

INPATIENT AND INSULIN COSTS AMONG TYPE 1 DIABETES PATIENTS TREATED WITH SENSOR-AUGMENTED INJECTION VERSUS SENSOR-AUGMENTED PUMP THERAPIES

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Introduction

Continuous glucose monitoring (CGM) has been proven to enhance the clinical outcomes of type 1 diabetes (T1D) patients. Sensor-augmented injection (SAI) uses CGM with multiple daily injections (MDI) and Sensor-augmented pump (SAP) therapy uses CGM with continuous subcutaneous insulin infusion (CSII), respectively. Clinical studies show subgroups of both CSII and MDI with CGM have a significant reduction in HbA1c (1,2). While studies continue to compare CGM use with CSII and MDI, there are few showing cost differences between these two treatments. In this analysis, we compare SAP with SAI to explore the cost differences in inpatient and insulin utilization.

Materials and Methods

Data Source

We utilized Truven Health MarketScan® Commercial Database containing claims from the United States.

- Data included health insurance claims from years 2010 to 2014, containing data from over 90 million unique patients.
- The database included inpatient, outpatient, and pharmacy claims for all services covered by contributing health plans.

Study Population

T1D population:

Inclusion criteria:

- Diagnosis of Type 1 diabetes (ICD-9-CM: 250.X1 or 250.X3)
- Minimum of 1 year of continuous enrollment in the health plan with pharmacy benefits
- Greater than 18 and less than 65 years of age on index date

Exclusion criteria

- Diagnosis of Type 2 diabetes (ICD-9-CM: 250.X1 or 250.X3) and, at least, 1 claim of non-insulin antidiabetic drug.

SAI population:

- Having pharmacy claims of both basal and bolus insulins in 2 consecutive 6-month time frames during study period.
- Having, at least, 3 claims for CGM sensors.

SAP population:

- Having outpatient claims of insulin pump or pump supplies during study period.
- Having, at least, 3 claims for CGM sensors.

Variable Definitions

Inpatient and insulin costs from a private payor's perspective, adjusted to 2015 U.S. dollars.

Statistical Methods:

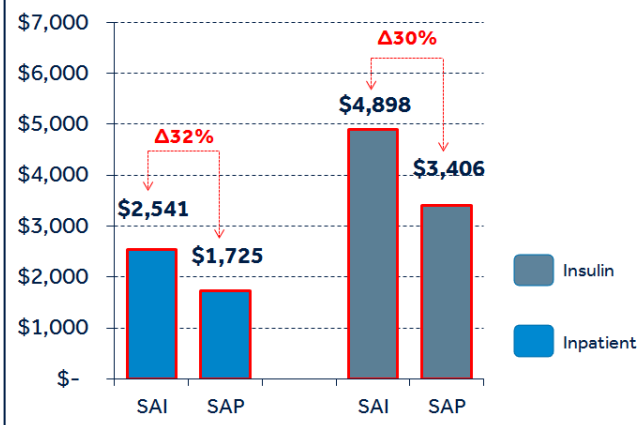
Two cohorts were matched using propensity score method based on patient characteristics: age, gender, Charlson comorbidity index (CCI), macrovascular and microvascular complications

Results

Population Descriptive Characteristics:

	SAI (N=644)	SAP (N=644)
Mean Age	45.8 (SD=12.4)	46.5 (SD=12.2)
Male %	425 (66.0%)	420 (65.2%)
Mean Charlson Comorbidity Index	1.8 (SD=1.1)	1.8 (SD=1.1)
Diabetes-related comorbidities		
Macrovascular	78 (12.1%)	91 (14.1%)
Microvascular	221 (34.3%)	246 (36.6%)

SAI vs. SAP Payer's Cost Per Patient Per Year, Type 1 Matched



Matched annual costs showed that SAP patients had approximately 32% lower inpatient costs and 30% lower insulin costs. SAI therapy showed an increased averaged length of stay in hospitals (4.4 days), compared to SAP usage (3.7 days).

Conclusions

1. According to this matched cohort analysis, costs were higher for inpatient admissions and insulin among T1D patients using CGM technology with MDI versus pump therapy.
2. These findings suggest that SAP therapy may serve as a means to reduce healthcare expenditures and improve resource utilization.

References

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2. Rodbard D, Jovanovic L, Garg SK. Responses to continuous glucose monitoring in subjects with type 1 diabetes using continuous subcutaneous insulin infusion or multiple daily injections. *Diab Tech Ther*. 2009;11:757-76