

Quality of Life and Insulin Therapy in Type 2 Diabetes Mellitus

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ABSTRACT

Background: A frequently cited barrier to insulin use in type 2 diabetes mellitus (DM) is concern about the adverse effects on quality of life. Results of studies in this area have been mixed, with insulin use showing decreased, enhanced, or no impact on quality of life.

Objective: The purpose of this paper is to discuss the state of the science regarding the effects of insulin on quality of life and to present strategies providers can implement in their clinical practices to decrease barriers to insulin use among patients with type 2 DM.

Methods: An English-language MEDLINE search of the current literature using the terms *insulin* and *quality of life* was conducted for this article.

Results: Although patient-identified concerns regarding insulin use represent some aspects of quality of life, study results have been mixed. However, 2 large studies examining the use of insulin glargine and its effects on quality of life found that glargine was associated with significantly greater improvements in quality of life when added to oral antidiabetic agents (OADs) than was the use of OADs alone. Another study examined the effects of intensive multi-therapy (monthly visits, self-management diabetes education, and medication adjustments) on quality of life among patients with type 2 DM and found that quality-of-life scores improved among patients who initiated insulin therapy during the trial. The effects of insulin delivery systems on quality of life have also been assessed. In these studies, patients preferred insulin pens over vials and syringes and inhaled over injected insulin. Health care providers can facilitate acceptance of insulin by employing strategies to help patients overcome psychological barriers to insulin therapy.

Conclusions: Although patient concerns about the effects of insulin use are legitimate, insulin therapy is often needed to achieve treatment targets. Providers can reduce the impact on quality of life by addressing barriers, helping patients improve metabolic control, and providing ongoing information and support. (*Insulin*. 2008;3:31–36) © 2008 Excerpta Medica Inc.

Key words: type 2 diabetes mellitus, insulin, quality of life, barriers.

INTRODUCTION

In spite of the benefits of tight glucose control and newer and improved therapies,^{1,2} outcomes among patients with type 2 diabetes mellitus (DM) remain less than optimal.³ Although the reasons are many, one of the issues is the delay in implementing insulin therapy for patients with type 2 DM.^{4,5} A commonly cited reason for this hesitation is a concern that insulin therapy will negatively impact patient quality of life,⁶ in spite of the fact that the available evidence does not fully support this view. The purpose of this paper is to discuss the state of the science of the effects of insulin on quality of life and to use the evidence to develop strategies providers can incorporate into their current clinical practices.

BACKGROUND

The less-than-optimal outcomes found among patients with type 2 DM have been described by Wallace and Matthews⁵ as a “conspiracy of disease, suboptimal therapy and attitude.” Patients with type 2 DM may have erroneous beliefs about the complexity of insulin therapy.⁵ Clinicians may be concerned about the costs or other effects of polypharmacy, as well as weight gain, hypoglycemia, and atherogenic effects of insulin; they also may not feel adequately prepared to effectively manage insulin therapy, or they may lack the time or resources to provide the needed follow-up.^{5,7}

The largest study of its type, the Diabetes Attitudes Wishes and Needs (DAWN) study,⁴ examined beliefs about

insulin among patients with type 2 DM not taking insulin (n = 2061) and diabetes care providers (nurses = 1109; physicians = 2681) in 13 countries, including the United States. The results indicate that although there are significant variations across countries, patient and provider resistance to insulin is substantial.

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Among providers, delay of insulin therapy was strongly correlated with delay of oral hypoglycemic medications. Belief in the degree of efficacy of insulin was associated with the inclination to initiate or delay insulin, with just more than half of the physicians agreeing with the statement that insulin can have a positive impact on care. Cost was noted as an additional barrier to insulin therapy. Specialists, opinion leaders, and those who believed insulin was efficacious were less likely to delay insulin. Interestingly, providers who reported that their patients were more adherent to treatment with other medications and to appointment keeping were also more likely to delay insulin therapy, perhaps in the hope that these efforts would eventually result in improved glycosylated hemoglobin (A1C) levels.

