Increased topical generic prices by manufacturers

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Background: There is limited data regarding generic medication prices. Recent studies have shown price changes at the retail level, but much is not known about the pharmaceutical supply chain or price changes at the manufacturer level.

Objective: We sought to examine the extent of price changes for topical generic medications.

Methods: A comprehensive review of average wholesale prices (AWPs) and manufacturers of topical generics and available corresponding branded medications was conducted for 2005 and 2016.

Results: A total of 51 topical chemical entities were examined. Between 2005 and 2016, the AWP of topical generic medications increased by 273% and the AWP of topical branded medications increased by 379%. The topical generic with the greatest price change increased by 2529%. Eight of the top 20 topical generic medications with the greatest increases in AWP also had an increase in the number of manufacturers.

Limitations: These findings are not generalizable to medications used in other areas of medicine.

Conclusion: Topical generic prices are rapidly increasing at the manufacturer level. (J Am Acad Dermatol 2019;80:1353-7.)

Key words: dermatology; drug prices; generic medications; pharmaceutical supply chain.

Generic medications are vital to the American health care industry. While 88% of all prescriptions are filled by generics, they only account for 28% of drug costs. Between 2005 and 2014, generics have produced more than a trillion dollars in savings.[1] As such, generics have typically been thought of as a cost effective way to access medications that are as efficacious as brand names.

However, this seems to be changing. Recent increases in cost of generics have affected various entities including hospitals, patients, and pharmacies, even leading to a congressional inquiry.[2-5] With rising prices, formularies are becoming restricted and many patients face higher out-of-pocket costs, ultimately preventing access to necessary medications.[6]

Increases in price have been noted when specific medications used in various specialties, including dermatology, have been analyzed.[7-11] However, there is a paucity of data in regards to generic prices and how severe this problem is for this category of medications. Our primary objective was to focus on price changes of generic topical medications used in dermatology to perform a comprehensive analysis to better understand how generic prices have changed over an 11-year period. Topical medications used in dermatology are frequently prescribed by many specialties including primary care, and therefore, by focusing on this medication class, we attempted to decipher the severity of this problem and to determine the possible underlying causes of price changes. Overall, our goal was to provide a better

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understanding of the opaque and complex pharmaceutical supply chain to patients, physicians, and policymakers.

METHODS

Study design and data collection

A pricing review of the average wholesale price (AWP) of generic topical medications in 2005 and 2016 was performed. The *Red Book* publishes manufacturer provided data regarding dosage, quantity, formulation, and pricing, including the AWP of prescription medications.[12] Data from 2005 was collected via the printed version of the *Red Book*,[12] while the web-based portal was used for the 2016 data set.[13] The *Red Book* provides product and pricing information for prescription and over-the-counter medications. All medication data collected in this study was from the prescription section.

CAPSULE SUMMARY

- Limited evidence is available regarding changes in generic dermatologic drug prices.
- Between 2005 and 2016, generic topical dermatologic medication prices increased by 273% while inflation only increased by 23%.
- Price increases of topical generic drugs reflect price increases at the manufacturing level.

Topical drugs

All pharmaceuticals from the prescription section listed in the 2005 *Red Book* were examined, and we identified all topical formulation prescription drugs (eg, ointments, creams, gels, lotions) with ≥1 generic version. Only topical medications with dermatologic applications were analyzed. If a branded version (those with a propriety trademark-protected name) with the same formulation and dose as the generic was also available, then data on that branded version was also collected. If no generic was available, data on that drug was not collected. *Red Book* includes prices of generics that have been repackaged by third-party wholesale distributers. These were excluded in our analysis because distributors rather than manufacturers set the prices for these repackaged products. For each collected drug, 2016 data was obtained via the *Red Book* web-based portal. We only collected data if a drug had data available in both 2005 and 2016 for the same formulation and dose. If such data was not available, the drug was discarded from our analysis. The data collected for each drug included formulation, dosage, manufacturer, quantity, and AWP.

Data analysis

For each formulation and dosage of every drug analyzed, we calculated the unit price (AWP divided by quantity sold) with the unit being either grams, milliliters, or number of applicators depending on the medication formulation. Subsequently, the average unit price of all manufacturers for each formulation and dosage of a given generic or branded drug was calculated for 2005 and 2016. The number of manufacturers for each generic was also quantified. All data was entered in Microsoft Excel and analyzed through its standard analysis functions.

RESULTS

Pharmaceutical characteristics

Our analysis identified 51 topical generic chemical entities. While each entity varied in the number of formulations and doses that met our criteria, each entity had ≥1 formulation and dose available in both 2005 and 2016. In addition to each entity having a generic form, 36 of the 51 entities had a branded version that also met our criteria. The medications were split into 2 groups: topical branded and topical generics.

