Variability of Retail Pricing of Generic Urologic Medications in a Major US Metropolitan Area

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OBJECTIVE To investigate retail pricing for generic urologic medications in the St. Louis area as a function of pharmacy type, zip-code, and median income.

MATERIALS AND METHODS Pharmacies spanning 51 zip-codes were identified. From May-June 2017, pharmacies were inquired regarding cost, without insurance, for 30- and 90-tablet prices for finasteride 5 mg, tamsulosin 0.4 mg, oxybutynin 5 mg, and oxybutynin extended release (ER) 5 mg and 10 mg. Median income was determined using US census data.

K-means clustering defined groupings based on zip-code, median income, and a combination of the two. Pricing between groups and pharmacy type was compared using Kruskal-Wallis and Wilcoxon rank-sum tests. Associations between pricing and median income were tested using Spearman's rho.

RESULTS 152 chain and 16 independent pharmacies provided data. Retail pricing for generic urologic medications did not vary as a function of zip-code, median income, or a combination of the two. There was a significant difference in the pricing of tamsulosin 0.4 mg, and oxybutynin ER 5 mg and 10 mg based on pharmacy type, where independent pharmacies have significantly lower prices compared to chain (P = .00-.00003).

CONCLUSION Pricing for generic urologic medications demonstrated wide variability at the retail pharmacy level. Compared to chain, independent pharmacies have significantly lower pricing for tamsulosin 0.4 mg, and oxybutynin ER 5 mg and 10 mg. Pharmacy zip-code, median income, and a combination of the two did not correlate with pricing. UROLOGY 125: 29–33, 2019. © 2018 Elsevier Inc.

Pricing for generic medications has increased substantially over the last decade. From 2011 to 2015, there was an 8.8% rise in number of generic medication prescriptions, and annual spending on generic medication disproportionately increased by 29.4% from $328.3 billion to $424.8 billion USD.[1] Existing literature has indicated that generic pricing increases are partly driven by decreases in numbers of manufacturers of generic medication.[2] However, what is largely unknown is how these rises in cost translate to patients at the retail pharmacy level. Specifically, there is concern whether retail pharmacies increase their generic medication pricing uniformly. For instance, uninsured or underinsured patients could be particularly vulnerable to any inequitable pricing practices, as they may be limited geographically to only a few retail pharmacies. Several studies previously demonstrated that there is wide variability of generic medication pricing based on pharmacy zip code for medications for chronic medical conditions.[3,4] There are, however, no studies examining the variability of generic urologic medications at the retail pharmacy level. Therefore, we investigated retail pharmacy pricing for generic urologic medications in the Saint Louis metropolitan area as a function of pharmacy type, zip code geography, and zip code median annual income.

MATERIALS AND METHODS

Pharmacies spanning 51 zip codes across a 2-state area were identified using a state government provided list.[5] During a 4-week period in May-June 2017, these pharmacies were contacted via telephone to inquire cost using a script, without insurance, for 30- and 90-tablet prices for the following medications: finasteride 5 mg, tamsulosin 0.4 mg, oxybutynin 5 mg, and oxybutynin ER 5 mg and 10 mg. These generic medications were selected based on AUA guidelines for medical management of chronic urologic conditions. Zip code median income was determined using US census data.

K-means clustering was used to define groupings based on zip code geography (latitude and longitude), zip code median

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income, and combined zip code geography and income. Pricing of generic urologic medications between clusters and between pharmacy type was compared using Kruskal-Wallis and Wilcoxon rank-sum tests, respectively, for each medication and quantity. Associations between pricing and zip code median income were tested using Spearman's rho for each medication and quantity. Two-sided *P* values were utilized when applicable, and *P* values < .05/50 are considered significant according to the Bonferroni correction. All analyses were performed using R-software version 3.3.2.

RESULTS

Out of 175 identified pharmacies within the 51 zip codes spanning the 2-state area, 168 (96%) pharmacies provided data, of which 152 were chain pharmacies and 16 were independent pharmacies (Fig. 1). The 7 remaining pharmacies did not provide data for the following reasons: pharmacy permanently closed (n = 4), pharmacy disagreed to disclose prices after 4 separate attempts on different days (n = 3). The number of medication manufacturers varied: finasteride, 8; tamsulosin, 6; oxybutynin, 6; oxybutynin ER, 7. Median annual income spanning the 51 zip codes was $48,884.87 (range: $10,491-$112,017). Pricing for all medications did not correlate significantly with pharmacy zip code median income, with rho ranging from −0.078 (*P* = .31) to 0.109 (*P* = .16). 10 unique chain pharmacy brands were identified, 9 of which had more than one store included, and pricing was consistent across all stores for only 1 of these 9 chains.

