Association of Quetiapine Overuse Letters With Prescribing by Physician Peers of Targeted Recipients: A Secondary Analysis of a Randomized Clinical Trial

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Physicians learn about new medical evidence from their peers.[1,2] Interventions that can stem overuse in some physicians could therefore spur system-wide change through peer networks as physicians discuss new practice styles and learn from each other. One persistent source of overuse is antipsychotic prescribing: these drugs are widely prescribed to people with dementia even though guidelines discourage this practice.[3] A randomized trial of antipsychotic overuse letters, sent by the Centers for Medicare and Medicaid Services (CMS) to high prescribers of quetiapine, reduced prescribing by targeted physicians by 16% over two years.[4] This study examines whether these letters led to changes in prescribing by peers of the original physicians, which would suggest that overuse interventions can have broader effects.

METHODS

During April-August 2015, high-volume primary care physician (PCP) prescribers ("study PCPs") of quetiapine (N=5,055) were randomized to receive a series of three letters mailed from CMS about their prescribing (treatment), or a pair of letters about an unrelated Medicare regulation (control). Treatment letters compared the PCP's quetiapine prescribing to other PCPs and stated that they were under review by CMS.

We analyzed effects on peers who prescribed quetiapine in 2014 and worked with original study PCPs. Peers were identified as other practitioners in study PCPs' group practices or other practitioners who treated ≥11 patients in common with any study PCP (with each patient treated by both practitioners within 30 days). Peers linked to at least one study PCP in the original treatment group were considered treated while the remainder were controls.

The pre-specified primary outcome was quetiapine months supplied in 2015-2016, analyzed using multivariable linear regression with randomization-based inference to account for correlation of outcomes within peer networks. We adjusted for peers' number of ties to original

study PCPs because this determined the probability of being treated through peer networks.[5] After adjustment, given randomization of the original intervention, whether a peer worked with a treated or control PCP was random. The IRBs of Columbia University and the National Bureau of Economic Research approved this study and waived informed consent.

RESULTS

There were *N*=7,563 peer practitioners who shared a group practice with original study PCPs (*N*=8,989 who shared patients). 73.8% of group practice peers were PCPs and 8.4% had psychiatric specialization (66.1% and 7.4%, respectively, for shared patient peers). The average group practice peer was linked to 1.4 original study PCPs and 0.7 treated original study PCPs (1.3 and 0.7 PCPs, respectively, for shared patient peers).

Although the intervention caused a large drop in prescribing by original study PCPs (33.6 months supplied [95% CI 27.0 to 40.2, *P*<0.001] or 12.9% relative decrease), we failed to detect a significant effect on peer practitioners (Figures 1 and 2). For group practice peers, adjusted quetiapine prescribing was 2.2 months lower (95% CI 5.5 lower to 1.1 higher, *P*=0.20) or 2.2% for treated vs. control. For shared patient peers, prescribing was 1.3 months lower (95% CI 5.6 lower to 3.0 higher, *P*=0.55) or 1.0%. We failed to detect effects on all other pre-specified antipsychotic prescribing outcomes, including prescribing of all antipsychotics.

DISCUSSION

A series of letters targeting high quetiapine prescribers created a strong push for recipients to reduce quetiapine prescribing. Yet by multiple measures, we did not detect a significant change in prescribing among physicians working with letter recipients. This raises the question of whether other interventions that tend to deliver smaller effects on targeted

practitioners, like simple "nudge" messages, can spill over to other practitioners through peer networks.

Limitations of this study include that peers are measured imperfectly in administrative data and that peer effects could have been meaningful but too small to be detected. These results may not generalize to other interventions which could be more socially acceptable to share.

Given limited effects of these overuse letters on peers and the potential for alert fatigue, practitioners hoping to use similar messages to influence overuse should "choose wisely" as they consider which quality metrics to target.

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REFERENCES

1. Donohue JM, Guclu H, Gellad WF, et al. Influence of peer networks on physician adoption of new drugs. Bekelis K, ed. *PLOS ONE*. 2018;13(10):e0204826. doi:10.1371/journal.pone.0204826

2. Agha L, Molitor D. The Local Influence of Pioneer Investigators on Technology Adoption: Evidence from New Cancer Drugs. *The Review of Economics and Statistics*. 2018;100(1):29-44. doi:10.1162/REST_a_00670