Pricing analysis

The mean topical generic medication wholesale prices increased 273% from $0.85/unit (2005) to $3.17/unit (2016). In 2016, topical branded medications had the highest mean AWP of $8.38/unit. During the study period, the AWP of topical branded medications increased by 379%.

Upon evaluating individual medications of specific formulations and dosages, there was a considerable range in AWP changes. Among the topical generics, the combination cream of nystatin and triamcinolone had the highest price increase of 2529%. The most commonly prescribed topical drug, clobetasol propionate,[14] had some of the highest average price increases of 663% and 581% for the ointment and gel formulation, respectively. For a 30-g tube of clobetasol ointment, this translates to an AWP increase from $36.30 (average price of $1.21/unit) in 2005 to $276.90 (average price $9.23/unit) in 2016. Of the top 20 generics with the highest wholesale price increases, all had increases of at least 547% (Table I). Of all the entities analyzed, the branded versions of hydrocortisone 1% cream and fluorouracil 0.5% cream had the highest increase in AWP of 3223% ($0.26/unit to $8.64/unit) and 2857% ($3.52/unit to $104.07/unit), respectively. The per unit price of the generic version of

Table I. Top 20 topical generics with the highest percent increases in price

No.	Medication	Formulation	Strength	Average price increase, %	Manufacturers in 2005, N	Manufacturers in 2016, N
1	Nystatin-triamcinolone acetonide	Cream	100,000 unit/g-0.1%	2529	5	3
2	Nystatin-triamcinolone acetonide	Ointment	100,000 unit/g-0.1%	2409	4	3
3	Lidocaine	Ointment	5%	2284	2	11
4	Fluocinolone acetonide	Cream	0.01%	2264	4	3
5	Gentamicin sulfate	Cream	0.10%	1545	4	1
6	Gentamicin sulfate	Ointment	0.10%	1467	4	1
7	Fluocinolone acetonide	Cream	0.025%	1227	4	3
8	Fluocinolone acetonide	Solution	0.01%	1175	3	4
9	Desonide	Lotion	0.05%	754	2	4
10	Amcinonide	Lotion	0.10%	676	1	1
11	Clobetasol propionate	Ointment	0.05%	663	4	3
12	Erythromycin	Solution	2%	645	4	3
13	Desonide	Cream	0.05%	633	4	5
14	Diflorasone diacetate	Ointment	0.05%	628	2	1
15	Diflorasone diacetate	Cream	0.05%	628	2	1
16	Fluocinolone acetonide	Ointment	0.025%	611	2	3
17	Amcinonide	Ointment	0.10%	604	2	1
18	Clobetasol propionate	Gel	0.05%	581	3	4
19	Betamethasone dipropionate	Ointment	0.05%	553	3	2
20	Econazole nitrate	Cream	1%	547	3	4

hydrocortisone 1% cream decreased by 62%, which was the highest reduction among all the drugs analyzed.

Overall, the 51 topicals studied included 198 medications of specific doses and formulations. Of these, 176 had price increases, 4 had no price changes, and only 18 had price decreases.

Manufacturer analysis

Of the top 20 topical generic medications with the highest price increases, the number of manufacturers ranged 1-11. The median number of manufacturers for this group in 2005 was 3, which was the same as the median in 2016. Lidocaine cream had the highest increase in number of manufacturers from 2 to 11, while nystatin/triamcinolone cream had the largest decrease in manufacturers from 5 to 3.

DISCUSSION

Prescription expenditure in the United States increased by 9% to $325 billion in 2015 compared with 2014.[15] A key driver of such growth is the high price of branded drugs. Branded drugs receive 20-year patents that allow for market exclusivity, enabling high prices.[16,17] Generics, which undergo less testing having to only demonstrate equivalence to branded versions, enter the market once the patent has expired. Typically, the increase in manufacturers for generics leads to competition and subsequent lower prices.[18]

In our study, this pattern did not hold for topical generics as their prices continued to increase along with the topical branded versions. The percent increase among topical generics of 273% was much higher than the increase in inflation in the United States of 22.9% during the same time period.[19] Such increases in price are harmful to patients considering medications could be removed from formularies, prevent access, or lead to reduced drug adherence due to the high costs.[6,20] Even if medications remain on formularies, they might require prior authorizations, which can also be a burden; a recent survey found that physicians and their staff spend on average 16 hours/week doing tasks related to prior authorizations.[21] Arguably, such time would be better spent interacting with patients.

