Journal of Clinical Diabetes

Perspective Open Access

Persistence to Basal Insulin: Association with Health Outcomes in a Population with Type 2 Diabetes

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Introduction

Type 2 diabetes (T2D) is a chronic, progressive metabolic disorder that affects millions of people worldwide. In T2D, the body becomes resistant to insulin, and the pancreas eventually fails to produce adequate amounts of the hormone to regulate blood glucose levels. As a result, maintaining tight glycemic control is essential to prevent complications such as retinopathy, neuropathy, nephropathy, and cardiovascular disease.

Basal insulin therapy, which provides a steady release of insulin throughout the day, is one of the most common approaches to managing T2D, especially when oral medications or other non-insulin injectables fail to achieve adequate blood glucose control. Despite its proven efficacy in controlling blood glucose, many patients with T2D do not adhere consistently to basal insulin therapy, a phenomenon known as "persistence to basal insulin."

Persistence, in the context of medication adherence, refers to the duration of time a patient continues to take a prescribed medication, without discontinuing or altering the regimen. In diabetes management, persistence with insulin therapy is closely linked to glycemic control and health outcomes. However, poor persistence with basal insulin is common, and it is often associated with suboptimal blood glucose control and increased risk of complications.

This article aims to review the concept of persistence to basal insulin therapy, explore its association with key health outcomes in T2D, and discuss factors that influence adherence to basal insulin regimens. By understanding these dynamics, healthcare providers can design more effective interventions to enhance persistence, ultimately improving the health outcomes of patients with T2D.

Description

Insulin therapy in T2D is generally introduced when other medications (such as oral hypoglycemics) fail to maintain blood glucose control. Basal insulin provides a long-acting form of insulin that mimics the body's natural basal insulin secretion. It is designed to maintain steady insulin levels throughout the day and night, helping to control fasting blood glucose levels and manage overnight glucose fluctuations.

Basal insulin is typically administered once or twice daily, depending on the patient's needs and the specific insulin formulation used. The most commonly prescribed types of basal insulin include glargine (Lantus, Toujeo), detemir (Levemir), and degludec (Tresiba). These long-acting insulins provide a slow and steady release of insulin, reducing the risk of large blood sugar fluctuations.

Despite the effectiveness of basal insulin in managing T2D, many patients experience challenges with adherence and persistence. Factors such as fear of needles, discomfort, lack of understanding of the medication's benefits, and complex regimens can discourage patients from continuing with insulin therapy.

Discussion

Patient characteristics

Demographic factors such as age, gender, and socioeconomic status have been shown to influence persistence with basal insulin. Younger patients tend to be less adherent to insulin therapy compared to older individuals, possibly due to lifestyle factors or a sense of invincibility. Similarly, patients from lower socioeconomic backgrounds may face financial barriers to insulin access or struggle with transportation, which can negatively impact their ability to maintain regular insulin therapy.

Patients with T2D often have other comorbidities, such as hypertension, hyperlipidemia, or obesity, which may affect their ability to focus on managing their diabetes. Additionally, psychological factors, such as depression or diabetes distress, can contribute to poor persistence with insulin therapy. Studies show that depression, in particular, is common among individuals with diabetes and is linked to poor self-management and treatment adherence.

Healthcare provider interactions

The quality of the relationship between a patient and their healthcare provider is a critical factor influencing persistence with basal insulin. Strong, supportive relationships where patients feel heard and understood are associated with better adherence to diabetes regimens. Regular follow-up visits, education about the importance of insulin, and individualized care plans are key components of improving persistence.

Healthcare providers play an important role in educating patients about the benefits of basal insulin, addressing concerns about side effects, and helping patients troubleshoot issues such as injection pain or hypoglycemia. Lack of adequate education or poor communication can lead to misunderstandings about insulin therapy, making patients more likely to discontinue or adjust their regimen without medical guidance.