Patients in the DAWN study rated the efficacy of insulin as low and indicated that they would consider themselves failures if they had to take insulin. Self-blame is lower among those who perceive they are managing their diabetes well. Insulin therapy is seen as more beneficial among patients who perceive they are not managing their diabetes well and among those who experience more diabetes-related distress. Although the DAWN study does not link patients and providers, earlier studies^{8,9} indicate that a positive provider attitude has a positive impact on patient attitudes toward insulin.

MATERIALS AND METHODS

An English-language MEDLINE search of the current literature using the terms *insulin* and *quality of life* was conducted for this article.

QUALITY OF LIFE IN PATIENTS WITH DIABETES

Quality of life is an important health outcome in its own right, as it represents the ultimate goal of all health interventions. In a review of quality of life and diabetes, Rubin and Peyrot¹⁰ define *quality of life* as physical and social function, and perceived physical and mental well-being. It includes both a cognitive and an emotional component. The dimensions underlying quality of life for people with diabetes that are generally assessed with disease-specific instruments, such as the Diabetes Quality of Life (DQOL) instrument,¹¹

include physical, psychological, and social functioning and well-being.⁶ Based on their review, Rubin and Peyrot conclude that people with diabetes have worse quality of life than do those without diabetes, specifically in the areas of physical functioning and well-being. Better glucose control generally improves quality of life, and some psychosocial factors (health-related beliefs, social support, coping style, and personality) have a powerful effect on quality of life either directly or through their capacity to buffer the negative effects of diabetes.

Diabetes complications negatively affect quality of life,^{10,12-15} as do depression,¹³ aging,^{13,15} obesity,^{13,15} and hypoglycemia.¹⁶ Women, people with a low socioeconomic status, and certain ethnic groups also report lower quality of life.^{10,12} Quality of life can be enhanced among people with diabetes by interventions that improve glycemic control, changes in insulin delivery systems, and educational and counseling sessions that support the development of diabetes-specific coping skills.¹⁰

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QUALITY OF LIFE AND INSULIN USE

Although patient-identified concerns or barriers to insulin represent some aspects of quality of life, results of studies measuring quality of life have been mixed. Studies that assess insulin use as part of overall quality of life tend to show a decrease in quality of life as the treatment moves from diet only to oral agents to insulin.^{10,12,13,15-17} On the other hand, studies comparing quality of life with specific treatment regimens and ongoing support strategies generally report no declines or even improvements in quality of life with insulin use,^{13,18-23} possibly related to better glucose control and a decrease in symptoms.

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Two large studies specifically examined the use of insulin glargine and its effects on quality of life.^{21,22} These studies found that, whereas quality of life improved for all participants, glargine use was associated with greater improvements. Vinik and Zhang²¹ compared the addition of either

glargine or rosiglitazone to sulfonylurea and metformin. Although there were similar improvements in glycemia between the 2 groups, the glargine group reported improved quality of life. The glargine group demonstrated improved mood scores and reported fewer visual symptoms, less symptom distress, and improved scores for cognitive function, cognitive distress, and fatigue distress. Rates of edema and hypoglycemia were similar in both groups, but the glargine group had less weight gain. The Implementing New Strategies with Insulin Glargine for Hyperglycemia Therapy (INSIGHT) study²² compared a regimen of early addition of bedtime insulin therapy with glargine using an insulin pen and patient-initiated titration to a regimen of optimization (addition and/or maximization of 2 agents followed by the addition of a third if needed) of oral antidiabetic drugs with no insulin. The glargine group experienced significantly greater improvements in A1C ($P < 0.001$), treatment satisfaction ($P < 0.001$), and quality of life ($P < 0.001$), with no increase in hypoglycemia. The authors hypothesize that some of the improvement could be related to a sense of greater empowerment provided by the ability to adjust the insulin dose based on blood glucose readings.

