

Any Statin Use Among Commercially Insured Members with Diabetes Age 40 to 64 without History of Atherosclerotic Cardiovascular Disease (ASCVD) and Association Between Adherence to Statin Therapy in 2014 and Adverse Cardiovascular Events in 2015

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Background

- The 2013 updated cholesterol guidelines from the American College of Cardiology (ACC) and American Heart Association (AHA)¹ recommend statin therapy for most individuals age 21 to 75 years with clinical atherosclerotic cardiovascular disease (ASCVD), defined as secondary prevention. The guidelines recommend primary prevention with statin therapy for most individuals age 40 to 75 years with diabetes mellitus (DM) without ASCVD.
- Two published studies,^{2,3} using large electronic medical record databases from time intervals prior to the new ACC/AHA guidelines found approximately 60 percent of individuals age 40 to 75 years with DM without ASCVD had a history of a statin prescription.
- In November 2016, the United States Preventive Services Task Force (USPSTF) issued a statement⁴ that targets a smaller set of individuals with DM age 40 to 75 years than the ACC/AHA by recommending primary prevention for those with a calculated ten-year cardiovascular (CV) event risk of 10 percent or greater and that clinicians only selectively offer statins to those with a ten-year event risk of 7.5 percent to 10 percent.

Objective

To determine the:

- Percentage of commercially insured primary prevention members with DM age 40 to 64 years without a diagnosis of ASCVD in 2014;
- Incidence of 2015 CV events among members with DM stratified by the ACC/AHA recommendations;
- Percentages of primary prevention members with DM age 40 to 64 years without ASCVD who (a) had any pharmacy claim for a statin, and (b) were adherent to statin therapy in 2014; and
- Association between primary prevention statin therapy in 2014 and CV events in 2015.

Methods

- A Health Insurance Portability and Accountability Act of 1996 (HIPAA) compliant limited data set of integrated medical and pharmacy administrative data for all commercially insured members from five Midwest and five Southern Blue Cross and Blue Shield clients was queried to identify all continuously enrolled members during 2014 through 2015 younger than 65 years. Among these members, all who had, in 2014–2015, either: 1) any antihyperglycemic drug claim other than single agent metformin, or 2) one inpatient or two outpatient medical claims for evaluation and management services that had a DM diagnosis code were categorized as members with DM. A random sample of 250,000 of these members with DM was then selected along with all of their medical claims incurred in 2014–2015.
- A CV event was defined as a medical claim with a procedure code for coronary bypass graft or angioplasty, or hospital inpatient claim with a diagnosis code for acute myocardial infarction or ischemic cerebral infarction.
- Claims indicating a diagnosis of ASCVD were defined as those for a CV event or with a diagnosis code for an acute coronary syndrome, stable or unstable angina, atherosclerosis of peripheral arteries, or transient ischemic attack.
- Individuals are counted only once for each of the unique CV event categories and may have had a CV event in more than one CV category. A member is counted only once for the any CV event rate assessment.
- For each member, the occurrence of any 2014 statin claim was determined along with the statin proportion of days covered (PDC) using the methodology specified by the Pharmacy Quality Alliance.⁵ Members with 2014 PDC ≥ 80 percent were defined as adherent and compared with all other members with or without a 2014 statin claim grouped together as PDC < 80 percent.
- Descriptive statistics were used to calculate incidence rates. From a two by two contingency table of statin PDC ≥ 80 percent or < 80 percent versus any or no CV event, association between exposure and outcomes was assessed using an odds ratio and chi-square test. A logistic regression model was used to calculate the odds ratio of any CV event, adjusting for sex and age.

