

Case Study: Challenges of Managing Diabetes in Commercial Truck Drivers

Jeremy B. Soule, MD, and Leonard E. Egede, MD, MS

PRESENTATION

P.A., a 54 year-old Hispanic man with a 5-year history of uncomplicated type 2 diabetes, reports to the Veterans Administration (VA) clinic for follow-up. After an initial period of partial glycemic improvement soon after diagnosis, his glycemic control has deteriorated, as reflected by hemoglobin A_{1c} (A1C) levels that gradually increased from a nadir of 8.3 to 11.1% during several years. P.A. reports fingerstick blood glucose measurements between 250 and 400 mg/dl. He complains of fatigue and endorses polyuria and polydipsia, which he attributes to hyperglycemia.

Insulin therapy has been recommended repeatedly at the clinic for the past several years but has always been refused. P.A. works as an interstate truck driver and fears initiation of insulin therapy would disqualify him from holding a commercial license. He denies needle phobia, fear of complications, or other barriers to insulin therapy. P.A. voices awareness of the risks of developing diabetes complications and the relationship between uncontrolled glucose levels and his hyperglycemic symptomatology. Because he holds a loan on his truck and driving is his sole source of income, loss of his license is perceived as tantamount to financial devastation. Despite counseling, P.A. is unwilling to consider alternative occupations. His diabetes regimen consists of high-dose oral therapy with metformin, 1,000 mg twice daily; rosiglitazone, 4 mg twice daily; glimepiride, 4 mg twice daily; and acarbose, 100 mg three times daily with meals. Counseling on lifestyle

measures for diabetes with a dietitian and diabetes educators had been pursued soon after his diagnosis, but this was only partially successful. His BMI has remained unchanged at 30 kg/m² during the past 5 years. P.A. complains of a lack of healthy food choices on the road and a tendency to snack to overcome the fatigue and boredom of the long-distance trips.

A nonformulary request for therapy with exenatide injections is declined by VA pharmacy benefits management with the suggestion of an attempt at intensified lifestyle measurements. P.A. is again referred for nutrition counseling, but despite improved adherence to a restricted diet, his blood glucose levels improve only marginally. On the second nonformulary request for exenatide, coverage is approved, and treatment is started at 5 µg of exenatide injected subcutaneously twice daily.

Follow-up 3 months after initiating exenatide

Therapy has been well tolerated after an initial period of moderate nausea. After 1 month, exenatide was increased to 10 µg twice a day. On initiation of exenatide, P.A.'s glimepiride dose was decreased 50% to 2 mg daily; however, blood glucose levels in the mid-200 mg/dl range persisted. After increasing glimepiride back to its previous dose of 4 mg daily, his blood glucose had improved significantly. Follow-up visit fasting fingerstick blood glucose measurements have decreased to the low-100 mg/dl range, and postprandial measurements are in the mid- to upper-100 mg/dl

range. There has been no hypoglycemia. Although dietary adherence is still not optimal, P.A. has lost 1 kg. Although P.A.'s fingerstick blood glucose readings had improved only about 6 weeks earlier after glimepiride was increased, his A1C level has decreased from 11.1 to 9.4% in the 3 months between his visits. Diet is again reviewed, and both the patient and his wife leave with plans of further improving their eating habits.

QUESTIONS

1. What regulatory policies affect commercial truck drivers with diabetes?
2. Are there lifestyle, occupational, and financial factors that pose barriers to optimal control of diabetes for commercial truck drivers?
3. What treatment options are available to patients who refuse insulin therapy?

COMMENTARY

In addition to a life on the road, which limits dietary options and exercise opportunities, commercial truck drivers with diabetes face a complex and largely adverse regulatory environment. Drivers who work across state lines are subject to Federal Motor Carrier Safety Administration (FMCSA) guidelines.