Menard et al²³ examined the effects of intensive multi-therapy on quality of life among patients with poorly controlled type 2 DM compared with usual care in a randomized controlled trial. Intensive multitherapy included monthly visits, self-management diabetes education, and medication adjustments. Whereas the 2 groups were similar at baseline in perceived quality of life, quality of life improved significantly ($P = 0.003$) in the intensive multitherapy group after 12 months. Quality-of-life scores also improved among patients who initiated insulin therapy during the trial.

The effects of insulin delivery systems on quality of life have also been assessed. Insulin pens have been evaluated in several studies²⁴⁻²⁷ and have generally been shown to improve quality of life, increase satisfaction, and decrease psychological distress related to insulin use, even though the efficacy and safety profiles are similar for pens and syringes. In these studies, patients have reported a strong preference for insulin pens over vials and syringes, less fear of injections, and greater social acceptability. They have also found them easier to use and more discreet.

Testa and Simonson²⁸ compared the impact of inhaled versus injected insulin among adolescents and adults with type 1 DM in a randomized controlled trial. They found that overall treatment satisfaction was substantially improved among patients using inhaled insulin, including satisfaction with glycemic control and side effects (primarily weight gain and hypoglycemia). These effects were similar across all ages and both genders. Quality-of-life scores for mental health symptoms, health status, cognitive functioning, and adherence barriers were significantly more favorable for the inhaled insulin group, although A1C levels were similar at the end of the 24-week trial.

Herman et al²⁹ compared pump therapy with multiple daily injections among older patients with type 2 DM and

found similar significant improvements in quality of life and glycemic control for both groups (all, $P < 0.001$). Weight gain and the number of hypoglycemic events were similar in both groups, but not excessive.

OVERCOMING BARRIERS TO INSULIN USE

The progressive nature of type 2 DM means that insulin use will be a reality for most diabetes care providers and patients. Given the strong association between improvements in glucose control and quality of life, it behooves practitioners to prescribe insulin regimens that are effective. Providing ongoing support for insulin therapy may also diminish any negative effects on quality of life.

Given the strong association between improvements in glucose control and quality of life, it behooves practitioners to prescribe insulin regimens that are effective and to provide ongoing support for insulin therapy.

In addition, providers can facilitate acceptance of insulin in their interactions with patients. Barriers to insulin have been well documented^{4,30} and are present among the majority of patients with type 2 DM who are naive to insulin. For example, more than half of the patients surveyed in the DAWN study expressed some anxiety about insulin use.⁴ Most patients express >1 concern about insulin use,³¹ and their reluctance generally represents a complex set of beliefs about what initiating insulin therapy means and their lack of skill to administer insulin, as well as a lack of information.³⁰ True needle phobia is rare.³² More-specific barriers identified by patients include^{6,30,33,34}: (1) the perceived loss of control over their lives and the loss of flexibility, (2) fear that they cannot manage the demands of insulin therapy, (3) a sense of personal failure in not managing their diabetes effectively, (4) the disruption in lifestyle or in relationships with family and friends, (5) fear that the need for insulin is a sign of more severe disease, (6) anxiety about daily injections and that insulin will not be effective, (7) fear of being perceived as a drug addict, (8) apprehension about potential side effects (eg, hypoglycemia, weight gain), and (9) the belief that insulin causes long-term complications.

There are strategies to overcome patients' so-called psychological insulin resistance.^{33,34} Providers must *elicit the patient's true personal barriers*. The first reason identified as a barrier to insulin therapy is rarely the only or most important reason. Rather than offering an opposing view, ask patients to tell you more specifically what that barrier means to them. Although "I don't want to take shots" is a common initial response, asking "What is it about taking shots that is a barrier for you?" can help clinicians and patients better understand and deal with the real barrier. Assessing the emotional well-being of all patients with diabetes using validated instruments, such as the

World Health Organization–5 Well-Being Index (WHO–5),³⁵ developed to assess well-being among people with diabetes, or the Problem Areas in Diabetes (PAID) scale,³⁶ can provide clinically relevant information. Because of the difficulty of using assessment tools in the context of a busy office practice, forms such as the Diabetes Concerns Assessment Form,³⁷ an open-ended assessment tool that can be completed in the waiting room, may help initiate discussions about overall concerns and specific barriers to insulin use.

