

2023

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Recommended Citation

Dunn, Keegan; Kopel, Jonathan; Diab, Mousab; and Babb, Franklyn (2023) "Analyzing and improving the utilization of statin drugs in family medicine patients with type II diabetes," *Journal of Community Hospital Internal Medicine Perspectives*: Vol. 13: Iss. 3, Article 6.

DOI: 10.55729/2000-9666.1162

Available at: <https://scholarlycommons.gbmc.org/jchimp/vol13/iss3/6>

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Analyzing and Improving the Utilization of Statin Drugs in Family Medicine Patients with Type II Diabetes

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Abstract

Background: Statins are the primary drug used to reduce morbidity and mortality for cardiovascular disease. However, many type II diabetes mellitus (T2DM) patients who are currently not on a statin would otherwise qualify. Therefore, we investigated the proportion of T2DM patients on a statin compared to the total number of T2DM patients eligible to be on a statin. We also examined potential barriers that prevent T2DM patients from being prescribed statins by physicians.

Methods: A retrospective chart study on family medicine patients was collected data on age, race, cholesterol readings, blood pressure, and whether the patient was on blood pressure medications, aspirin, and/or a statin. The information gathered was used to determine the patients' 10-year risk of cardiovascular disease. A survey was given to residents and faculty to assess the cost, side effects, and other behavioral factors had on a patients' choice to be on a statin.

Results: Among the 706 T2DM patients, we found that a large proportion (75.2%) were both eligible and prescribed a statin according to the American Heart Association Guidelines. In addition, over 58% of the patients had a 0%–25% 10-year risk of cardiovascular disease risk. Among the 14 family medicine physicians surveyed, the fear of or history of side effects with statin medications were the greatest barriers to starting statins.

Conclusion: The large proportion of family medicine patients that were eligible were prescribed a statin. According to the survey, physicians Believed that the greatest barrier for a patient starting on a statin is the fear of or history of side effects with statin medications.

Keywords: Cardiovascular disease, Statins, American College of Cardiology, American Heart Association, 10-Year cardiovascular disease risk

1. Introduction

Cardiovascular disease is the leading cause of death in the United States.¹ Statins reduce the mortality and cardiovascular risk, particularly among high risk groups (e.g. patients with peripheral vascular disease or previous cardiovascular disease).² In recent years, an increasing number of patients have been prescribed a statin. However, many patients with cardiovascular disease or other risk factors, such as Type II Diabetes mellitus (T2DM), were found to be prescribed statins less

frequently than other patient population groups.^{3–6} Part of this disparity is a result of doctors prioritizing a patient's lipid profiles over their cardiovascular risk when making treatment recommendations to prescribe a statin.⁷ As a result, fewer statin prescriptions to high-risk patients, particularly those without a diagnosis of hyperlipidemia, were prescribed by physicians.³ Specifically, patients who were at high risk for cardiovascular events (e.g. coronary artery disease, diabetes, or both), were not prescribed a statin.^{1,4} Given these observations, we investigated whether T2DM

Received 28 November 2022; revised 25 December 2022; accepted 5 January 2023.
Available online 8 May 2023

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<https://doi.org/10.55729/2000-9666.1162>

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patients in the family medicine clinic who were at risk for cardiovascular disease were being prescribed a statin according to the American Heart Association (AHA) recommendations. In addition, a survey was given to residents and faculty using the Likert scale to determine the effect that cost, side effects, and other behavioral factors had on a patients' choice to be on a statin.

2. Methods

A retrospective chart study was performed to collect data from a total of 706 patients in our patient population. Data collected from the chart included age, race, cholesterol readings, blood pressure, and whether the patient was on blood pressure medications, aspirin, and/or a statin. The inclusion criteria for our study included patients between the ages of 40–79 with a total cholesterol of 130–320 mg/dL and HDL of 20–100 mg/dL. The information gathered was entered into the American College of Cardiology (ACC)/AHA risk calculator to determine the patients' 10-year risk of cardiovascular disease (ACSVD), if their blood pressure is well-controlled, and if they are recommended to be on aspirin and/or a statin. The survey was also given to a total of 14 residents and faculty using a Likert scale to determine the effect that cost, side effects, and not wanting to take another medication had on a patients' choice to be on a statin. We also surveyed the percentage patients the residents and/or attending physicians' thought should be on a statin compared to the percentage they believed to be on a statin. The survey was inspired from a previous study by Butalia et al. examining statin use for eligible patients in family medicine.⁸

3. Results

As shown in Table 1, our study included a total of 706 T2DM (271 male and 475 female) patients who had an average age of 60.5 years. In our population, 0.6% were American Indian, 0.8% Asian, 10.3%

Table 1. Demographic data of T2DM patient population.