In a recent study, Rosenberg and Rosenberg examined retail prices of many brand name and some selected generic dermatologic drugs in Florida with findings similar to ours.[7] Instead of focusing on retail prices, we decided to focus on the AWP because that price often is the basis upon which different entities of the pharmaceutical supply chain negotiate their own prices and ultimately from which the retail price is derived. The AWP is often set by manufacturers and can be thought of as the list price or sticker price of the drug.[22,23]

However, given the complexity of the system and pricing, examining the AWP might not reflect actual

manufacturing price and, therefore, is a limitation of this study. The pharmaceutical supply chain is an extremely complex entity made up of various parties including patients, payers, pharmacy benefit managers, pharmacies, distributors, and manufacturers.[22] Often, prices between each of these entities is based on a percentage of the AWP. Moreover, manufacturers and other entities of the supply chain often provide discounts and rebates[24,25] for various reasons, such as, getting prescriptions on formularies or increasing market share.[18,22,26] This makes deciphering the exact price of a drug at the manufacturing level extremely difficult and likely accounts for the price differences seen between individual pharmacies and between the AWP and actual retail price.[27] Nonetheless, AWP is set by manufacturers and any increase in price at this level affects pricing to all members of the pharmaceutical supply chain.

Reduced competition from a decrease in the number of manufacturers, either through mergers and acquisitions or decisions to stop the production of certain medications, is often cited as the reason for the increase in prices.[28] Furthermore, with decreased manufacturers, any disruption in manufacturing can further limit supply and lead to price increases.[9,29] However, this explanation does not seem to fully pan out in our study, as only a little more than half of the top 20 generic topicals had a reduction in the number of manufacturers. Many actually had increases in manufacturers, with lidocaine ointment having the most while also being one of the topical generics that had the highest price increase. Some pharmaceutical companies have been recently relying on increased prices to drive revenue growth rather than attempting to increase the number of sales.[30] If generic topical companies also start to adopt this strategy, this would likely lead to reduced access for many patients for these necessary medications.

This study mainly focuses on topical medications mainly used in dermatology, and the trends observed might be limited to this medication class. Conducting a more comprehensive analysis of generic prices of medications used in other medical specialties would help determine if the findings in our study are generalizable to medications of other medical specialties. Even if our findings are isolated, our results should not be minimized because dermatologics represent the 11th-most prescribed medication class,[31] and, any increase in prices in topicals can dramatically affect patient care if access is limited. Moreover, while the AWP might not be the best metric to examine prices along the pharmaceutical supply chain,[32] it is a consistently published metric, enabling a pharmaceutical pricing analysis study to be conducted.

Fostering competition by increasing the number of generic manufacturers, importing generics from abroad, or accelerating the timeline for generic approval are all possible ways to help alleviate high prices.[6,16] While our study attempts to better inform physicians and policymakers of the pharmaceutical supply chain and the basis of generic price increases, unique solutions must be sought as ever increasing prescription medication costs are unsustainable and will ultimately burden health care delivery in the United States.

REFERENCES

1. Generic drug savings in the US. Generic Pharmaceutical Association, 2015. Available from: http://www.gphaonline.org/media/wysiwyg/PDF/GPhA_Savings_Report_2015.pdf. Accessed November 30, 2016.
2. Traynor K. Hospital pharmacies cope with surge in drug prices. *Am J Health Syst Pharm*. 2016;73:182-184.
3. Thompson D. What's behind the sharp rise in prescription drug prices? CBS News. August 24, 2016. Available from: http://www.cbsnews.com/news/whats-behind-the-sharp-rise-in-prescription-drug-prices. Accessed December 29, 2016.
4. Siconolfi M. Walgreen shakeup followed bad projection. Wall Street Journal. August 19, 2014. Available from: https://www.wsj.com/articles/walgreen-shakeup-followed-bad-projection-1408494546. Accessed Febuary 1, 2017.
5. Cummings and Sanders investigate staggering price increases for generic drugs. House Committee on Oversight and Government Reform, October 2, 2014. Available from: https://democrats-oversight.house.gov/news/press-releases/cummings-and-sanders-investigate-staggering-price-increases-for-generic-drugs. Accessed Nov. 7, 2016.
6. Tallapragada NP. Off-patent drugs at brand-name prices: a puzzle for policymakers. *J L Biosci*. 2016;3:238-247.
7. Rosenberg ME, Rosenberg SP. Changes in retail prices of prescription dermatologic drugs from 2009 to 2015. *JAMA Dermatol*. 2016;152:158-163.
8. Mailankody S, Prasad V. Five years of cancer drug approvals: innovation, efficacy, and costs. *JAMA Oncol*. 2015;1:539-540.
9. Alpern JD, Stauffer WM, Kesselheim AS. High-cost generic drugs—implications for patients and policymakers. *N Engl J Med*. 2014;371:1859-1862.
10. Thomas K. Soaring ointment prices area a dermatologic mystery. The New York Times. August 9, 2012. Available from: http://www.nytimes.com/2012/08/10/business/prescription-skin-creams-jump-in-price.html. Accessed January 29, 2017.
11. Song H, Adamson A, Mostaghimi A. Medicare part D payments for topical steroids: rising costs and potential savings. *JAMA Dermatol*. 2017;153:755-759.
12. *Red Book*. Montvale, NJ: Thomson PDR; 2005.
13. RedBook - Micromedex medication, disease, and toxicology management. Truven Health Analytics, 2016. Available from: www.micromedexsolutions.com. Accessed April 20, 2016.
14. Margosian E. New CMS data divulges dermatology prescription habits. *Dermatol World*. 2016;26(12):60.
15. National health expenditures 2015 highlights. Centers for Medicare and Medicaid Services. Available from: https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/downloads/highlights.pdf. Accessed Dec. 20, 2016.

