Assessment of Adherence and Healthcare Costs of Insulin Device (FlexPen®) Versus Conventional Vial/Syringe

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ABSTRACT

Introduction: Diabetes is difficult to manage and treatment involves significant lifestyle adjustments. Unlike the traditional method of insulin administration via the vial and syringe method, insulin pens might be perceived as less cumbersome and have potential to significantly increase patient adherence. Methods: Using “real world” data, we examined the differences in adherence and costs between diabetic patients using an insulin FlexPen® (Novo Nordisk Inc, Princeton, NJ, USA) and those using traditional vial and syringe administration. Using a retrospective analysis of health insurance claims data between the years 2003 and 2008, we examined patients in the FlexPen cohort and analog vial cohort. Propensity score matching was used to match these cohorts (n=532 in each) according to baseline characteristics. Results: Adjusted mean medication possession ratio when switched to FlexPen improved by 22 percentage points versus 13 percentage points when continuing to use vials (P=0.001). Diabetes-related healthcare costs when switched to FlexPen versus continuing on to use vials ($3970 vs. $4838, respectively, P=0.9368) and total healthcare costs ($13,214 vs. $13,212, respectively, P=0.9473) were not statistically different. Conclusion: Without significant addition to the cost, insulin administration with FlexPen is associated with an improved adherence among patients who switched from vial-based insulin administration.

Keywords: adherence; costs; FlexPen; insulin; real world; syringe
INTRODUCTION

Adherence to therapy is a major impact factor with respect to treatment success. For treatments such as those for type 2 diabetes, adherence to therapy can be perceived as particularly challenging as it is a lifelong chronic disease and patients may not feel the immediate consequences when skipping doses. Poor adherence to diabetes therapy, however, may have serious long-term and detrimental effects as patients are not in adequate glycemic control, which negatively affects risk of diabetes-related complications.1 Landmark studies, such as the United Kingdom Prospective Diabetes Study (UKPDS), have shown that glycemic control as measured by glycated hemoglobin (HbA1c) is a very important risk factor of complications, including blindness, amputations and cardiovascular disease.2

Type 2 diabetes imposes a significant burden on the US healthcare system. The American Diabetes Association estimates that 17.5 million Americans suffer from diabetes and that the total cost of diabetes in 2007 was $174 billion, with $116 billion direct costs to healthcare.3 Type 2 diabetes is considered to make up 90%-95% of all diabetes cases.4 Most of the burden and costs of diabetes originate from complications and treatment of complications (eg, >50% of costs are incurred in a hospital inpatient care setting).3

Thus, improvements in treatments and better adherence to treatments could benefit patients as well as healthcare plans and payers. Insulin therapy in particular can be of particular concern with respect to adherence because it is associated with hypoglycemic events, and due to the fact it is an injectable therapy, which might be perceived as inconvenient and/or difficult to administer by both patients and prescribers. Initiating and switching insulin therapy can be complicated for patients as well as prescribers, as insulin therapy, whether used in vials or pens, demands extensive patient education and training. Treatments associated with discomfort such as injections, or risk of adverse events such as hypoglycemia, might keep some patients from faithfully following treatment guidelines, thereby reducing adherence.5

Poor adherence to long-term therapies compromises the effectiveness of treatment, making this a critical issue in population health from the perspective of both quality of life and health economics. It has been shown that poor adherence attenuates optimum clinical benefit.6 Therefore, medical innovations aimed at improving adherence might provide significant positive return investments through prevention of adverse health outcomes. Ease of use coupled with safety and dosing accuracy are ways to potentially improve adherence to therapy.7,8

Insulin delivery by vial and syringe administration could be perceived as less convenient and less flexible for patients than pen-administered insulin for several reasons. The vial and syringe method requires complex dosing preparations and a longer training time, can be difficult to transport, uncomfortable for patients to self-inject, and might be associated with social stigma for some patients. Insulin delivery pens are generally easier to manage for patients and easier to teach how to use by healthcare professionals. Furthermore, pens are more discreet, easier to transport, provide better dosing accuracy, and feel less like a true injection, with less pain than the vial and syringe method.9

The present study was initiated, with the intention to analyze the impact on patient adherence, hypoglycemic events and treatment costs when switching from an insulin vial regimen to a FlexPen® (Novo Nordisk Inc, Princeton, NJ, USA) insulin pen regimen.

A study published in 2006 also set out to analyze the impact on adherence, hypoglycemia