Improving Quality of Life with Insulin Pump

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Introduction

Continuous subcutaneous insulin infusion (CSII) therapy using insulin pumps has transformed the management of type 1 diabetes mellitus (T1D).

T1D is a chronic autoimmune disorder that requires precise insulin management to prevent complications such as hypoglycemia, weight gain, and long-term health issues. This case report examines the impact of insulin pump therapy on glycemic control and overall quality of life in a patient struggling with traditional management methods.

Case Study

A 24-year-old male diagnosed with T1D in 2022 presented with severe hyperglycemia (456 mg/dL), an HbA1c of 14%, and diabetic ketoacidosis (DKA). Initially admitted to the ICU, he received intravenous insulin and was later transitioned to a basal-bolus regimen with frequent blood glucose monitoring (over 10 times daily). Despite this, he experienced episodes of hypoglycemia (65 mg/dL) and hyperglycemia (up to 355 mg/dL), with a total daily insulin dose (TDD) of 80 IU. The patient reported significant weight gain (over 15 kg) and expressed anxiety about potential long-term complications due to a family history of diabetes-related issues.

Treatment and Outcomes

The patient was on multiple daily injections, then on a flexible insulin regimen; little improvement in HbA1c, still complained of frequent blood glucose monitoring. The patient transitioned to an insulin pump (model 780G)with automated insulin delivery, allowing for more precise insulin delivery. This change resulted in improved glycemic control, achieving a time-in-range (TIR) of 90-100%. His TDD decreased to 45 IU, leading to fewer episodes of hypoglycemia and no DKA episodes. The patient noted substantial improvements in quality of life, including reduced anxiety and enhanced overall well-being.

Conclusion

CSII therapy is an effective and safe management strategy for T1D, resulting in improved glycemic control, decreased rates of hypoglycemia and DKA, and reduced insulin requirements. The insulin pump with automated insulin delivery significantly enhanced the patient's health outcomes and confidence, addressing concerns about diabetes-related complications.

Keywords

Type 1 Diabetes Mellitus, Insulin Pump Therapy, Continuous Subcutaneous Insulin Infusion, Glycemic Control, Hypoglycemia, Diabetic Ketoacidosis.