Price ranges for generic urologic medications were wide (Table 1). There was a significant difference in the pricing of tamsulosin 0.4 mg, and oxybutynin ER 5 mg and 10 mg based on pharmacy type for both 30- and 90-tab supplies, where independent pharmacies have significantly lower prices compared to chain pharmacies (*P* < .001) (Table 1). There was no significant difference in pricing of the remaining medications based on pharmacy type (*P* = .15-.73).

Four clusters of pharmacies were identified for comparison based on zip-code median annual income, corresponding to

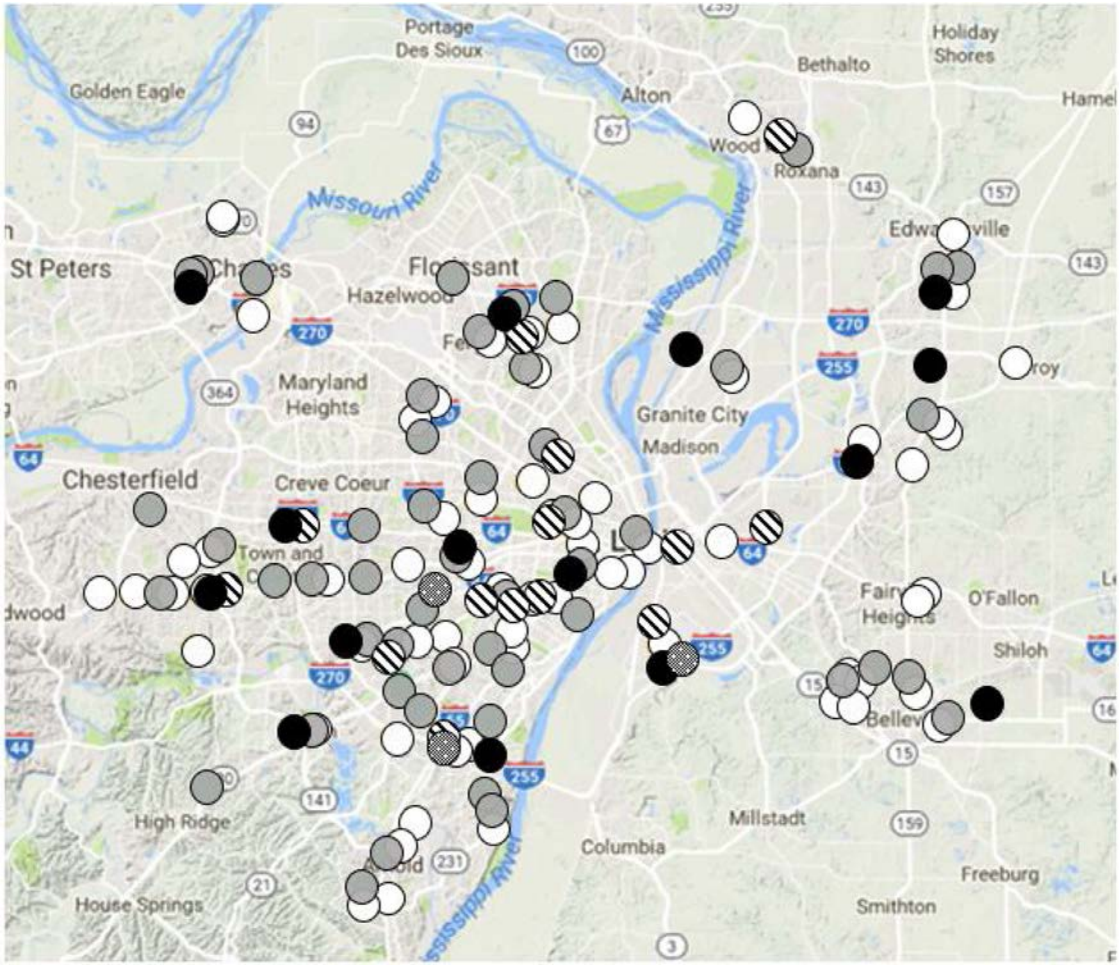

Figure 1. Pharmacy locations and pricing for 30-tab supply of tamsulosin 0.4 mg.
- Diagonal Line Pattern Circle ≤ $20
- Grey Circle = $21-50
- Black Circle = $51-70
- White Circle = $71-100
- Dotted Pattern Circle ≥ $101.

