The Effect of Medication Samples on Self-Reported Prescribing Practices: A Statewide, Cross-Sectional Survey

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BACKGROUND: The pharmaceutical industry spends billions of dollars annually to encourage clinicians to prescribe their medications. Small studies have demonstrated that one of the marketing strategies, the distribution of free sample medications, is associated with increased use of brand name medication over generic medication.

OBJECTIVES: To determine the relationship between the presence of drug samples in primary care clinics and prescription of preferred drug treatments.

DESIGN: Cross-sectional survey.

PARTICIPANTS: Primary care prescribers in the state of Vermont.

MAIN MEASUREMENT: Prescribers were presented with two clinical vignettes and asked to provide the name of the medication they would prescribe in each case. We compared the responses of prescribers with and without samples in their clinics.

KEY RESULTS: Two hundred six prescribers out of the total population of 631 returned the survey and met the eligibility criteria. Seventy-two percent of prescribers had sample closets in their clinics. Seventy percent of clinicians with samples would prescribe a thiazide diuretic for hypertension compared to 91% in those without samples ($P < 0.01$). For managing depression 91% of prescribers with samples would have provided a generic medication in a patient with no health insurance, compared to 100% of those without samples in their clinic ($P = 0.02$).

CONCLUSIONS: Clinicians with samples in their clinics were less likely to prescribe preferred medications for hypertension and depression.

KEY WORDS: physician behavior; professionalism; drugs; evidence-based medicine.

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INTRODUCTION

The pharmaceutical industry invests heavily to provide sample medications to prescribers. The retail value of medication samples distributed in the United States exceeded \$18 billion in 2005, an amount that has tripled in 10 years.¹ These free medications reach many prescribers and patients. In 2003, 12% of all Americans received a sample medication,² and in 2004, nearly half of all Medicare beneficiaries asked for or received samples.³ Furthermore, 92% of physicians stated that they had received samples from pharmaceutical representatives at least once in their career, according to a national representative survey.⁴

Research suggests that samples result in increased prescribing of brand name medications when more evidence-based, less costly generic or over-the-counter alternatives exist. A survey study, using vignettes to simulate prescribing decisions, found that use of samples led physicians to dispense and write subsequent prescriptions for medications that differed from preferred agents.⁵ This finding has been confirmed in observational research.⁶ Furthermore, observational studies have shown that physicians who provide samples to their patients are less likely to recommend over-the-counter medications,⁷ less likely to prescribe preferred medications^{8,9} and more likely to prescribe advertised medications.⁷

The major limitation of this prior research is generalizability. This work has been confined to the study of individual practices,^{7–9} comparison of practices within a single system^{5,6} or comparing three similar residency clinics with different sample policies.¹⁰ We sought to examine samples and their influence on prescription-writing in a statewide survey of primary care prescribers.

We conducted a statewide cross-sectional survey of primary care prescribing clinicians in Vermont. The survey included questions about the presence of sample medications in clinics, hypothetical vignettes meant to simulate prescribing behavior and questions regarding beliefs about sample medication use. We examined whether prescribers with samples were less likely to indicate that they would prescribe generic and guideline endorsed medications in response to these vignettes.

METHODS

Participants

We mailed surveys to all 631 primary care clinicians practicing in the state of Vermont in September 2007. One month later,

we sent a postcard reminder to those clinicians that had not yet responded. The 631 prospective subjects were identified from the Vermont Area Health Education Center (AHEC) database. This database includes all practicing primary care prescribers in Vermont, their specialty, their discipline (MD/DO, advanced practice registered nurse or physician assistant) and their clinic name and location. The maintenance of an accurate database includes regular communication between the University of Vermont's AHEC program, three regional AHECs, the Vermont Medical Practice Board and the state's primary care clinics.

To be eligible, practitioners had to be either a physician with an MD or DO degree, a nurse practitioner or a physician assistant. The prescriber needed to practice internal medicine, family medicine or general practice. Subjects who did not answer the questions on the survey required for ascertainment of their specialty, degree, use of samples or medication-prescribing practices were excluded. The Institutional Review Board of the University of Vermont designated this project as exempt from review.

