Patients with type 2 diabetes and difficulties associated with initiation of insulin therapy in a public health clinic in Durban

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Abstract

Objectives: Many patients with type 2 diabetes are uncontrolled on maximum oral treatment. The early introduction of insulin can lower diabetes-related complications. The purpose of this study was to explore the reasons behind a perceived reluctance of patients with type 2 diabetes to commence insulin therapy despite objective evidence for the augmentation of oral treatment with insulin. Secondary objectives were to review the demographic data of these patients, to review the patients' knowledge of their disease and of insulin and to compare the knowledge and difficulties of those who agreed to be initiated on insulin with that of those who refused.

Design: The study used an observational analytical design. All uncontrolled patients with type 2 diabetes on maximum oral therapy were interviewed using face-to-face interviews with open- and closed-ended questions.

Setting and subjects: The study was conducted over a three-month period at the Phoenix Community Health Centre, a state-run institution, in Durban, KwaZulu-Natal.

Outcome measures: The education level of the patients, their knowledge of the disease, understanding of insulin, family support and fear of needles and pain were notable outcome measures.

Results: Fifty-nine patients were enrolled in the study. The mean haemoglobin A_{1c} was 9.6. Level of academic education was not associated with a willingness to start insulin therapy (p-value = 0.426). Forty-seven per cent of the patients had no understanding of insulin. Forty-four per cent of the patients were willing to initiate insulin therapy and 55% refused. There was no significant difference in knowledge score between those who accepted and refused insulin therapy (p-value = 0.554). Seventy-nine per cent of patients were afraid of the pain associated with injections.

Conclusion: As a fear of injections and needles was the only significant factor that was associated with the refusal to initiate insulin therapy (p-value < 0.001), health professionals need to address this during patient education, so as to initiate insulin treatment successfully and timeously.

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Introduction

Worldwide, in 2000, the prevalence of diabetes in all age groups was estimated to be 2.8%, and it is expected to rise to 4.4% by 2030.[1] The crude cumulative incidence of diabetes in the Indian community in Durban, KwaZulu-Natal, is estimated to be 9.5%, a rate of progression of 0.95% per annum.[2]

The high morbidity and mortality associated with diabetes mellitus makes it essential for people with the disease to control their blood sugar levels. The United Kingdom Prospective Diabetes Study (UKPDS) showed that improved glucose control decreased diabetes-related complications such as microvascular damage (nephropathy and retinopathy).[3] The UKPDS also showed that the early introduction of insulin therapy to treat patients who are poorly controlled on oral medications helps to achieve and maintain adequate glycaemic control, which reduces the risk of diabetes-related complications. Fu et al investigated the treatment outcomes of patients with diabetes and found that a fear of insulin or injections was associated with poor glycaemic control, adverse clinical and psychological effects and increased risk of mortality.[4]

The investigator's experience is that the diabetes of many patients is uncontrolled on maximum oral therapy. Treatment

indicators such as haemoglobin A_{1c} (HbA_{1c}) do not achieve acceptable targets levels of 7% or less. Standard treatment guidelines necessitate that physicians recommend that their patients augment oral hypoglycaemic agents with insulin injections after ensuring optimal adherence to oral treatment. Various patient- and doctor-related factors may contribute to a delay in initiating insulin therapy.[5]

A study that was carried out in Cape Town indicated that barriers to initiating insulin treatment included lack of doctor knowledge about insulin, lack of experience with insulin, lack of guidelines related to insulin therapy, language barriers and fear of causing hypoglycaemia. In this study, doctors also expressed their opinions on what they considered patient barriers to be. These included misconceptions about insulin, concerns about non-compliance, lack of understanding of diabetes, a preference for using traditional herbs, fear of injections and poor socio-economic conditions. The study also identified system barriers, such as inadequate time, lack of continuity of care and financial constraints. However, the study acknowledged that a major limitation was that the patients' views were not elicited.[5]

The term "psychological insulin resistance" has been created. This refers to negative attitudes towards insulin treatment that contribute to unnecessary long delays in the initiation of insulin.[6] To address this issue of psychological resistance, the Diabetes Attitudes, Wishes and Needs (DAWN) study was carried out, in which a global psychosocial survey was undertaken of 5 000 people with diabetes and 4 000 healthcare workers in 13 countries. The findings from this study indicated that healthcare workers delayed the initiation of insulin treatment until they considered it to be absolutely necessary.[7]

A comparison study between "acceptors" and "refusors" of insulin therapy was conducted in primary care polyclinics in Singapore. The Reconsider Therapy with Insulin Knowledge (RETHINK) study showed that "refusors" had more concerns about insulin injections than acceptors. The primary barrier to starting insulin therapy was a perception that significant pain would be associated with the injections.[8]

The findings of the Injection Impact Report survey released by the American Association of Diabetes Educators showed that 33% of patients who required insulin for their diabetic control also experienced dread in relation to insulin injections.[9] In a study carried out on Bangladeshi patients in London, it was found that 20% of the patients refused to commence insulin therapy, despite repeated counselling. Data were collected in focus group discussions rather than through in-depth interviews, which may have elicited better responses.[10]

For many patients, delays in the initiation of insulin therapy could occur because they perceive the need for insulin therapy to be a personal failure, preferring treatment options such as diet, exercise and oral diabetic medications.[11] Once a diagnosis of type 2 diabetes mellitus has been made, patients should be made aware that they will eventually require insulin as a consequence of the natural course of the disease, and not because of a failure on their part.