(Color version available online.)

Table 1. Generic urologic medication pricing based on pharmacy type

Quantity	Drug / Pharmacy Type	Finasteride 5 mg C	Finasteride 5 mg I	Tamsulosin 0.4 mg C	Tamsulosin 0.4 mg I	Oxybutynin 5 mg C	Oxybutynin 5 mg I	Oxybutynin ER 5 mg C	Oxybutynin ER 5 mg I	Oxybutynin ER 10 mg C	Oxybutynin ER 10 mg I
30-tab	Median:	65.49	15.87	66.11	15.25	21.49	20.50	106.99	38.19	94.99	35.48
	Range:	[4.00-95.00]	[5.00-100.78]	[8.00-123.69]	[10.00-133.00]	[7.55-55.49]	[13.7-37.50]	[15.00-211.99]	[25.00-99.00]	[15.00-183.19]	[25.00-99.00]
	P value:	0.417		0.000		0.722		0.000		0.000	
90-tab	Median:	66.11	15.25	183.52	36.00	55.99	55.66	308.89	94.65	284.89	94.70
	Range:	[10.00-280.00]	[12.00-288.34]	[21.00-369.89]	[24.50-386.00]	[22.67-155.59]	[41.00-90.00]	[45.00-602.85]	[65.00-283.55]	[45.00-548.49]	[65.00-283.84]
	P value:	0.152		0.000		0.734		0.000		0.000	

C, chain; I, independent.

very-high income (n = 24, $94.317), high income (n = 19, $71,734), moderate income (n = 64, $55,333), and low income (n = 61, $31,485). Pricing was not significantly different across the income clusters (*P* = .37-.89). In addition, six geographic clusters were identified (Fig. 2), and pricing was not significantly different across the geographic clusters (*P* = .19-.97). And finally, six combined income-geography clusters were identified (Fig. 2), and pricing also was not significantly different across the clusters for all medications (*P* = .49-.92).

DISCUSSION

Our study indicates that, in a large sample of a U.S. metropolitan area, retail pharmacies do not appear to modify their pricing of generic urologic medications based on geographic location, zip code median annual income, or a combination of the two. There was, however, significant variation in price for all medications. For instance, 30-tab pricing for Finasteride 5 mg ranged from $4.00 to $100.78. Even within the same zip code, pricing often varied dramatically, suggesting that if a patient is limited geographically, it is still possible to realize significant cost savings. This variability in pricing of generic medications does not appear to be isolated to urologic medications or to the St. Louis metropolitan area. In fact, previous studies examining pricing of nonurologic generic medications in several different locations also reveal significant variability.[6-8] Multiple factors could be contributing to this variability, including pharmacy sales volume, retail pharmacy discretion, reimbursement levels, or product costs; we were unable to assess these factors, as they are proprietary. However, we pose that pharmacies are able to price to a high degree of variability because, much like other arenas of health care, patients culturally do not seem to "shop-around" for medications and pricing is often not transparent.[6] Mail-order pharmacy is an alternate way of obtaining medications for chronic diseases. These are generally thought to be cheaper than retail pharmacies and patients are encouraged to utilize. But in reality, while mail-order pharmacies provide lower total prescription costs and third-party payers' costs, they have been noted to have higher patient costs. And interestingly mail-order pharmacies provide lower process for branded products.[9] Furthermore, providers frequently send prescriptions electronically to a patient's preferred pharmacy for convenience, discouraging the option to "shop-around." Hence the pharmacies can potentially use this feature to their advantage. On the other hand, the providers are encouraged to use EHR for prescribing medications, assuming it helps keep costs at minimum. Unfortunately this practice may not contribute in overall health care costs reduction, if pharmacies have an opportunity to exploit this convenience feature, to a financial benefit.