Measurement

The survey questions were in three domains: clinician and practice demographics, case vignettes simulating medication prescribing practices and beliefs about sample medication use. With permission, we used several items from a survey developed and validated by Chew et al.⁵ The demographics portion of the survey included questions about age, gender, years since professional degree, specialty, practice size, practice type, presence of medication samples and frequency of sample use. To ascertain sample availability and use, prescribers were asked about whether samples were available at their clinic and whether they provided samples "daily," "weekly," "monthly," "less than monthly" or "never." Practice type refers to whether the prescriber's clinic was for-profit or not-for-profit. Practice size refers to the number of prescribing clinicians in the practice.

The vignettes were taken directly from Chew et al.⁵ and represented two common scenarios in primary care: a patient with hypertension and one with depression. The vignettes detailed the history of two fictitious patients with no health insurance. Both met criteria for management with medication. Clinicians were asked to respond by writing the name of the medication they would prescribe.

Beliefs about the use of samples were solicited by presenting a series of items that included whether samples expedite treatments, prevent pharmacist counseling, help patients who can't afford medications, alter treatment plans, increase cost of care, decrease patient costs, are liked by patients, are generally helpful and are overused by others. The first three belief items from this list were obtained from the survey developed by Chew et al.⁵ The belief items were all collected on a 5-point Likert scale, ranging from "strongly agree" to "strongly disagree."

Analysis

Using the vignettes, we tested the hypothesis that there is a difference in self-reported prescribing practices between prescribers with samples and those without samples. In each

vignette we divided the prescribed medications into two categories: using the preferred treatment or not. For the hypertension case we followed the JNC VII guidelines¹¹ that state that the preferred prescription for this patient was a thiazide diuretic. We accepted combination medications containing thiazide diuretics as following this guideline. For the case of depression the preferred medication is a generic medication; research shows equal efficacy among most antidepressants, and cost would be a significant barrier to adherence in a patient with no insurance.¹² We examined the association between the use of preferred medications and having sample medications available in the office using chi-square analysis.

We then built multivariable regression models to adjust for potential confounders. We examined the data for possible associations between the demographic characteristics and availability of sample medications in the office. We used chi-square analyses for categorical data. We used Student's t-test or Wilcoxon rank sum for continuous data. Any characteristics associated ($P < 0.20$) with the presence of medication samples in the clinic were included in the multivariable logistic regression models. The assumption that the log odds of using a preferred medication had a linear relationship with continuous characteristics was examined using the locally weighted scatter plot smoother technique.¹³ Characteristics that violated this assumption were dichotomized.

Beliefs about sample use were collected on 5-point Likert scales, which we subsequently dichotomized for analysis into "Agree" (strongly agree and agree) versus "Don't agree" (neutral, disagree, strongly disagree). Chi-square analysis was used to compare the proportions of clinicians agreeing with the statements in the two groups. All analyses were two-tailed, $\alpha = 0.05$, and were performed using STATA version 10.0.¹⁴

RESULTS

Thirty-five percent of prescribers returned their surveys. Of the 221 surveys returned, we excluded prescribers who were not practicing primary care (3), who left information blank about whether they practiced primary care (6) or who did not complete the vignettes (7). These exclusions were not mutually exclusive, resulting in a final sample size of 206 for analysis.

Seventy-two percent of prescribers had samples in their clinics. The average age of the subjects was 50.3 with 25th and 75th percentiles of 44 and 57 years, respectively. The characteristics of clinicians both with and without samples are detailed in the Table 1. There were no differences between the two groups of prescribers in regard to age, gender, years since degree or level of training. Though individual prescriber characteristics were not associated with sample availability, characteristics of the practice sites had statistically significant associations. For example, prescribers with samples available tended to work in smaller practices and were more likely to work in a for-profit clinic. We found that 94% of prescribers working in for-profit clinics had samples in their offices, as opposed to only 50% of prescribers the not-for-profit setting.