16. Kesselheim AS, Avorn J, Sarpatwari A. The High cost of prescription drugs in the United States: origins and prospects for reform. *JAMA*. 2016;316:858-871.
17. Payette M, Grant-Kels JM. Generic drugs in dermatology: part I. *J Am Acad Dermatol*. 2012;66:343.e1-343.e8. quiz 51-52.
18. Payette M, Grant-Kels JM. Generic drugs in dermatology: part II. *J Am Acad Dermatol*. 2012;66:353.e1-353.e5. quiz 67-68.
19. CPI inflation calculator. Bureau of Labor Statistics, US Dept. of Labor, Published 2015. Available from: https://www.bls.gov/data/inflation_calculator.htm. Accessed January 5, 2017.
20. Barlas S. Generic prices take flight: the FDA is struggling to ground them. *P T*. 2014;39:833-845.
21. O'Reilly K. Survery quantifies time burdens of prior authorization. AMA, Jan. 30, 2017. Available from: https://wire.ama-assn.org/practice-management/survey-quantifies-time-burdens-prior-authorization. Accessed February 28, 2017.
22. Follow the pill: understanding the U.S. commercial pharmaceutical supply chain. The Henry J. Kaiser Family Foundation, March 2005. Available from: https://kaiserfamilyfoundation.files.wordpress.com/2013/01/follow-the-pill-understanding-the-u-s-commercial-pharmaceutical-supply-chain-report.pdf. Accessed January 10, 2017.
23. Gencarelli DM. Average wholesale price for prescription drugs: is there a more appropriate pricing mechanism? *NHPF Issue Brief*. 2002;775:1-19.
24. Dusetzina SB, Conti RM, Yu NL, Bach PB. Association of prescription drug price rebates in medicare part D with patient out-of-pocket and federal spending. *JAMA Intern Med*. 2017;177:1185-1188.
25. Gür Ali Ö, Mantrala M. Pharma rebates, pharmacy benefit managers and employer outcomes. *Health Care Manag Sci*. 2010;13:281-293.
26. Vega AD, Meola PP, Barcelo RJ Jr, Ruiz HM, Oh SA, Oh T. Commentary on current trends in rising drug costs and reimbursement below cost. *Manag Care*. 2016;25:41-49.
27. Alghanem N, Abokwidir M, Fleischer AB Jr, Feldman SR, Alghanem W. Variation in cash price of the generic medications most prescribed by dermatologists in pharmacies across the United States. *J Dermatolog Treat*. 2017;28:119-128.
28. Albrecht J, Lebwohl M, Asgari MM, et al. The state and consequences of dermatology drug prices in the United States. *J Am Acad Dermatol*. 2016;75:603-605.
29. Aitken M, Berndt ER, Cutler D, Kleinrock M, Maini L. Has the era of slow growth for prescription drug spending ended? *Health Aff*. 2016;35:1595-1603.
30. Walker J. For prescription drug makers, price increases drive revenue. Wall Street Journal. October 5, 2015. Available from: https://www.wsj.com/articles/for-prescription-drug-makers-price-increases-drive-revenue-1444096750. Accessed January 5, 2017.
31. *Medicines use and spending in the US: a review of 2015 and outlook to 2020. IMS Institute for Healthcare Informatics*. Parsippany, NJ: IMS Health; 2016.
32. Ubi S, Goozner M. Drug prices are the wrong target. *Mod Healthc*. 2016;46:30-31.