While it is a common belief that chain pharmacies provide universally lower prices due to purchasing power, our

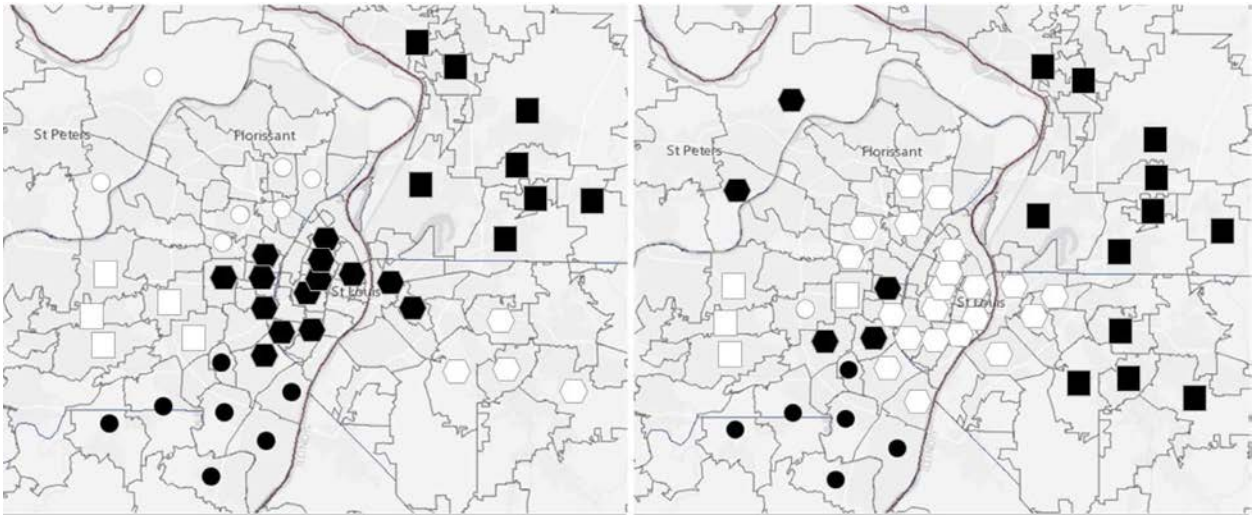

Figure 2. Cluster analysis based on geography (left) and geography + income (right).
Left
- Black Hexagon = Cluster 1, representing 20 zip codes and 50 pharmacies.
- White Hexagon = Cluster 2, representing 4 zip codes and 16 pharmacies.
- White Square = Cluster 3, representing 5 zip codes and 27 pharmacies.
- Black Square = Cluster 4, representing 8 zip codes and 22 pharmacies.
- Black Dot = Cluster 5, representing 7 zip codes and 29 pharmacies.
- White Dot = Cluster 6, representing 7 zip codes and 24 pharmacies.

Right
- Black Hexagon = Cluster 1, representing 5 zip codes and 20 pharmacies.
- White Hexagon = Cluster 2, representing 23 zip codes and 60 pharmacies.
- White Square = Cluster 3, representing 4 zip codes and 19 pharmacies.
- Black Square = Cluster 4, representing 12 zip codes and 38 pharmacies.
- Black Dot = Cluster 5, representing 6 zip codes and 26 pharmacies.
- White Dot = Cluster 6, representing 1 zip code and 5 pharmacies.

(Color version available online.)

findings suggest significant medication cost savings with independent pharmacies. Specifically, we found that independent pharmacies were significantly cheaper for tamsulosin 0.4 mg and oxybutynin (5 mg and 10 mg) when compared to chain pharmacy pricing. This finding aligns with a study by Arora et al who surveyed 528 pharmacies in the Los Angeles metropolitan area and found that independent pharmacies were also significantly cheaper than chain for generic antibiotics levofloxacin and azithromycin.[8] Here, the medications examined are for treatment of pneumonia, and therefore the medications were indicated for short-term use. Conversely the current study examines pricing of medications used for chronic urologic problems. Additionally, the study by Arora et al represents a larger metropolitan area compared to St. Louis, with demographic, health and socio-economic variations between the two cities at baseline. Our present study has a better representation of the general US population.

Independent pharmacies may be able to offer competitive pricing for generic medications due to increased flexibility and pharmacist discretion, while large chains may inflate retail prices to increase insurance reimbursement.[10,11] In addition high volume and prevalence of a particular disease may allow capital firms and/or pharmacies to manipulate the higher prices to their favor, increasing the cost burden on the patient, irrespective of geographic location or income. For these reasons, we assert that providers and patients consider independent pharmacies when "shopping-around" for generic urologic medications.