In response to the clinical vignettes, there were significant differences in the indicated prescriptions between clinicians who had samples in their offices and those who did not. In the hypertension vignette, only 70% of the clinicians with samples in

Table 1. Characteristics of Clinicians with and Without Sample Closets in Their Practices

Characteristic	Sample closet n=148	No closet n=58	P
Demographics			
Age, mean (SD)[range]	50.7 (9.3) [29–78]	49.5 (8.7) [30–66]	0.44
Male gender	79 (53%)	32 (56%)	0.71
Years since degree	20.1 (10.7) [1–53]	21.6 (9.8) [5–40]	0.28
Physician	107 (72%)	48 (83%)	0.12
Midlevel provider	41 (28%)	10 (17%)	
Private for profit practice	76 (52%)	5 (8.9%)	<0.01
Practice size, median [range]	4 [1–17]	8 [1–50]	<0.01
Outcomes			
Thiazide for HTN	103 (70%)	53 (91%)	<0.01
Generic for depression	134 (91%)	58 (100%)	0.02

their clinic indicated they would prescribe a medication containing a thiazide diuretic compared to 91% of clinicians without samples in their clinic ($P<0.01$). A difference was also seen in the depression vignette; all of the clinicians without samples indicated they would prescribe a generic medication compared to 91% of those with samples in their clinic ($P=0.02$).

Multivariable analysis was not possible for the depression vignette since not having samples in the clinic was a perfect predictor of indicating a generic medication prescription. After adjusting for working in a for-profit setting and practice size, clinicians with samples available were less likely to prescribe thiazide diuretics [OR=0.2 (95% CI 0.06–0.68)]. To test the robustness of this conclusion, we built post-hoc models with two additional strategies. The first was a full regression with all demographic factors. This showed that clinicians with samples were still less likely to select a thiazide diuretic [OR=0.15 (95% CI 0.04–0.56)]. None of the other characteristics in this model had a statistically significant association with thiazide use. The second post-hoc regression model used frequency of providing samples as the major predictor instead of merely having samples available at the practice site. Primary care prescribers who dispensed samples at least weekly were less likely to select a thiazide in the vignette than those that dispensed samples less frequently or not at all [OR=0.4 (95% CI 0.18–0.85)].

Prescribers who had samples in their office differed substantially in their beliefs about the use of samples compared to prescribers who did not (Fig. 1). Those with sample medications were more likely to believe that samples are liked by patients, help patients who can't afford their medication, reduce patient costs, expedite treatment and help clinicians assess the efficacy of medications. Prescribers who did not have samples in their clinics were more likely to believe that samples alter treatment plans, increase the cost of care and samples are overused. Interestingly, the majority of clinicians with samples still agree that they alter treatment plans and increase the costs of care.

DISCUSSION

This is the largest scale study to date of the influence of sample medications on prescribing practices. This is also the first study to compare beliefs between prescribers who have

Figure 1. Comparison of attitudes about sample use in prescribers who do and don't have samples in their clinics. * $P<0.01$.

samples to those who do not. In this statewide survey of primary care clinicians, 72% of prescribers had samples in their clinics. Though prior research has shown that 92% of all physicians in the US have received free samples,⁴ our findings of a lower proportion would be expected, since it reflects the current prevalence rather than lifetime prevalence of samples use. We found that prescribers with samples in their clinics were less likely to prescribe generic medications to uninsured patients with depression and less likely to prescribe the preferred antihypertensive according to current guidelines. This influence of samples is consistent with prior research.^{5,6,8,9} We found that compared to clinicians without samples, clinicians with samples in their clinic were more likely to believe that samples are helpful, lower patient costs, help assess the efficacy of new medications and help patients who can't afford their medications. However, the majority from both groups agreed that samples increase the cost of care. Our results are not surprising given prior research findings. In Chew et al.⁵, important factors that contributed to dispensing samples included avoiding patient cost, assessing the efficacy of medications and helping patients who can't afford their medications.