Results

- Out of an average of about 13.8 million members per month, there were 5.5 million continuously enrolled members less than 65 years of age of which 281,221 (5.1 percent) were categorized as members with DM. 250,000 (88.9 percent) of the members with DM were randomly selected for analysis.
- As shown in **Table 1**, 204,560 (81.8 percent) of these 250,000 members with DM were age 40 to 64 years with no 2014 claims for ASCVD. These primary prevention members accounted for 3,089 (71.3 percent) of the 4,330 members with DM who had any CV event in 2015.
- In 2014, a statin claim was found for 111,856 of the 204,560 (54.7 percent) primary prevention members with DM, age 40 to 64 years with no 2014 ASCVD diagnosis. Of the 204,560 members:
 - 55,099 (26.9 percent) were statin adherent (PDC ≥ 80 percent),
 - 56,757 (27.7 percent) had at least one statin claim but were not adherent (PDC < 80 percent), and
 - 92,704 (45.3 percent) did not have a statin claim (also categorized as PDC < 80 percent).
- As shown in **Table 2**, in 2015, 682 (1.24 percent) of the 55,099 statin adherent members and 2,407 (1.61 percent) of the 149,461 with no statin claim or not adherent had a CV event. The odds of any CV event in 2015 was 23.4 percent lower among 2014 statin adherent members compared to statin non-adherent members (odds ratio 0.766, 95 percent C.I. 0.703, 0.834).
 - Assuming this 0.37 percentage point any CV event difference was entirely due to statin therapy, if all were statin adherent there would have been 557 (11.6 percent) fewer members with any CV event out of the 3,089 members who had any CV event.
 - 2,407 of the 3,089 (77.9 percent) with any CV event in 2015 either had no history of a 2014 statin claim or were not statin adherent.
- Figures 1 and 2** show the 2015 incidence of any CV event by sex, five year age groups and 2014 statin PDC ≥ 80 percent versus < 80 percent. Incidence increased with age for both sexes, was higher for males in all age groups and higher for members with statin PDC < 80 percent at all sex plus age groups (odds ratio for 2015 any CV event for 2014 statin adherent vs. not adherent, adjusting for sex and age was 0.675, 95 percent C.I. 0.619, 0.736).

Table 1. 2015 Cardiovascular Events by ACC/AHA Guidelines Recommended Treatment Categories⁶

2015 cardiovascular (CV) event categories	DM age 21-64 with ASCVD 2014 claim(s) N=16,293 (6.5%)			DM age 40 to 64 without ASCVD 2014 claim(s) N=204,560 (81.8%)			DM age 21 to 40 without ASCVD 2014 claim(s) or Age < 21 N=29,147 (11.7%)			Total DM sample N=250,000	
	N with event	% with event	% of all events	N with event	% with event	% of all events	N with event	% with event	% of all events	N with event	% with event
Acute myocardial infarction	348	2.1%	22.3%	1,173	0.6%	75.1%	41	0.1%	2.6%	1,562	0.6%
Coronary angioplasty	728	4.5%	26.4%	1,995	1.0%	72.4%	32	0.1%	1.2%	2,755	1.1%
Coronary artery bypass graft	114	0.7%	19.8%	458	0.2%	79.7%	3	0.0%	0.5%	575	0.2%
Ischemic stroke	325	2.0%	28.0%	799	0.4%	68.9%	35	0.1%	3.0%	1,159	0.5%
Any of above CV events	1,152	7.1%	26.6%	3,089	1.5%	71.3%	89	0.3%	2.1%	4,330	1.7%

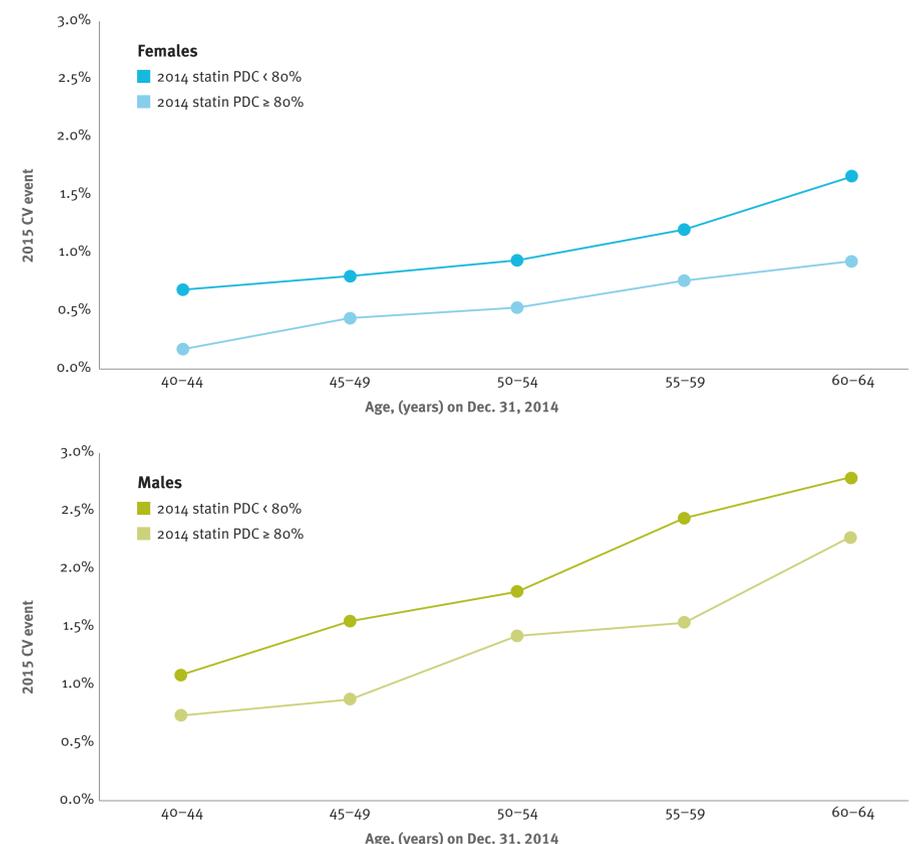
DM=diabetes mellitus, ASCVD=atherosclerotic cardiovascular disease, CV event=adverse cardiovascular event, ACC=American College of Cardiology, AHA=American Heart Association.
Note: Columns do not sum due to some members having a CV event in more than one CV event category. The 'any of above CV events' category counts an individual once regardless of how many CV events they had.
Age is in years.
Cardiovascular (CV) events were defined as a medical claim with a procedure code for coronary bypass graft or angioplasty or hospital inpatient claim with a diagnosis code for acute myocardial infarction or ischemic cerebral infarction.