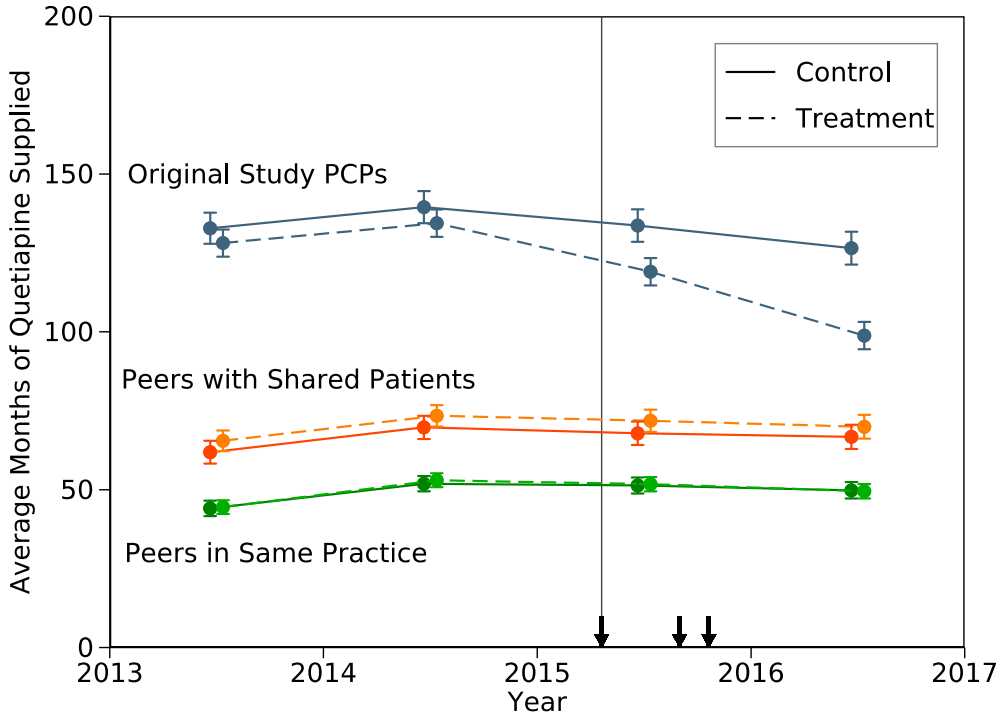
3. American Geriatrics Society. American Geriatrics Society 2015 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. *Journal of the American Geriatrics Society*. 2015;63(11):2227-2246. doi:10.1111/jgs.13702

4. Sacarny A, Barnett ML, Le J, Tetkoski F, Yokum D, Agrawal S. Peer Comparison Letters for High Volume Primary Care Prescribers of Quetiapine in Older and Disabled Adults: A Randomized Clinical Trial. *JAMA Psychiatry*. 2018;75(10):1003-1011. doi:10.1001/jamapsychiatry.2018.1867

5. Sacarny A, Olenski AR, Barnett ML. Spillovers Within and Between Physicians: Evidence from a Randomized Overprescribing Letter in Medicare. AEA RCT Registry. https://www.socialscienceregistry.org/trials/3209. Published December 28, 2018.

FIGURE LIST

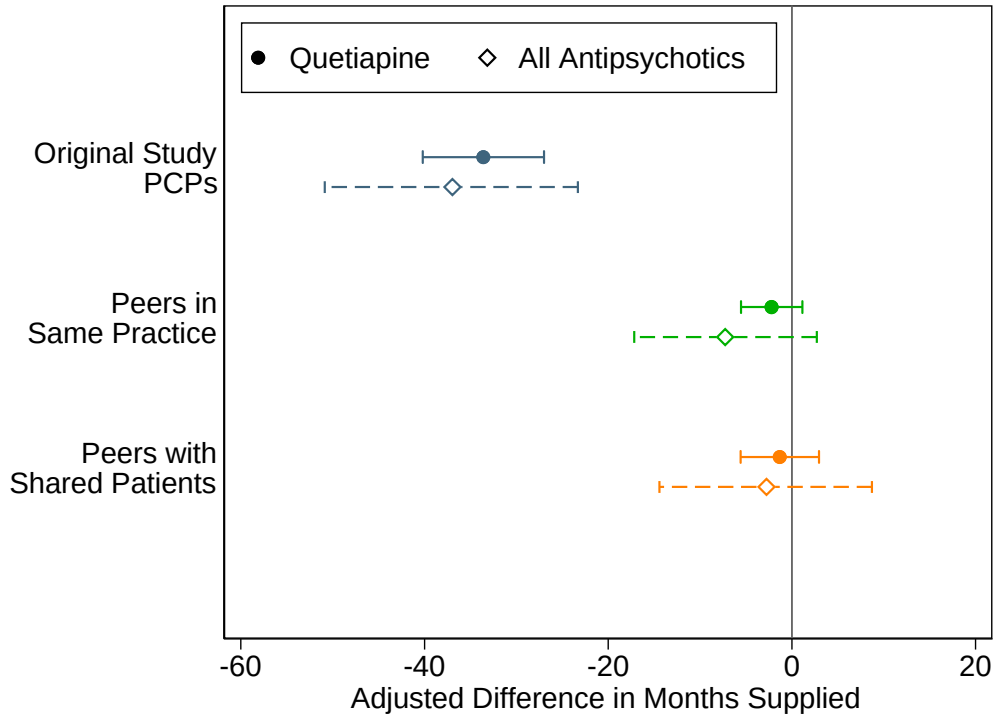
Figure 1



Annual Average Quetiapine Prescribing by Original Study PCPs and Peers in Treatment and Control Groups

Each point represents the average months of quetiapine supplied in each year per prescriber. Because peers linked to more original study PCPs are more likely to be considered treated, averages for treatment and control groups are inverse probability of treatment weighted using the number of original study PCPs with whom peers were associated. Error bars indicate simple 95% CIs. See estimates in Figure 2 for error bars that account for correlation across peers. Vertical line denotes intervention start date and arrowheads denote when treatment letters were sent to prescribers.

Figure 2



Effect of Intervention on Antipsychotic Prescribing by Original Study PCPs and Peers During 2015-2016

Points show the difference in average months of antipsychotics supplied between treatment and control PCPs in the original study, and between treatment and control peers of original study PCPs, during 2015-2016. Each point reports an adjusted difference (difference between treatment and control means, after adjustment for control variables). All estimates adjusted for months of antipsychotics supplied in 2014 to raise statistical power. Because peers linked to more original study PCPs are more likely to be considered treated, peer estimates adjust for the number of original study PCPs with whom peers were associated (indicators for each value are included in the regression model). Error bars are 95% CIs and use randomization inference to account for correlation across peers due to the network structure of treatment.