Medication-related factors

Patients may be less likely to persist with basal insulin therapy if they perceive the medication as ineffective or if they experience side effects such as weight gain or hypoglycemia. For instance, many patients with T2D may discontinue insulin therapy if their blood sugar levels are not immediately controlled, despite the fact that basal insulin requires time

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Received: 2-Dec-2024, Manuscript No: jcds-25-160039, **Editor assigned:** 9-Dec -2024 PreQC No: jcds-25-160039(PQ), **Reviewed:** 23-Dec -2024, QC No: jcds-25-160039, **Revised:** 27-Dec -2024, Manuscript No: jcds-25-160039(R), **Published:** 31-Dec -2024, DOI: 10.4172/jcds.1000262

Citation: Kangrui Y (2024) Persistence to Basal Insulin: Association with Health Outcomes in a Population with Type 2 Diabetes. J Clin Diabetes 8: 262.

to achieve optimal effects.

Injection-related anxiety or fear of needles is a significant barrier to persistence with insulin. Some patients may be reluctant to start or continue insulin therapy due to the discomfort or stigma they associate with injections. Advances in insulin delivery systems, such as pen devices and insulin pumps, have made it easier for patients to manage their insulin therapy. However, the need for daily injections remains a challenge for many patients.

Complex insulin regimens can also affect persistence. If basal insulin is combined with mealtime bolus insulin or other injectable medications, the complexity of the treatment plan may overwhelm patients and lead to non-adherence. Simplified regimens, such as once-daily basal insulin, have been associated with better persistence and improved health outcomes.

Health outcomes associated with persistence to basal insulin

Persistence with basal insulin is strongly associated with better glycemic control, as measured by HbA1c levels. Patients who remain consistent with their basal insulin therapy are more likely to achieve and maintain target blood glucose levels. On the other hand, poor persistence often results in suboptimal blood glucose control, leading to higher HbA1c levels and an increased risk of complications such as retinopathy, nephropathy, and cardiovascular disease.

Several studies have shown that discontinuing insulin therapy or inconsistent use of basal insulin can lead to an increase in HbA1c levels, which are a key marker of long-term blood glucose control. Research indicates that patients who adhere to their basal insulin regimen have lower HbA1c levels and a reduced risk of diabetes related complications. Persistence with basal insulin is associated with a lower risk of long-term complications. Uncontrolled blood glucose levels over time can damage organs and tissues, leading to complications such as diabetic neuropathy, kidney disease, and vision problems. Patients who maintain consistent basal insulin therapy have a lower risk of developing these complications, and when complications do occur, they are often less severe.

Studies suggest that persistent use of basal insulin is linked to improvements in patients' quality of life. By maintaining blood glucose control and reducing symptoms such as fatigue and excessive thirst, patients experience fewer disruptions to their daily activities. Moreover, patients who persist with insulin therapy tend to feel more in control of their condition, which can improve psychological well-being and reduce diabetes-related distress.

Strategies to improve persistence to basal insulin

One of the most effective strategies to improve persistence with basal insulin is providing comprehensive education to patients. Healthcare providers should educate patients about the role of insulin in managing blood glucose levels, the benefits of consistent insulin use, and the risks of non-adherence. Additionally, addressing patients' concerns about injection pain, side effects, and lifestyle factors can help reduce barriers to insulin use.

Simplifying insulin regimens can improve persistence by reducing the complexity of treatment plans. For example, once-daily basal insulin injections are easier to manage than multiple daily injections of both basal and bolus insulin. Insulin pens and other delivery devices can also make insulin administration more convenient and less stigmatized, improving patient adherence.

Conclusion

Telemedicine and remote monitoring tools can help maintain patient engagement and ensure that they are adhering to their insulin regimen. Regular virtual check-ins with healthcare providers can provide patients with the support they need to continue their therapy. Additionally, digital health tools that track insulin usage, blood glucose levels, and lifestyle factors can offer patients personalized insights and reminders to improve adherence. Persistence with basal insulin is a crucial factor in achieving optimal health outcomes for patients with type 2 diabetes. Better persistence is associated with improved glycemic control, reduced risk of complications, and enhanced quality of.

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