The aim of this study was to explore the reasons behind a perceived reluctance by patients with type 2 diabetes, who attended a public health facility, to commence insulin therapy, despite objective evidence for the need to supplement their poor control on oral agents. The objectives were to review the demographic data of these patients, to review their knowledge of their disease and of insulin, to explore their difficulties with the current treatment methods and to compare the knowledge and difficulties of those who agreed to be initiated on insulin with that of those who refused. The results of the study will assist in the development of a strategy to address problems that are associated with a reluctance to initiate insulin therapy.

Written informed consent was obtained from all the participants and approval for the study was obtained from the Biomedical Research Ethics Committee of the University of KwaZulu-Natal.

Method

The study used an observational analytical study design that compared the data of patients who were willing to initiate insulin with the data of those who refused insulin therapy. The study was conducted over a three-month period (from 1 January 2009-31 March 2009) at the Phoenix Community Health Centre, a busy primary healthcare facility in the suburb of Phoenix, north of Durban.

The study population comprised uncontrolled patients with type 2 diabetes on maximum oral treatment who required the addition of insulin therapy. Patients were considered to have uncontrolled diabetes if they had more than one elevated HbA_{1c} level (above 7%), and if their blood sugar profiles were greater than 8 mmol/l on two or more successive visits. The sample was chosen from patients who presented to the clinic over the three-month period. Inclusion criteria were patients with type 2 diabetes over the age of 18 who were on maximum oral treatment and who were willing to participate in the study. Only patients of Indian descent were eligible for inclusion in the study. According to the South African Standard Treatment Guidelines developed by the Department of Health in South Africa,[12] maximum oral therapy is defined as two drugs from two different classes of oral hypoglycaemic agents. Patients with diabetes who were not on maximum oral treatment, and those who refused participation, were excluded from the study.

Data were collected using face-to-face interviews with open- and closed-ended questions. Interviews were conducted by a nurse educator who was based at the clinic. Differences in the knowledge of diabetes and insulin among those who accepted and those who refused insulin were compared using t-tests and chi-square tests.

Statistical analysis

SPSS® version 15 was used to analyse the data. A p-value < 0.05 was considered to be statistically significant. Pearson's chi-square tests and independent t-tests were used to examine the associations between knowledge and attitudes and willingness to start insulin therapy.

Results

Table I explores various perceptions of patients with diabetes who were uncontrolled on their oral medications and who needed to initiate insulin.

Fifty-nine patients were enrolled in the study. Of the sample population, 26 (44%) were willing to initiate insulin therapy and 33 (56%) refused, despite medical advice to do so.

There was no significant difference between those who accepted and those who refused insulin therapy regarding their knowledge score about insulin (p-value = 0.554). There was also no significant difference regarding patients' understanding of insulin among those who accepted and those who refused insulin therapy (p-value = 0.060), although this may differ in a larger sample size. A relatively high percentage of those who did not know anything about insulin were willing to accept the suggestion of the clinician and initiate insulin treatment.

Being afraid of needles was the only significant factor that was associated with refusal to initiate insulin therapy (p-value < 0.001). Of all the interviewed patients, 79.7% claimed that they were afraid of pain, 5.1% said that they found it difficult to use the injection pens and 15.3% stated that they were not afraid of needles.

The ages of the patients ranged from 30-67 years. The mean was 53 years. Eighty-four per cent of the respondents were female and 15% were male.

Forty-five per cent were educated up to grade 8-12. Only 16.9% lacked any formal education. There was no association between the attained academic education level and willingness to initiate insulin therapy (Pearson's chi-square test, p-value = 0.426). Only 23 (39%) had a recent HbA_{1c} blood investigation on file. The mean HbA_{1c} level in all of these patients was 9% and ranged between 7.8-9.9%.

Patients' understanding of insulin and diabetes

Forty-eight per cent of the patients had no understanding of insulin. Fifteen per cent stated that insulin was a medicine that was used to treat diabetes. Thirty-four per cent acknowledged that insulin was used to control blood sugar. Three per cent had an idea that pancreatic dysfunction caused a reduction in insulin, resulting in diabetes.

The patients' understanding of insulin was also scored by allocating the most correct answer the highest score. Therefore, patients who answered pancreatic dysfunction scored 3, those who answered blood sugar control scored 2, medicine to treat diabetes scored 1, and don't know scored 0. The median score was 0.93 in the range from 0-3, indicating that the majority of patients had a poor understanding of insulin.