Our study has several limitations. Most apparently, we limited our study to 4 medications and to the St. Louis metropolitan area. Our findings therefore may not apply to all guideline-indicated generics for chronic urologic conditions, and although St. Louis represents a wide range of demographics, our study may not represent all locations. The other limitation of the study is that mail order pharmacies prices were not determined. Mail order pharmacies can be utilized for chronic prescriptions and may represent a larger fraction of prescriptions. Furthermore, we did not specifically inquire for discounted prices or available coupons from pharmacies, which are often available either free-of-charge or through a membership program. While these available discounts were, for the majority of our inquisitions, not offered or advertised voluntarily, it is possible that the extent of variability seen in our study may be inflated.

CONCLUSION

To our knowledge, this is the only study examining retail pharmacy pricing practices for generic urologic medications. Our findings indicate that while pharmacies do not price based on zip code median income, geography, or a combination of the two, there is extreme variability in price, even within the same zip code. This marked price variation suggests that patients may benefit from both urologist-directed encouragements to "shop-around," perhaps at an independent pharmacy, and increased pricing transparency from a policy-making standpoint.

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References

1. Aitken M, Kleinrock M, Pennente K. *Medicines Use and Spending in the U.S: A Review of 2015 and Outlook to 2020, I.I.H.F. Informatics*. IMS Health Incorporated; 2016. Editor.
2. Dave CV, Kesselheim AS, Fox ER, Qiu P, Hartzema A. High generic drug prices and market competition: a retrospective cohort study. *Ann Internal Med*. 2017;167:145–151.
3. Erickson SR, Lin YN. Geospatial analysis of statin adherence using pharmacy claims data in the state of Michigan. *J Manage Care Spec Pharma*. 2014;20:1208–1215.
4. Hauptman PJ, Goff ZD. Variability in retail pricing of generic drugs for heart failure. *JAMA Internal Med*. 2017;177:126–128.
5. *Pharmacy downloadable listings*. [cited 2017; Available from: http://pr.mo.gov/listings-pha.asp.
6. Kullgren JT, Segel JE, Peterson TA, Fendrick AM, Singh S. Availability and variation of publicly reported prescription drug prices. *Am J Manage Care*. 2017;23:444–448.
7. Alghanem N, Abokwidir M, Fleischer AB, Feldman SR, Alghanem W. Variation in cash price of the generic medications most prescribed by dermatologists in pharmacies across the United States. *J Dermatol Treat*. 2017;28:119–128.
8. Arora S, Sood N, Terp S, Joyce G. The price may not be right: the value of comparison shopping for prescription drugs. *Am J Manage Care*. 2017;23:410–415.
9. Carroll NV. A comparison of costs of Medicare Part D prescriptions dispensed at retail and mail order pharmacies. *J Manage Care Spec Pharm*. 2014;20:959–967.
10. Blank C. Do chains or independent pharmacies offer the best generic pricing?; 2016. [cited 2017 December 15]; Available from: http://drugtopics.modernmedicine.com/drug-topics/news/do-chains-or-independent-pharmacies-offer-best-generic-pricing?page=0,1.
11. Mukherjee S. STUDY: CVS, rite aid, and other chain pharmacies sell generic drugs at up to 18 times their cost; 2013. [cited 2017 December 15]; Available from: https://thinkprogress.org/study-cvs-rite-aid-and-other-chain-pharmacies-sell-generic-drugs-at-up-to-18-times-their-cost-7f4182a854bf/.

EDITORIAL COMMENT

Once again it appears that some members of the medical community, this time retail pharmacies, are taking advantage of patients through opaque pricing. The authors uncovered and documented dramatic differences in 30- and 90-tablet prices in St. Louis for four generic medications commonly prescribed for lower urinary tract symptoms. It is a damning indictment that the cost at the register without insurance for these medications varies anywhere from three-threefold to as much as 30-fold.

Perhaps it is not surprising that the prime offenders of excess pricing were large chain pharmacies. The finding seems counter to the usual teaching that purchasing power leads to cost savings that then get passed on to the customer. The bright spot in this study is finding small independent pharmacies with their connection to community more likely to pass on savings. The authors also convincingly demonstrated that pricing variation was not correlated with geographic income variation.

Importantly, the authors did suggest that our increasing reliance on e-prescribing may actually be undercutting the ability of patients to price compare before purchasing. Hopefully as prescribers we are not unwitting participants in this erosion of consumer protection. At the very least, it seems we need to understand that what appears to be a problem in St. Louis may in fact be a problem in our own home towns.

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