Until recently, FMCSA regulations completely prohibited licensing of commercial interstate drivers who require insulin therapy. However, under recent legislation, FMCSA was mandated to consider exemptions for insulin-using commercial truck drivers who could demonstrate an ability to safely operate commercial motor vehicles, and, in

September 2005, the first four waivers were granted.¹

Current regulations require drivers to demonstrate “adequate individual disease management skills” while on insulin for 1 month for type 2 diabetes and 2 months for newly diagnosed type 1 diabetes.^{2,3} Commercial truck drivers are compensated for a specialized occupational skill set that is difficult to transfer to other fields. Drivers such as P.A., who hold loans on their vehicles, face additional financial risk so that even the regulated 1-month hiatus in driving while initiating insulin would be burdensome. Accordingly, truck drivers are often unwilling to start insulin therapy, even in the setting of uncontrolled diabetes and increased risk of developing diabetes complications.⁴

Although there are no absolute criteria for when to start insulin in type 2 diabetes, most practitioners agree that patients with continued severe and symptomatic hyperglycemia despite therapy with two or more oral agents would benefit from insulin therapy. Patients refusing insulin therapy despite overt hyperglycemia pose a special challenge. For patients with occupational restrictions, such as P.A., input from social workers and occupational counselors can help in making long-term career changes. A period of disability and alternative occupational training may need to be considered.

Exenatide, a noninsulin agent, is one option for such patients. Exenatide is an analog of glucagon-like peptide 1 (GLP-1) and acts by increasing insulin release from the pancreas in a glucose-dependent fashion, suppressing glucose

release from the liver, and slowing the rate of gastric emptying. Therefore, exenatide is associated with a lower risk of hypoglycemia than sulfonylureas and insulin.⁵ This characteristic makes exenatide particularly attractive to commercial truck drivers or other diabetic individuals who particularly need to avoid hypoglycemia. However, because type 2 diabetes is a progressive disease, the eventual need for insulin therapy should be discussed soon after diabetes diagnosis. Treatment with exenatide may be helpful as an interim therapy to afford this patient group as much time as possible for financial and occupational planning. In fall of 2006, sitagliptin, an oral antihyperglycemic agent that increases endogenous GLP-1 was released. This medication might also be helpful in similar situations. Bariatric surgeries, such as gastric bypass, would also be a means of obtaining diabetes control without adding insulin. This procedure is generally reserved for patients with a BMI > 35 kg/m² and may not be offered with some health insurance.

CLINICAL PEARLS

- Commercial truck drivers with diabetes face unique challenges because of a lifestyle that limits healthy food choices and affords little opportunity for physical activity.
- Interstate truck drivers are regulated by the FMCSA. Although policies are evolving, initiation of insulin therapy requires at least a hiatus in commercial driving and may result in loss of commercial licensing and income.
- Exenatide offers a valuable

therapeutic option to truck drivers with diabetes who are failing oral hypoglycemic therapy and do not want to start insulin.

- Early counseling about the eventual likely need for insulin to control diabetes is indicated to provide patients the greatest possible amount of time for financial and occupation planning.

REFERENCES

- ¹Sandberg AM: Qualification of drivers; eligibility criteria and applications; diabetes exemption. *Federal Register* 70(215):67779, 2005
- ²Sandberg AM: Qualification of drivers; eligibility criteria and applications; diabetes exemption. *Federal Register* 70(215):67780, 2005
- ³Sandberg AM: Qualification of drivers; exemption; applications; diabetes. *Federal Register* 68(170):52441–52452, 2003
- ⁴Tewdt S: Rigged for disaster: interstate trucker rules hammer diabetic drivers. *Pittsburgh Post-Gazette* 17 January 2000
- ⁵Fineman MS, Bicsak TA, Shen LZ, Taylor K, Gaines E, Varns A, Kim D, Baron AD: Effect on glycemic control of exenatide (synthetic exendin-4) additive to existing metformin and/or sulfonylurea treatment in patients with type 2 diabetes. *Diabetes Care* 26:2370–2377, 2003

Jeremy B. Soule, MD, is chief of the Endocrine Section of Ralph H. Johnson VA Medical Center and an assistant professor in the Department of Medicine, Division of Endocrinology, Metabolism, and Medical Genetics, at the Medical University of South Carolina, in Charleston. Leonard E. Egede, MD, MS, is director of the Charleston VA Targeted Research Enhancement Program at Ralph H. Johnson VA Medical Center and an associate professor in the Department of Medicine of the Medical University of South Carolina in Charleston.