	Average	Male	Female
Age	60.5	70.2	54.6
Standard Deviation	9.7	4.1	6.9
Ethnicity	Total	Male	Female
American Indian	4	0	4
Asian	6	2	4
Black	73	25	48
Latino	104	47	57
White	463	170	293
Other	9	8	1
Not Listed	47	19	28

Table 2. Cholesterol, blood pressure, and ASCVD risk in T2DM patient population.

Cholesterol and Blood Pressure	Average	Standard Deviation
Total Cholesterol (mg/dL)	178.8	38.1
HDL Cholesterol (mg/dL)	48.3	13.2
Systolic Blood Pressure (mm Hg)	133.2	17.1
Diastolic Blood Pressure (mm Hg)	79.3	10.8
10-year risk of heart disease or stroke (ACSVD %)	19.6	0.2

black, 14.7% Latino, 65.5% white, and 1.3% Other. In addition, 6.7% of the patient population had their race unspecified. As shown in Table 2, the total cholesterol (mg/dL) and HDL cholesterol (mg/dL) for the patient population was 178.8 and 48.3 respectively. In addition, the average systolic to diastolic blood pressure in this group averaged 133.2 mmHg/79.3 mmHg. The overall ACSVD for this group was also 19.6%. As shown in Fig. 1, over 58% of the patients had 0%–25% 10-year risk of cardiovascular disease ACC/AHA. Among the T2DM patients, 84.4% were being treated for hypertension. However, only 61.5% had their blood pressure controlled as defined by the ACC and AHA guidelines (Table 3). In addition, only 15.7% were current smokers. Among the T2DM patients that would benefit from aspirin, 36% of the patients were taking an aspirin daily (Table 4). In our T2DM patient population, nearly 75.2% of the patients were taking their required statin. We also found that among the 14 family medicine physicians surveyed, the fear of or history of side effects with statin medications were the greatest barriers to starting statins (Fig. 2).

4. Discussion

As shown in our study, a large proportion of family medicine patients were both eligible and prescribed a statin. According to the survey, the residents and attending family medicine physicians believed that the greatest barrier for a patient starting on a statin is the fear of or history of side effects with statin medications. This observation by family medicine physicians was similarly reported in a recent survey by Butalia et al.⁸ Specifically, Butalia et al. found that a lack of physician support for statin therapy and patient difficulties in remembering to take their medications on schedule were the primary reasons patients were reluctant to take statins. Similar to our study, many family doctors cited a lack of resources, insufficient monitoring systems, divergent specialty and primary care provider guidelines, and a lack of continuity were the primary reasons for undertreatment of

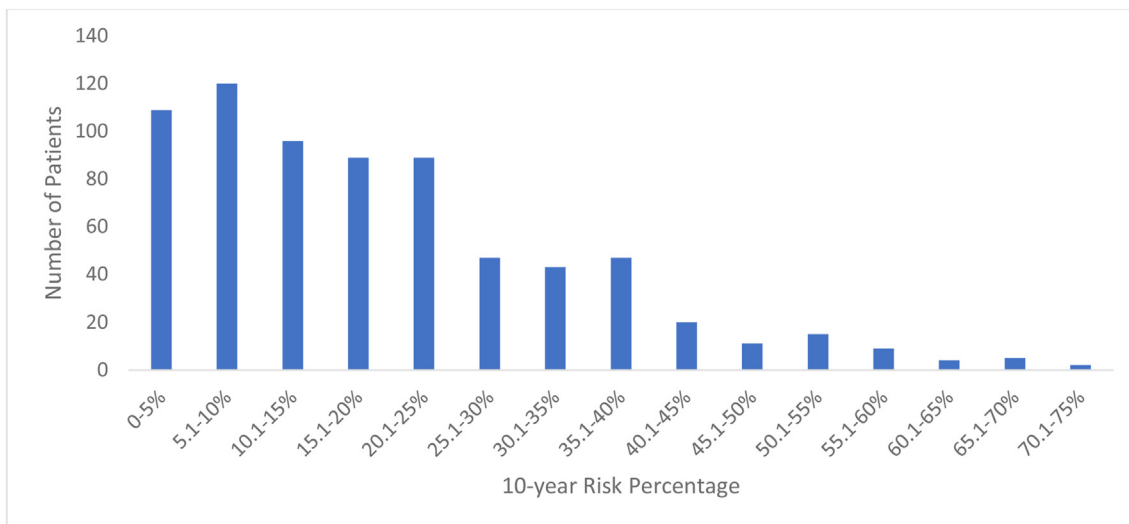


Fig. 1. 10-year risk of heart disease or stroke (ASCVD Risk) among T2DM patients.