Discussion

While those patients who rejected the use of insulin had more concerns regarding its use than those who agreed to the therapy, fear of injections and needles was the only factor that contributed significantly to the decision to accept or refuse insulin therapy (p-value < 0.001). The majority of interviewed patients (79.7%) was afraid of the pain associated with injections. The finding in this study regarding fear of injections was similar to that of other studies that were conducted in different settings.[8,9]

Table I: Perceptions of patients with diabetes who required insulin

Perception	Yes, in insulin-accepting group (%)	Yes, in insulin-rejecting group (%)	p-value
Does the patient fear a hypoglycaemic coma?	46	50	0.625
Is weight gain a problem for the patient?	8	22	0.167
Has the patient been advised against insulin by others?	12	25	0.314
Has the patient seen others deteriorate clinically while on insulin?	27	34	0.365
Does the patient have home support to administer the insulin?	92	78	0.141
Has the patient seen an insulin needle before?	27	41	0.409
Is the patient afraid of needles and injections?	65	100	< 0.001

Only 39% of the patients had HbA_{1c} results. This is an indication that healthcare workers did not perform HbA_{1c} tests every six months, as required by the Department of Health treatment guidelines. The high burden of disease encountered by healthcare professionals and lack of continuity of care may be possible reasons why the Standard Treatment Guidelines are not being followed.

There was also no indication in the studied records as to whether dedicated education of patients on diabetes and its care was being carried out. Therefore, it is difficult to determine the reason for patients' general lack of knowledge of diabetes mellitus. However, knowledge seems to have had no influence on the patients' decisions to accept or refuse insulin (p-value = 0.554). The level of academic or scholastic education, rather than diabetic education, also did not determine whether the patients were willing to initiate insulin treatment (p-value = 0.426).

Common problems associated with insulin use, such as hypoglycaemia and weight gain, were not significant factors for patients who accepted or refused to initiate insulin treatment in this study. This may be due to their lack of knowledge of insulin and of their medical condition. Anecdotal evidence of the perceptions of patients and healthcare workers suggests that usually family input has a large role to play in the Indian household. Home support is readily available for most patients (83.1%). However, poor advice from others, and the patient's own experience of family members who were already on insulin, were not significant factors in their willingness to initiate insulin. In contrast, other studies have concluded that patient and family relationships are an important target for disease control.[13] A study in the UK also showed that participants were strongly influenced by the accounts of diabetes by family and friends, as well as their own experience of the illness.[14]

The treatment of type 2 diabetes requires the skills of a multidisciplinary team to ensure that patients receive the best possible treatment, supported by appropriate information and answers to their concerns.[15] A holistic treatment approach by the clinician, nurse practitioner, patient, peer support groups and nongovernmental organisations such as Diabetes South Africa is needed to improve the overall management of this very prevalent condition. This may help to resolve the problem of poor knowledge of diabetes mellitus by the interviewed patients.

In addition, continuing medical education is recommended for all staff members who work at the clinic, to ensure that they are able to adequately convey the correct information to their patients. At the first diagnosis, patients should be educated that all people with type 2 diabetes mellitus will eventually require insulin. This should be followed up with ongoing education and counselling, as well as demonstrations with insulin pen devices. Such steps may help to allay patient fears.[16]

Patient education and the demonstration of injection devices are of paramount importance for the healthcare practitioner, as well as for the patient. Appropriate diabetic education of patients regarding insulin treatment should be the responsibility of all healthcare workers who are involved in diabetic care, irrespective of the patients' academic background.

In clinical practice, the focus of the healthcare worker should be on assisting patients to overcome their fear of needles. This could be achieved by the demonstration of insulin devices by healthcare workers, perhaps venturing so far as to inject themselves with a placebo in front of the patient. More patients would be successfully and timeously initiated on insulin if these practices were implemented.

A limitation of this study was that a causal relationship could not be determined. A further confounder in this study was that patient compliance with diet and adherence to oral medications were not explored as a cause of the uncontrolled diabetes mellitus. Patients may not want to initiate insulin treatment if they are not 100% compliant with advised lifestyle measures and oral medication.

The nurse educator who interviewed the patients may have introduced bias because of her position of authority at the clinic. Using a layperson to interview patients may reduce this bias. More open-ended questions relating to the patients' understanding of insulin and diabetes should be included in the interview.

The small sample size of 59 was a limiting factor in this study.[17] Middle-aged females skewed the sample in the study population. Given the small sample size and the inclusion of Indian participants only, it would be difficult to generalise the findings to other race groups in the country. However, this study provides an overview of the knowledge of and difficulties associated with diabetes and insulin use of Indians who attend public health facilities. While it cannot be extrapolated to other populations, it may serve as a key to how healthcare workers should approach their patients' diabetic education and management.

Conclusion

Early initiation of insulin therapy is essential in the management of type 2 diabetes when poor glycaemic control is present. The study has revealed that the most significant factor in the refusal of insulin treatment was a fear of needles. While a number of other factors may have contributed to the patients' concern about the therapy, this fear was not addressed adequately by health professionals at the clinic. As a result, the patients' diabetes status was not managed optimally.

Greater attention needs to be paid by healthcare workers to assist patients in overcoming their fear of needles. This study highlights the need to address this fear in the general population who attend public health clinics, to prevent it becoming an obstacle in the management of a life-threatening condition that can be treated. If more patients were successfully initiated on insulin therapy, the burden of diabetic complications could be reduced and the patients' quality of life improved.

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