

Letters

RESEARCH LETTER

Cigarette Purchases at Pharmacies by Patients at High Risk of Smoking-Related Illness

Cigarette smoking can make managing chronic diseases more difficult. For instance, in patients with certain respiratory conditions, smoking increases the risk of acute exacerbation, can worsen disease control, and may limit the effectiveness of inhaled corticosteroids.¹ Similarly, by raising blood pressure, smoking can make it challenging to effectively control hypertension and may increase the risk of atherosclerosis and coronary heart disease.² Smoking can also increase the risk of serious adverse drug events. Oral contraceptive (OC) users older than 35 years who smoke have a 9-fold higher risk of myocardial infarction and venous thromboembolism compared with nonsmokers.^{3,4}

A visit to the pharmacy to fill a prescription is, paradoxically, often an opportunity to purchase cigarettes. Using a de-identified database of linked retail pharmacy purchases and prescription data, we estimated the incidence and frequency of cigarette purchases made in retail pharmacies by individuals filling prescriptions for asthma or chronic obstructive pulmonary disease (COPD), hypertension, and OC medications.

Methods | The study population was drawn from a previously defined cohort of 361 114 patients who received pharmacy benefits through Caremark and filled a statin prescription be-

tween January 1, 2011, and June 30, 2012. This cohort included linked data from all purchases at CVS retail locations made with a CVS loyalty card that patients receive as a Caremark benefit and all prescription fills in the year before the patient's first statin prescription.

Within this cohort, we identified individuals who filled a prescription for an antihypertensive, asthma or COPD, or OC medication during the 365-day observation period and set the date of the patient's first prescription fill for a drug of interest as the index date. We identified cigarette purchases after a patient's index date and defined a co-purchase as a day on which an individual purchased cigarettes and had medication available, using a 7-day grace period to allow for modest nonadherence. Oral contraceptive users were restricted to women aged at least 35 years, consistent with US Food and Drug Administration label warnings.⁵ The institutional review board of Brigham and Women's Hospital approved this study.

Results | Of 38 939 patients taking a medication in a class of interest, 6.0% of asthma or COPD medication users, 5.1% of antihypertensive medication users, and 4.8% of OC medication users had at least 1 cigarette co-purchase (**Table**). Across all medication classes, patients with a cigarette co-purchase made an average of twice as many monthly store visits (1.9 vs 0.9 in all patients). Among patients who purchased cigarettes, the median number of store visits with a cigarette purchase was 2; 25% of asthma and COPD medication users had 4 to 53 visits, OC

Table. Store Purchase Characteristics of All Patients and Those Who Purchased Cigarettes

Characteristic	Medication Class		
	Asthma/COPD ^a	Antihypertensive ^b	Oral Contraceptive
All Patients			
Total sample, No.	5033	31 708	2198
Monthly store visits			
Mean (SD)	0.9 (1.2)	0.9 (1.1)	0.9 (1.2)
Median (IQR)	0.5 (0.2-1.3)	0.5 (0.2-1.1)	0.5 (0.2-1.2)
Total store visits, median (IQR)	3 (1-10)	3 (1-9)	3 (1-9)
Patients With ≥1 Cigarette Purchase			
No. (%) of total	303 (6.0)	1604 (5.1)	106 (4.8)
Monthly store visits			
Mean (SD)	1.9 (1.7)	1.8 (1.9)	1.9 (1.8)
Median (IQR)	1.4 (0.7-2.7)	1.2 (0.6-2.4)	1.4 (0.7-2.9)
Monthly store visits with a cigarette purchase			
Mean (SD)	0.5 (0.7)	0.5 (1.0)	0.6 (1.0)
Median (IQR)	0.3 (0.1-0.5)	0.2 (0.1-0.5)	0.2 (0.1-0.5)
Total store visits, median (IQR)	11 (5-23)	11 (5-23)	12 (5-25)
Total store visits with a cigarette purchase, median (IQR)	2 (1-4)	2 (1-4)	2 (1-4)

Abbreviations: COPD, chronic obstructive pulmonary disease; IQR, interquartile range.

^a Inhaled anticholinergics, inhaled corticosteroids, leukotriene modulators, long-acting β -agonists, and adrenergic combinations.

^b Angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, direct renin inhibitors, anti-adrenergic antihypertensives, β -blockers, diuretics, and calcium channel blockers.

users had 4 to 94 visits, and antihypertensive medication users had 4 to 135 visits. Approximately 10% of patients with cigarette purchases were taking medications in 2 or 3 of the classes.

Discussion | Using a novel data source that links retail pharmacy purchase data to prescription dispensing data, we found that 1 in 20 patients who were taking medications in 3 classes purchased cigarettes at the pharmacy. On average, these patients made a cigarette purchase at the pharmacy every other month.

Our analysis is limited by potentially incomplete purchasing information because individuals may not use their loyalty cards for every purchase, and these data do not capture cigarette purchases made at other locations. Some of the cigarette purchases may have been made for or by another household member with whom the patient shares their loyalty card.

Nevertheless, our results highlight an opportunity to improve outcomes for patients receiving widely used treatments. The decision of some pharmacies, including CVS, to stop selling cigarettes has been met with widespread support from public health and medical organizations.⁶ Similar actions by other pharmacies may help prevent cigarette purchasing by individuals at greatest risk.

Alexis A. Krumme, MS
Niteesh K. Choudhry, MD, PhD
William H. Shrank, MD, MSHS
Troyen A. Brennan, MD, JD, MPH
Olga S. Matlin, PhD
Gregory Brill, MS
Joshua J. Gagne, PharmD, ScD

Author Affiliations: Division of Pharmacoepidemiology and Pharmacoeconomics, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts (Krumme, Choudhry, Brill, Gagne); CVS Health, Woonsocket, Rhode Island (Shrank, Brennan, Matlin).

Corresponding Author: Joshua J. Gagne, PharmD, ScD, Division of Pharmacoepidemiology and Pharmacoeconomics, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, 1620 Tremont St, Ste 3030, Boston, MA 02120 (jgagne1@partners.org).

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Study concept and design: Krumme, Choudhry, Brennan, Gagne.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Krumme, Gagne.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Krumme, Brill.

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