Table 3. Blood pressure and diabetes in T2DM patient population.

Blood Pressure and Diabetes	Yes (%)	No (%)
Treated for hypertension	84.4	15.6
Blood pressure well-controlled	61.5	38.5
Smoker	15.7	84.3

Table 4. Aspirin and statin use in in T2DM patient population.

Aspirin/Statin Use	Yes (%)	No (%)
Would benefit from aspirin	17.7	82.3
Currently taking aspirin	36	64.0
Would benefit from statin	100	0
Currently taking statins	75.2	24.8

Differences in gender may also explain the disparities in statin prescriptions for patients who are eligible for them. Male patients who are eligible for statin medication typically receive statin treatment far more frequently than their female counterparts.⁹ However, male patients were less likely to receive the appropriate dosage of statin to match their cardiovascular risk despite having a higher mean 10-year atherosclerotic cardiovascular disease risk score than women.¹⁰ In addition, physician beliefs that women have lower cardiovascular disease risks is believed to cause an underuse of the current ASCVD risk estimate tools for female patients, which may explain this discrepancies in statin prescriptions among female patients.¹¹ Beyond provider biases, other studies have reported that adherence among female patients to statins may be lower due to more reports of adverse events using statins than those reported in male patients.¹²

T2DM patients with statins.⁸ When interviewed, patients suggested that education, dividing pills to maximize cost efficiency, and switching to a different statin or a lower dosage would improve their likelihood of using statins.⁸

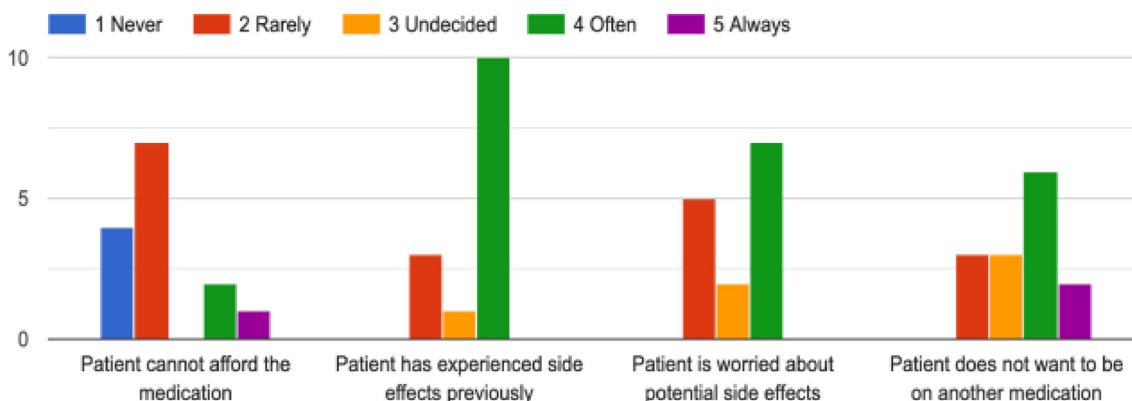


Fig. 2. Physician survey of perceived barriers to T2DM patients taking a statin.

5. Conclusion

Overall, the T2DM patients in family medicine who were eligible for statins received them. However, as noted in this study, disparities in statin prescription persist. Physicians believe that the greatest barrier for a patient starting on a statin is the fear of or history of side effects. Some limitations that affected data collection included some of the patients not having their cholesterol tested in the past year or having no history of their cholesterol being tested. In addition, some patients also had a cholesterol reading either too high or low to be input into the CV risk calculator. Further studies should examine whether statin prescriptions for eligible patients differ by medical specialty and whether specific interventions may improve statin prescriptions for at risk populations.

Author contributions

- (I) Conception and design: FB.
- (II) Administrative support: N/A.
- (III) Provision of study materials or patients: FB.
- (IV) Collection and assembly of data: KD.
- (V) Data analysis and interpretation: KD.
- (VI) Manuscript writing: KD, JK, MD.
- (VII) Final approval of manuscript: FB.

Funding

Texas Tech Family Medicine Department.

Availability of data and material

None.

Code availability

None.

Ethics approval

None.

Consent to participate

None.

Consent for publication

We consent for this manuscript to be published and reviewed.

Conflict of interest

None.

Acknowledgements

None.

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