INTRODUCTION

Type 1 diabetes (T1D) is a chronic disease characterized by the inability to produce insulin, which results in elevated blood glucose levels. Long-term elevation of blood glucose has been shown to be associated with a variety of short- and long-term complications if not properly managed [1]. Glycemic control in T1D patients can be achieved either through multiple daily injections or by using insulin pump therapy (IPT) [2]. However, there is currently a lack of real-world data with respect to the differences in effectiveness (i.e., glycemic control) of these different options.

OBJECTIVE

To investigate the relationship between IPT and HbA1c among patients with T1D.

METHODS

Data Source

Data from the 2009, 2010, 2011, and 2012 U.S. National Health and Wellness Surveys (NHWS) were used. The NHWS is an annual self-administered, internet-based survey of a nationwide sample of adults (aged 18 years) that is stratified by gender, age, and race/ethnicity to represent the demographic composition of the U.S. adult population.

Analyses

Chi-square tests and t-tests were used to test for sociodemographic and health history differences between patients using IPT and not using IPT. Multinomial logistic regression models were used to examine the relationships between IPT and HbA1c. IPT was the predictor of interest with sex, race/ethnicity, education, marital status, household income, health insurance possession, employment status, smoking, and years diagnosed with T1D as covariates.

All analyses used p<.05 as the cutoff for statistical significance.

RESULTS

Of the 1,833 patients who reported being diagnosed with T1D and were currently using insulin, 495 reported using IPT (27%). Among other differences, patients using IPT were more likely to be female (51.1% vs. 42.5%), non-Hispanic white (80.5% vs. 68.3%), insured (96.4% vs. 84.5%), and to have been diagnosed for longer (26.8 vs. 21.1 years) (see Tables 1 and 2).

Patients using IPT also reported significantly lower levels of HbA1c (7.2% vs. 7.5%, p<.05) (see Table 3). Although not significant, there was a trend for patients using IPT to be less likely to report HbA1c levels 9% or more than to report HbA1c levels 7% (p=0.83, OR=0.49, p<.05). Although not significant, there was a trend for patients using IPT to be less likely to report HbA1c levels 7% or more (%) 9% or more (%) (see Tables 3 and 4).

CONCLUSION

T1D patients with greater healthcare access were significantly more likely to use IPT. However, even after adjusting for differences in healthcare access and other variables, a significant effect of IPT was observed on HbA1c. Patients using IPT were significantly more likely to be controlled than uncontrolled. These results suggest that IPT may be associated with greater real-world effectiveness, though additional research is necessary, particularly around the mechanisms of this relationship.