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Providers can help to *restore the patient's sense of control*. Ask patients if they would be willing to try insulin for a short time, with the understanding that they can stop taking it if it is not working for them or is too difficult. Another way to restore control is to teach patients to titrate the dose of insulin based on blood glucose readings. Providers can also help *enhance patient self-efficacy*. Providers can teach patients how to inject insulin and then provide an opportunity to practice, or they can refer patients to a diabetes educator or nurse. If possible, providers should not make any other changes in a patient's treatment regimen at the time of insulin initiation so there is less disruption in the patient's routine. For patients with busy lives or for those who are concerned about being perceived as an addict, insulin pens may be easier to use and more discreet if they must inject in public places.

Reframe the messages about insulin therapy. From the time of diagnosis, patients should be informed that treatment will likely progress over time and that this is not due to a failure on their part to manage the disease or to an increase in disease severity, but rather to the progressive loss of β -cell functioning. Avoid using insulin as a threat, as well as statements such as "You failed oral therapy." Discuss insulin as a benefit in terms of a patient's individual concerns about diabetes. For example, having more energy for the things they enjoy may be a motivating factor for some patients, whereas avoiding complications is important for others.

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Help patients overcome their concerns and anxieties. Describe the smaller needles that are now available and point out that

the pain of injection is perceived by most patients as less than a finger prick. Point out that insulin is a "natural" drug made by the body and that diabetes is a disease of insulin deficiency. In addition, remind patients that exogenous insulin has been an approved drug for the treatment of diabetes since 1922, and no concerns have been identified by either the US Food and Drug Administration or the media. Offer realistic information about the potential for hypoglycemia and weight gain, as well as strategies to decrease their likelihood. Inform patients about the newer insulins that may decrease the chances of hypoglycemia, and let them know that the dose will be titrated gradually until an effective dose is reached. Because weight gain is a valid concern for many patients, referring patients for dietary counseling or local weight and exercise programs may help prevent the anticipated weight gain and diminish this barrier.

Loss of independence is a concern for many patients, particularly the elderly. Providing information about the prevention and treatment of hypoglycemia and the availability of community resources may help alleviate this barrier. Continuous glucose-monitoring systems have become increasingly accurate³⁸ and can be used effectively to reduce glycemic profiles and A1C levels^{38,39} by reducing exposure to hyperglycemia without increasing the risk for hypoglycemia. These devices may assist patients who live alone, have hypoglycemia unawareness, or are hesitant to take insulin because of a fear of hypoglycemia in overcoming their resistance to insulin therapy.

Although facts rarely are adequate to overcome fears, statements such as "It may help you to know that none of my patients has developed kidney disease as a result of insulin" may help reduce anxiety about long-term complications resulting from insulin therapy.

Point out the benefits of insulin. Once you have discussed the patient's concerns and barriers, point out some of the benefits, such as improved blood glucose control, enhanced mood, and more energy. Comments such as "I know that taking insulin is a big step, but most of my patients tell me that they wonder why they waited so long because they feel so much better once they start" convey understanding of the patient's concerns and a positive attitude about insulin therapy.

Insulin therapy is often needed to reach treatment targets. Providers can actively reduce any negative impact on quality of life by addressing barriers, helping patients improve metabolic control, and providing information and support.

CONCLUSIONS

Although concerns about the effects of insulin use for patients with type 2 DM are legitimate, the reality is that insulin therapy is often needed to reach treatment targets.

Providers can actively reduce any negative impact on quality of life by addressing barriers, helping patients improve metabolic control, and providing ongoing information and support either through their practices or through referral to local educators, community programs, or online resources.

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