

Price Variation in Proton Pump Inhibitors

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ABSTRACT

Objective: To assess price variation among commonly prescribed proton pump inhibitors used to treat laryngopharyngeal reflux

Methods: 150 pharmacies across Philadelphia and Dauphin Counties were randomly selected and contacted via phone to obtain the full, out-of-pocket price for a 30-day prescription of each of 7 commonly prescribed PPI used in the treatment of LPR.

Mean, median, range, minimum and maximum prices for each drug were calculated and analyzed. Secondly, contributing factors were examined, including: i) generic vs trade, ii) urban vs rural location, iii) chain vs non-chain pharmacy.

Results: Data was collected from 121 pharmacies. The mean, minimum and maximum price are noted respectively for each individual Proton Pump Inhibitor (dollar amounts rounded):

Omeprazole (\$92; \$2; \$269); Prilosec (\$402; \$177; \$462); Esomeprazole (\$200; \$32; \$322); Nexium (\$291; \$16; \$386); Dexilant (\$294; \$93; \$576). Mean prices were found to differ significantly depending on area for the following PPIs:

Omeprazole (\$70 urban vs \$117 rural, $p = 0.0005$); Prilosec (\$420 urban vs \$389 rural, $p = 0.001$).

Significant price differences were noted between chain and non-chain pharmacies: Omeprazole (\$143 chain vs \$25 non-chain, $p = 2.13E-27$); Esomeprazole (\$236 chain vs \$146 non-chain $p = 4.24E-11$); Nexium (\$308 chain vs \$267 non-chain, $p = 0.00058$); Dexilant (\$313 chain vs \$270 non-chain, $p = 0.000036$).

Conclusion: There is significant variability among PPI prices across different pharmacies. Factors that appeared to significantly affect the price were: trade vs generic, urban vs rural and chain vs non-chain pharmacy..

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INTRODUCTION

Proton pump inhibitors (PPIs) are among the most commonly prescribed drugs in the United States, and frequently employed by Otolaryngologists in the pharmacological management of laryngopharyngeal reflux (LPR). In the majority of cases, high dose PPIs are used to help control the retrograde flow of gastric contents into the aerodigestive tract, in order to prevent severe laryngeal damage.^{1,2}

Nationally representative data from the National Health and Nutrition Examination Survey (NHANES) supports an upward trend in prescribing of PPIs across specialties; data on prescription drugs used within the last 30 days demonstrates an increase in PPI and H2 antagonist use from 5.3% to 8.2% from 2002 - 2012.³

Paying out-of-pocket prices for drugs including PPIs pose a burdensome economic cost to patients, and may affect patient adherence and outcomes.

To our knowledge, price variations between different PPIs, and among the same PPI have yet to be discussed in the literature. To address this gap, the purpose of this study was to explore the variation in price in 5 common PPIs used in the treatment of LPR.

Our secondary objective was to analyze whether factors such as generic vs brand formulation, geographical (urban vs rural) or whether purchasing at chain pharmacies significantly affected the price variation.

METHODS AND MATERIALS

This cross-sectional study assessed the prices of 5 commonly prescribed PPIs used in the treatment of LPR, across pharmacies in Philadelphia and Dauphin Counties in Pennsylvania. 150 pharmacies were randomly selected from the Pennsylvania Department of State Online License Verification search engine.

The full, cash price of a prescription for one month's supply (30 tablets) for each of the following PPIs, was obtained from each pharmacy:

- Omeprazole - 40mg
- Prilosec - 40mg
- Esomeprazole - 40 mg
- Nexium 40 mg
- Dexilant - 30mg

Mean, minimum, maximum, median, mode, and standard deviation were obtained for each PPI. For univariate analysis, a two-tailed unpaired Student's t-test was performed. Statistical analysis was performed using commercially available software (Excel 2015, Microsoft, Redmond, WA). A-priori Bonferroni correction factor was applied (0.05 / 12 t-tests), and a p value < 0.004 was set as a cut-off for significance.

Pharmacies were identified as being part of a "large chain" if they were any of the following: CVS, Giant Food, Giant Eagle Shop Rite, Walmart, K-Mart, Target, Rite-Aid.

RESULTS

Data was collected from phone calls to 121 pharmacies. 57 (47.1%) pharmacies were located in Dauphin county, and 64 (52.8%) pharmacies were located in Philadelphia county. 29 pharmacies were excluded as they could not be reached, were health centers, or compound pharmacies.

The mean, minimum, and maximum prices are noted for each PPI (**Table 1**).

Mean prices were found to differ significantly depending on area for the following PPIs (**Table 2**).

Significant price differences were noted between chain and non-chain pharmacies (**Table 3**).

Table 1. PPI Cost

Drug	Mean	Min	Max	STD	N
Omeprazole 40mg	\$92.48	\$2.00	\$269.41	\$75.51	121
Prilosec 40mg	\$401.52	\$177.20	\$461.99	\$45.75	71
Esomeprazole 40mg	\$199.70	\$31.50	\$321.99	\$69.31	116
Nexium 40 mg	\$291.46	\$16.00	\$386.09	\$51.47	113
Dexilant 40mg	\$294.80	\$92.92	\$575.64	\$48.23	118

Note: prices are for 30 tablets

Table 2. Comparison of Prices in Philadelphia and Dauphin Counties

Drug	Philadelphia (urban)	Dauphin (rural)	P-value
Omeprazole 40mg	\$70.23	\$117.46	0.0005*
Prilosec 40mg	\$420.71	\$389.87	0.001*
Esomeprazole 40mg	\$184.37	\$215.56	NS
Nexium 40 mg	\$283.20	\$299.58	NS
Dexilant 40mg	\$290.30	\$299.62	NS

NS = Non Significant, * Significant $p < 0.004$

Table 3. Comparison between chain and non-chain stores

Drug	Chain Store	Non-Chain	P-value
Omeprazole 40mg	143.23	25.40	2.13E-27
Prilosec 40mg	409.55	269.50	NS
Esomeprazole 40mg	236.35	\$146.46	4.24E-11
Nexium 40 mg	307.52	267.33	0.0006
Dexilant 40mg	312.77	270.11	0.00004

NS = Non Significant, * Significant $p < 0.004$

DISCUSSION

This study is the first attempt, to our knowledge, to examine the variability within out-of-pocket prescription costs for PPIs at the consumer level, and seek to identify contributing factors.

The analysis of prescription PPI prices in Pennsylvania shows significant price variation between chain and non-chain stores, with the most notable difference being omeprazole, which cost \$25.40 in a non-chain store compared to \$143.23 in a chain store, a difference of more than 500%. Additionally, there was also a significant difference noted between prices recorded in Dauphin county when compared to Philadelphia County.

This variation in prescription PPI prices is important to the uninsured, who as of 2016 consist of 8.9% of the population, or 28.4 million individuals, with more than half consisting of those in low income populations.⁴ An uninsured resident of Pennsylvania would have drastically variable out of pocket expenses based on the pharmacy that they go to, as well as based on the PPI they are prescribed. Furthermore, low-income patients are already at a high risk of cost-related non-adherence to prescription medications, with more than one-third (34%) of low-income Americans reporting non-compliance because of cost.⁵ Therefore, it is important for the physician to be aware of pricing variations, so that they may address non-adherence and cost related issues.

CONCLUSIONS

There is significant variability among PPI prices across different pharmacies. Factors that appeared to significantly affect the price were: trade vs generic, urban vs rural and chain vs non-chain pharmacies.

This price variation has implications in an uninsured patient's access to care. Therefore, it is paramount that a clinician be aware of pricing variations to ensure that patients not be charged more than necessary for their medication.

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