Vietnam, Malta, Turkey and Lebanon. The numbers in individual ethnic groups were small.

Presence of diabetic complications: The majority of subjects (64%) had at least one established diabetic complication and/or two risk factors for complications, most commonly hypertension, hyperglycaemia and hypertriglyceridaema (*Table 3*).

Perceptions of diabetic severity: Overall, 39% believed diabetes to be a serious disease, 19% thought that diabetes was moderately serious, 22% that it was a mild disease, and 20% did not know. There was a positive correlation between subjects' general rating of diabetic severity, and beliefs about the severity of their own diabetes. The more severe subjects believed their own diabetes to be, the more serious they rated diabetes generally ($P<0.05$).

Severity rating was positively correlated with the treatment mode. As treatment became more complex (diet to OHAs, OHAs to insulin), severity rating increased (r_s 0.24, $P<0.05$). There was a weak negative correlation between general diabetic severity rating and treatment change ($P<0.05$).

There was no difference between males and females in their severity rating ($P > 0.05$).

There was an inverse relationship between diabetic severity rating and age: younger subjects rated diabetes as more serious than did older subjects.

There was no significant relationship between severity rating and random blood glucose levels, HbA_{1c}, duration of diabetes, or the presence of complications ($P > 0.05$ in each case). Subjects perceived their diabetic control, but not necessarily the severity of their diabetes, to be worse as their blood glucose and HbA_{1c} levels increased.

There was a positive correlation between diabetic severity rating and education level. Subjects with the highest education level were more likely to rate diabetes as serious ($P < 0.05$). There was no significant relationship between ethnic background and severity rating.

The reasons given for believing diabetes to be a serious disease are shown in *Table 4*. The concerns that emerged concerning insulin indicated that subjects:

- Were afraid of needles
- Felt that the more needles they required on a daily basis the greater was the severity of the diabetes
- Feared the possibility of hypoglycaemia associated with insulin injections
- Thought that injections were a nuisance and an intrusion into their lifestyles
- Believed injections to be painful
- Considered injections to be a form of addiction
- Felt that injections meant there were no other options left (they had reached 'the end of the line')
- Never wanted to go on insulin.

Some insulin-treated subjects admitted to feeling better on insulin because of improvements in their blood glucose control which resulted in fewer symptoms of poor control. However, these subjects still believed that their diabetes had increased in severity once they commenced insulin.

Knowledge of diabetic complications

The majority of subjects (74%) believed that diabetes could affect their health, 14% believed it would not affect their health, and 12% did not know. Those who felt that there would be no effect on their health expressed views such as 'there are no problems if you look after it [diabetes]'.

Of the 74% who felt that their future health would be affected, 15% also believed that the effects could be decreased by maintaining good blood glucose control. A number of possible effects of diabetes on future health were cited and fell predominantly into three main categories: the symptoms produced by inadequate blood glucose control; development of diabetic complications; and effects on lifestyle.

Most subjects were aware of the importance of having regular assessments of existing complication status, and screening for the development of new complications. However, although screening for complications is routine practice, 20% of respondents believed that regular checks of kidney function, eyes, blood pressure, feet and cardiovascular system were not necessary.

Responses to open questions

There was a pervasively negative tone in the responses from insulin-treated subjects

Table 5. Comparison of comments from the insulin-treated patient group and the diet-treated patient group

Insulin-treated subjects	Diet-treated subjects
'Get skinny and die now I'm on insulin'	'If I stick to my diet it's not serious'
'Diabetes exaggerates all other things which happen — little things add up and the blood glucose goes up'	'Not serious if I watch what I eat'
'I'll keep running now so when they start hacking my feet off I'll have done it all'	'Doctor said it's not serious, just a nuisance'
'Diabetes is a very bad disease. It interferes with my lifestyle and routine'	'Told by the doctor I only have mild diabetes if I stick to my diet'
'Unless a tram hits me first, diabetes will get me in the end'	'It is only serious if I need insulin. Sometimes it gets serious when I eat chocolate and pizza, so I stop and it's mild again'
I'd still have some fire in the boiler if it wasn't for diabetes'	
'Diabetes is an atomic bomb in the body. Every second of life is precious after diabetes — people die from it'	'It's only mild but I can't eat what I want because the sugar goes up. Insulin is the last stage and I don't want that'

PAGE POINTS

1 Younger subjects rated diabetes as more serious than did older subjects.

2 Diabetic severity rating was not related to random blood glucose, duration of diabetes or presence of complications.

3 Subjects with the highest educational level were more likely to rate diabetes as serious.

4 There was no significant relationship between diabetic severity rating and ethnic background.

PAGE POINTS

1 There was no difference between the treatment modes in terms of metabolic control.

2 Diabetic control was just adequate despite subjects' knowledge that good control helped to limit complications.

3 Good diabetic control therefore appears to be dependent on factors other than medication and knowledge.

4 A person's attitudes and beliefs about diabetes are important determinants of their ability and willingness to achieve adequate self-care.

5 Subjects viewed insulin injections as indicating serious disease and a last resort in terms of treatment.

treated by insulin, compared with those treated by diet (*Table 5*). There were no differences in responses between males and females, age groups and nationalities.

In addition, comments from patients whose treatment was changed from diet to tablets or tablets to insulin show a change in the patients' attitude to the severity of their diabetes: examples include 'I used to think I was a borderline diabetic before [commencing insulin]' and 'People on diet should really worry that they will have to go onto tablets or, worse still, insulin'.

