Measuring adherence trends among patients taking a 3-hydroxy-3-methylglutaryl-coenzyme-A (HMG-CoA) reductase inhibitor

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BACKGROUND

- Adherence to 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitor medications lowers the risk of major cardiovascular events.

- It is unknown whether there is a relationship between adherence and the number of comorbidities a patient has.

- Center for Medicare and Medicaid Services (CMS) uses adherence to 3-hydroxy-3-methylgluatryl-coenzyme A reductase inhibitors in its STAR Rating system as one measure of health plan performance.

- The Pharmacy Quality Alliance (PQA) defines proportion of days covered (PDC) as "the proportion of days in the measurement period covered by prescription claims for the same medication or another in its therapeutic category"[2], with a PDC of 80 percent or greater reflecting medication adherence.

OBJECTIVE

- To evaluate how the number of comorbidities affect medication adherence measured via the proportion of days covered (PDC).

METHODS

Data Collection
- This quality improvement study involved a retrospective review of SinfoníaRx claims data collected for the entire 2017 calendar year.

- The convenience sample of community pharmacy data included patients taking a 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitor medication.

- De-identified data was provided by SinfoníaRx staff to the researchers. Variables of interest included: age, gender, proportion of days covered, type of 3-hydroxy-3-methylglutaryl-coenzyme A reductase drug, and number of comorbidities.

Data Analysis
- Analysis was conducted to determine the relationship between patients taking a 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitor medication and number of comorbid conditions.

- An analysis of variance (ANOVA) was used to analyze PDC values. Bonferonni post-hoc test measured significance between groups.

- Additional analyses were conducted for adherence based on gender and by type of inhibitor drug, using PDC of greater than 80 percent.

- A t-test and ANOVA were performed to analyze average PDC by gender and type of inhibitor medication taken between the groups, respectively. A Bonferonni post-hoc analysis was performed to measure significance between the groups.
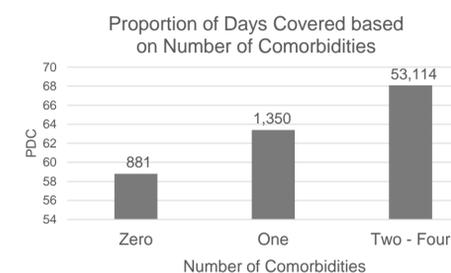
RESULTS

- A total of 55,345 patients were included in the retrospective analysis. The population was predominantly female (56.3%) with an average age of 72.4 years.

- Patients who had more comorbidities were significantly more adherent to their medication compared to patients with fewer comorbid conditions.

- Additionally, significant differences were observed based on gender, with males being slightly more adherent (68.1%) than women (67.6%).

- While the overall ANOVA resulted in significant differences in types of medications taken, the post hoc analysis was insignificant.

Figure 1: Results of analysis of proportion of days covered (PDC) based on patient gender ^

Proportion of Days Covered based on Patient Gender
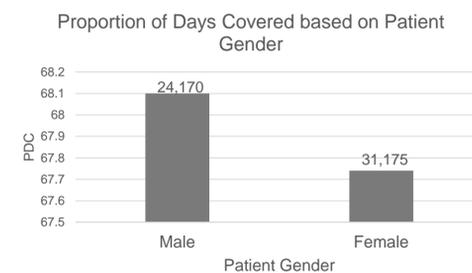
^ Represents significant differences based on gender (p< 0.01)

Figure 2: Results of analysis of proportion of days covered (PDC) based on number of comorbidities ^

Proportion of Days Covered based on Number of Comorbidities

^ Represents significant differences based on number of comorbidities (p< 0.01)

Table 3: Results of analysis of proportion of days covered (PDC) based on type of 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitor medication taken by patient ^

Drug	A	B	C	D	E	F	G	H	I	J	P value
# of Observations	25,011	55	78	6	153	3,286	8,504	6,846	11,372	31.0	
Proportion of Days Covered (PDC) (%)	67.1	72.1	76.4	70.1	66.7	72.2	68.1	66.2	69.1	70.0	< 0.01 ^

Group A: atorvastatin, amlodipine-atorvastatin, **B:** Crestor, **C:** Ezetemibe/simvastatin, **D:** fluvastatin, **E:** Livalo, **F:** lovastatin, **G:** pravastatin, **H:** rosuvastatin, **I:** simvastatin, **J:** Vytorin
^Results of Bonferonni post-hoc test were insignificant.

DISCUSSION

- These study results demonstrate that patients with more comorbidities were more adherent to their 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitor medication

- While the adherence rates for males and females were statistically significant, the difference is less than 2 days per year and likely not clinically significant. Atorvastatin and the ezetimibe/simvastatin combination medications had significantly better adherence when compared individually to the other drugs included in the analysis.

- These findings suggest the need for continued efforts by clinical pharmacists to educate and counsel patients about medication adherence, to ultimately improve patient-related outcomes.

LIMITATIONS

- *The data set included a large sample size, yet represents only a small fraction of patients taking statins in the United States, and thus, is not generalizable to the general public.*

- *The convenience sample of community pharmacy data included predominantly Medicare patients, with some cash claims as well.*

- *The study did not account for level of insurance coverage.*

FUTURE RESEARCH

- Future work is warranted to facilitate designing adherence program materials to help patients with fewer chronic conditions improve adherence to prescribed regimens.

CONCLUSIONS

- This quality improvement study found that patients with fewer chronic conditions were less adherent to their 3-hydroxy-3-methyl-glutaryl-coenzyme A reductase inhibitor medication than those with more chronic conditions.

- However, more research is warranted in more diverse populations and other healthcare settings.

Disclosures

The authors have the following to disclose in regards to possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

Franco Marzella: Nothing to disclose;
Ryan Lowe: Nothing to disclose
Mitchell Welton: Nothing to disclose;
Jennifer Bingham: Nothing to disclose
Kevin Boesen: Nothing to disclose

REFERENCES

- 1. Antman et al. (2004). ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction— Executive Summary | Circulation. [online] Ahajournals.org. Available at: https://www.ahajournals.org/doi/abs/10.1161/01.cir.0000134791.68010.fa [Accessed 11 Sep. 2018].
- 2. Ncpanet.org. (n.d.). Proportion of Days Covered. [online] Available at: http://www.ncpanet.org/pdf/adherence_list.pdf [Accessed 11 Sep. 2018].
- 3. Daugherty, Stacie L., et al. "The Association between Medication Adherence and Treatment Intensification with Blood Pressure Control in Resistant Hypertension." Hypertension, U.S. National Library of Medicine, Aug. 2012, www.ncbi.nlm.nih.gov/pmc/articles/PMC3423913/.
- 4. Xie, Gaoquian, et al. "Six-Month Adherence to Statin Use and Subsequent Risk of Major Adverse Cardiovascular Events (MACE) in Patients Discharged with Acute Coronary Syndromes." Lipids in Health and Disease, vol. 16, no. 155, 15 Aug. 2017, lipidworld-biomedcentral-com.ezproxy2.library.arizona.edu/articles/10.1186/s12944-017-0544-0.