Impact of a Pharmacist-Driven Protocol to Improve Guideline-Concordant Prescribing of Diabetes Medications in Patients with Atherosclerotic Cardiovascular Disease

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Introduction

In 2014, 7.2 million hospital discharges reported diabetes as a diagnosis and, of these patients, approximately 1.5 million were hospitalized for major cardiovascular diseases (70.4 per 1000 persons with diabetes).[1] Atherosclerotic cardiovascular disease (ASCVD) is the most prevalent cause of death among patients with type 2 diabetes. A three-fold increase in mortality has been shown in patients with type 2 diabetes and cardiovascular diseases.[2]

The American Diabetes Association (ADA) issued an updated Standards of Medical Care in Diabetes in January 2018.[3] This guideline issued new significant recommendations for people with cardiovascular comorbidities. Metformin remains first-line therapy for most patients, but if A1c goal is not achieved after three months, add-on therapy is dependent on patient's comorbidities. For patients without ASCVD, add-on therapy may be chosen from any medication within one of six preferred treatment classes. Currently, empagliflozin, liraglutide, and canagliflozin are all FDA approved to reduce the risk of major adverse cardiovascular events in adults with type 2 diabetes and known cardiovascular disease.[4-6]

The purpose of this study is to determine if the implementation of a pharmacy-driven protocol is associated with an increased proportion of patients prescribed liraglutide, empagliflozin, or canagliflozin. By evaluating the impact of a pharmacist-driven protocol, this study will provide valuable information on pharmacists' roles in prescribing medications under collaborative practice in the ambulatory care setting.

Objectives

Primary:

- Determine whether a pharmacist-driven protocol improves guideline-concordant prescribing of cardiovascular risk reducing diabetes medications in patients with type 2 diabetes and ASCVD

Secondary:

- Characterize factors impacting the use of SGLT-2 inhibitors and GLP-1 receptor agonists with cardiovascular risk reduction data in patients with type 2 diabetes and ASCVD

Methods

- Retrospective cohort study
- Inclusion criteria: Age ≥ 18 years, diagnosis of type 2 diabetes and ASCVD based on ICD-9 and ICD-10 classification codes
- Exclusion criteria: Pregnant women, prisoners or wards of the state, inadequate documentation to assess study eligibility
- Intervention design included was three-pronged:
    1. Algorithm distributed to providers
    2. In-service presentation
    3. Pharmacotherapy clinic appointment

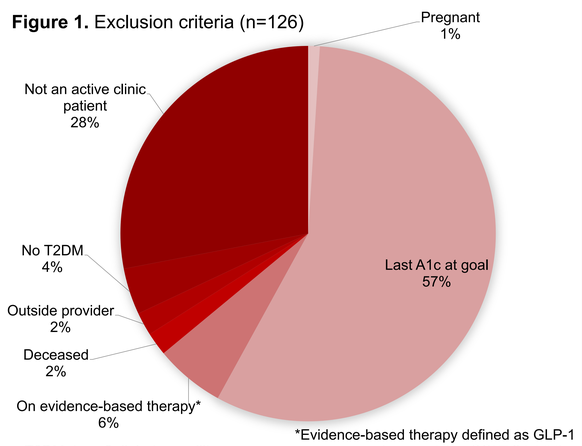
Results

Table 1. Baseline demographics

Demographic	Patient population (n=108)
Age (years) *	65.9 ± 11.5
Weight (kg) *	92.1 ± 22.6
Sex, n (%)	
Male	47 (43.5)
Female	61 (56.5)
Primary care provider, n (%)	
Physician	59 (54.6)
Mid-level provider	12 (11.1)
Resident	37 (34.3)
Payor status, n (%)	
Medicare	55 (50.9)
Medicaid	2 (1.9)
Medicaid + Medicare	22 (20.4)
Private	27 (25)
Uninsured	2 (1.9)
eGFR (mL/min/1.73m^2), n (%)	
≤ 30	13 (12)
31-44	10 (9.3)
45-60	22 (20.4)
> 60	47 (43.5)
Not documented	16 (14.8)
ASCVD diagnosis, n (%)	
Unstable angina	4 (3.7)
Myocardial infarction	7 (6.5)
Ischemic heart disease	58 (53.7)
Cerebral infarction	21 (19.4)
Atherosclerosis	3 (2.8)
Peripheral vascular disease	15 (13.9)

* Expressed as mean ± standard deviation
eGFR: estimated glomerular filtration rate

Figure 1. Exclusion criteria (n=126)



T2DM: type 2 diabetes mellitus
*Evidence-based therapy defined as GLP-1 receptor agonist or SGLT-2 inhibitor

Figure 2. Difference in prescribing rates of guideline-concordant therapy

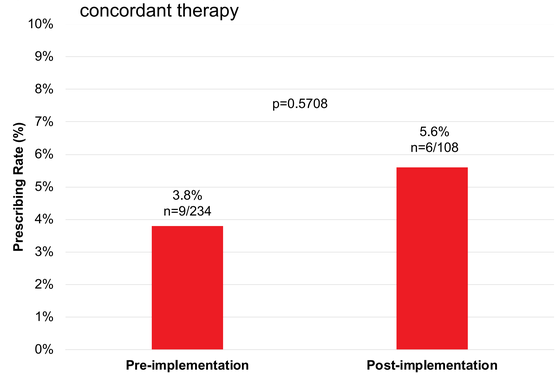
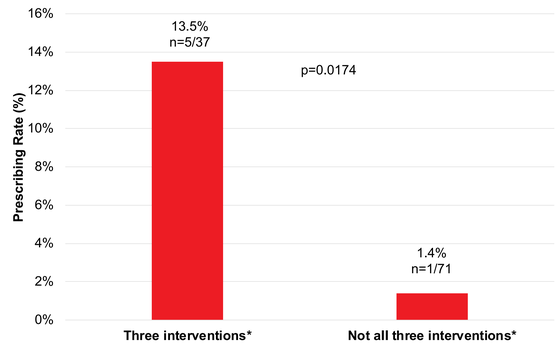


Figure 3. Difference in prescribing rates based upon interventions received



*Three interventions include: algorithm, in-service presentation, pharmacotherapy clinic appointment

Table 2. Factors affecting prescribing rates

Demographic	Odds Ratio (95% CI)
Sex Male vs. Female	0.63 (0.22 – 1.80)
Age <65 vs. ≥ 65 years	1.8 (0.58 – 5.53)
Medicaid No vs. Yes	5.62 (0.33 – 94.59)
Medicare No vs. Yes	2.67 (0.87 – 8.22)
Medicaid/Medicare No vs. Yes	0.81 (0.21 – 3.11)
Private Insurance No vs. Yes	0.15 (0.01 – 1.23)

Conclusions

In comparing pre-implementation vs. post-implementation, the rate of guideline-concordant prescribing increased from 3.8% to 5.6% in the overall population. Five patients exposed to all three prongs of intervention were initiated on evidence-based therapy; one additional patient was started on evidence-based therapy, but was not seen by a clinical pharmacist.

Documented factors limiting prescribing of evidence-based therapy in patients included achievement of glycemic control, patient refusal, insurance status, and kidney function.

Limitations

- Small sample size
- Interaction via phone required to schedule patient to pharmacotherapy clinic
- Optional provider attendance at single in-service presentation
- Inability to coordinate same day appointments with different providers in clinic

Future Directions

- Follow cardiovascular disease markers, glycemic control, and prescription of evidence-based therapy at six months post-implementation
- Explore opportunities for expansion of protocol and pharmacy services into other Texas Tech clinics

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For Further Information

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