Discussion

The demographic and metabolic data collected in this study are similar to those obtained in other samples from the same population (Dunning and Martin, 1996, 1997). There were approximately equal numbers of males and females. The mean age was 62 years, which is consistent with the clinic mean. The similarities support the generalisation of the findings of this study to the whole sampling population.

There was no significant difference between the treatment modes in terms of level of metabolic control as indicated by the average HbA_{1c} (8.3%) and random blood glucose (12 mmol/litre). Both HbA_{1c} and random blood glucose levels were only slightly higher than those usually accepted as indicating good metabolic control. This implies that insulin treatment may not necessarily have led to improved control, and suggests that good control is dependent on factors other than medication and knowledge. Control was just adequate, despite respondents' knowledge of the role of good blood glucose control in limiting complications. This is a significant finding and highlights the importance of attitudes and beliefs in a person's ability and/or willingness to achieve adequate self-care.

The majority of subjects said they were Australian but did not indicate whether they were Australian born or naturalised Australians, and the questionnaire did not ask about the distinction. The number of non-Australians was small and all cultural groups were coded together for data analysis. Subtle cultural differences may therefore have been lost in the data analysis.

Differences between ethnic groups have been reported, particularly in people living outside their country of birth. Management of diabetes and complications are particular areas where a knowledge deficiency has been reported (Hawthorne et al, 1993; Simmons et al, 1996).

The beliefs of specific cultural groups are an area worthy of further study. For instance, there is some evidence that Chinese people object to insulin injections because they are seen as permanent and something that will do them harm. Some Chinese people use traditional herbal remedies to avoid insulin injections (Diabetes Australia, 1997). Injections and monitoring blood glucose are viewed as the responsibility of health professionals by other cultural groups. Further examination of the beliefs of different cultural groups could help to facilitate the development of appropriate and culturally relevant education and management strategies.

Subjects viewed insulin injections as representing serious diabetes and increasing complexity of the treatment, and a 'last resort'. Insulin was seen as an intrusion into lifestyle. Fear of needles, the risk of hypoglycaemia from the insulin, and the consequent loss of control and possible injury that can result from hypoglycaemia were also cited as indicators of severe diabetes. Although patients feared insulin injections, they also recognised the need to improve inadequate blood glucose control; some of those who had commenced insulin after a period of treatment with OHAs reported feeling better and having more energy on insulin. However, they still believed that starting insulin indicated that their diabetes had become more serious.

A few subjects reported that diabetes became less severe if insulin was commenced, because of the expected improvement in blood glucose control, and a consequent decrease in the risk of developing complications. They based their beliefs on the findings of the Diabetes Control and Complications Trial (DCCT, 1993) which demonstrated that good control and routine screening for complications could prevent complications or decrease the rate at which they developed in people with type 1 diabetes. The DCCT has been discussed with the sampling

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1 The opinions of authority figures influence patients' beliefs about the severity of diabetes.

2 Health professionals who use terms such as 'mild' diabetes when attempting to reassure patients may encourage inadequate self-care.

3 A perceived lack of government funding for diabetic research may lead some subjects to conclude that diabetes is not serious.

4 Beliefs about diabetic severity were shown to be linked to the treatment mode

5 It is important to convey to the person with type 2 diabetes that the disease is serious.

population in continuing diabetes education forums. The majority of subjects were aware of the need for regular screening for complications as part of the ongoing management of diabetes.

Subjects were aware of the need to decrease their complication risk factors and control their blood glucose. Most of the subjects had received some diabetes education within the preceding 6 months, and some attended regular education support groups, which could account for their good diabetic knowledge base. Specific questions about the pathophysiology and causes of diabetes and personal self-care habits were not part of the study. The extent to which people are able to effectively adopt self-care practices varies and cannot be determined from the results of this study; nor is it possible to estimate whether those subjects who recognised the importance of self-care actually practised appropriate self-care and had good metabolic control.

Some interesting concepts about diabetes severity emerged from analysis of the open-ended questions. Statements such as 'the doctor said so' indicated that the opinions of authority figures influenced severity beliefs. This is important as some health professionals attempt to reassure patients with statements such as 'You don't need to worry, you only have mild diabetes'. Such statements are misleading, and may contribute to inadequate self-care and increase the risk of a patient developing diabetic complications. The findings also suggest that doctors' recommendations are important with regard to commencing insulin and that people are guided in their willingness to accept insulin by the opinion of authority figures. The perceived lack of government funding to support diabetic research indicated to a few respondents that diabetes is not serious.

Acceptance of the opinions of authority figures can affect the health behaviours that people adopt, which may in turn impact on their long-term health. In 1997 the Australian Coalition Government recognised diabetes as one of the top five national health priorities and confirmed that $7.6 million would be provided to fund the National Diabetes Strategy, but this information is not widely known in the community.

Conclusions

The hypothesis that beliefs about diabetic severity are linked to the treatment mode was supported. Subjects viewed insulin treatment as indicating serious disease, but the findings highlight the complex nature of the concept of 'serious illness'.

The underlying implications for health professional diabetes care is the importance of conveying to the person with type 2 diabetes that it is a serious disease. Insulin should be introduced as a possible treatment option that may be needed at some stage, rather than used as a threat when good control cannot be achieved using diet or OHAs. ■

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