Though many prescribers believe that sample medications offer a financial benefit to patients, mounting research evidence is challenging the belief that samples mainly serve to help patients who can't afford their medications. Our study showed that prescribers who had sample closets were more likely to indicate they would prescribe expensive brand-name medications than generic medications for an uninsured patient with depression. Chew et al.⁵ found that after giving samples of expensive brand-name medications, 69% of physicians would have then provided a prescription for the brand name medication for hypertension. Thus, samples may provide an initial cost savings to uninsured patients who receive them, but may very well create a cost burden for these and all other patients by shifting prescriptions towards more expensive medications. In our study, the majority of both prescriber groups agreed that samples do increase the cost of medical care. Furthermore, research has recently shown that well-

insured patients, who do not need assistance paying for medication, are more likely to receive samples than uninsured patients.²

The strength of this study is that it provides a window into the beliefs and expected behaviors of prescribers across many practice settings throughout an entire state. However, this study has a number of potential limitations. In our study we focused on vignettes where the patient did not have health insurance in order to make cost a significant consideration in choosing a medication. In scenarios where a patient has health insurance coverage for prescriptions, it is more likely that formulary coverage would influence the choice. However, the preferred agents in these vignettes are also some of the least expensive options available to the patient and are likely to be first choices on most insurance formularies.

A potential limitation of our beliefs evaluation is that participants who indicate that they use samples may have determined that our survey was inquiring about samples and subsequently answered questions to support this answer rather than based on their actual beliefs. For example, someone who indicated that they use samples would be more likely to highly rate the value of samples in helping patients on the belief questions. It is difficult within this survey study to determine how much of a role this potential bias is having on the difference between the two groups. Future research that focuses on these beliefs as the primary outcome could strategically organize questions so that sample use was collected late in the survey, after the belief questions were asked, to mitigate the effects of this bias.

Though this study broadens the generalizability of prior research by sampling an entire state, Vermont is a small, rural state, and these findings may not be generalizable to states with different population sizes and distributions. A limitation of all survey research is that those who did not return the survey may have beliefs and behaviors that differ from those that responded. It is reassuring that our results are similar with prior research despite this limitation.

With the growing body of evidence that samples have a negative impact on both evidence-based practice and cost of medical care, a number of solutions have been proposed: removing samples from clinics, stocking generic samples, vouchers for generic medications and sample formularies. Proponents of removing samples from clinics believe that the harmful effects outweigh any potential benefits. Research has shown that this latter approach is effective at encouraging wise prescribing.^{7,9,10} Providing prescribers with samples of generic medications would give prescribers an alternative to a more expensive sample medications. Research on this strategy is ongoing, and appears promising.^{15–18} A similar strategy to stocking generic samples is offering vouchers for generic medications that a prescriber could provide to the patient in lieu of a sample.¹⁹ This would potentially offer the same benefits as a generic sample, but without the administrative issues of restocking, managing inventory, etc. This approach has not been studied. Sample formularies are also a novel strategy that has not been studied.²⁰ This intervention, aimed at the practice level, encourages clinicians to proactively decide which sample medications are best supported by the literature. Clinicians would then follow this formulary plan when providing samples, discarding or disregarding all other samples offered to them. Our work and that of Chew et al. have shown there is a strong belief that samples help patients who can't afford their medications. This would suggest these prescribers would be more open

to vouchers, generic samples and formularies as a long-term plan to mitigating the harmful effects of samples as opposed to eliminating samples altogether. There is a large need for research on these interventions to better establish their effectiveness in promoting cost-effective, evidence-based prescribing as well as impact on prescriber and patient satisfaction.

CONCLUSION

The majority of clinicians have samples in their offices. Clinicians with samples in their clinics were less likely to prescribe preferred medications for hypertension and depression. Their choices were more costly and less guideline-based than their colleagues. As administrators, policy makers and clinicians contemplate how to mitigate the negative effects of samples, consideration of strongly held beliefs, such as how samples help patients who can't afford their medication, may be important in developing a successful strategy.

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