Table 2. 2015 Incidence of Any Cardiovascular Event Among Primary Prevention Members with Diabetes Age 40 to 64 without a 2014 ASCVD Diagnosis by 2014 Statin Adherence

2014 statin therapy adherence	2015 any CV event				p-value	Odds ratio of event, statin adherent vs. non-adherent (95% confidence interval; 0.703, 0.834)
	Event	No event	Total	% with event (risk)		
Yes, PDC ≥ 80%	682	54,417	55,099	1.24%	p < 0.0001	0.766 (95% confidence interval; 0.703, 0.834)
No, PDC < 80%	2,407	147,054	149,461	1.61%		
Total	3,089	201,471	204,560	1.51%		

PDC=proportion of days covered.
Statin PDC calculated by Pharmacy Quality Alliance methodology. PDC < 80% included members with no statin claims.
CV event=cardiovascular event. Cardiovascular (CV) events were defined as a medical claim with a procedure code for coronary bypass graft or angioplasty or hospital inpatient claim with a diagnosis code for acute myocardial infarction or ischemic cerebral infarction.
Age is in years.

Figures 1 and 2. 2015 Cardiovascular Events Among Primary Prevention Members with Diabetes Age 40 to 64 without 2014 ASCVD Diagnosis by Sex, Age and 2014 Statin Adherence



Statin adherent odds ratio adjusting for sex and age was 0.675 (95% Confidence Interval 0.619, 0.736)
Statin proportion of days covered (PDC) calculated by Pharmacy Quality Alliance methodology. PDC < 80% includes members with no statin claims.
Cardiovascular (CV) events were defined as a medical claim with a procedure code for coronary bypass graft or angioplasty or hospital inpatient claim with a diagnosis code for acute myocardial infarction or ischemic cerebral infarction.

Conclusions

- Current practice in this commercially insured population appears to be selective use of statins for primary prevention in members with diabetes age 40 to 64 rather than following the recommendation in the ACC/AHA guidelines that nearly all of these members should be treated. In 2014, only 55 percent had a statin claim and only 27 percent were adherent to statin therapy.
- In 2015, 78 percent of these members who had any cardiovascular event either had no statin claim or were not adherent. Those adherent to statin therapy had a 23 percent lower incidence of any cardiovascular event. There is a large opportunity to improve the quality of care through increasing statin primary prevention use among individuals with diabetes 40 to 64 years of age.
- This recent real world data provides a basis for estimated program clinical event rate avoidance calculations.

Limitations

- Assigning individuals to risk categories recommended by the USPSTF requires clinical information not available from administrative claims data, e.g., laboratory values, smoking history or race. It therefore is not possible to assess compliance with these guidelines.
- Use of only one year of claims data to identify which members have a diagnosis of ASCVD is likely to have underestimated the percentage with a history of ASCVD.
- The method for measuring statin adherence is also based on a small claims history and is likely to have overestimated the percentage with extended adherence to statin therapy.
- This was an observational study, not a randomized controlled clinical trial. In addition, there was no exploration for systematic differences other than sex and age between statin adherent and non-adherent differences. Important cardiovascular risk population differences between statin adherence and non-adherent individuals may have influenced the statin cardiovascular event protection causal inference found in this analysis.

References

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