

Cost Comparison of Various Brands of Antihypertensives in the Indian Market with Drug Price Control Order List: An On-Foot Survey

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ABSTRACT

Background and Rationale: There are more than ten distinct categories of medications for hypertension, each with a different price tag. DPCO is the price list that provides the price cap of branded medications whereas CIMS and IDT are publications that provide the actual marketing price of available brands. Hence this study aimed to compare the DPCO pricing with the neighborhood pharmacies in south Bengaluru. **Materials and Methods:** The ceiling price for NLEM-listed antihypertensives was collected from DPCO 2013 (updated in 2018) and retrieved from the NPPA website and the marketed price of the same was collected from CIMS India (October 2022-January 2023) and IDT (July 2022-October 2022). An On-foot survey was conducted at nearby pharmacies and the same was compared. **Results:** Telmisartan 40 mg had the most substantial number of brands (51 brands) out of the 212 brands in CIMS-India and was sold above the DPCO recommended ceiling price. Out of 216 brands listed in IDT, Amlodipine 5mg was found to have a greater number of brands with Telmisartan 80 mg being sold greater than recommended price cap. There were 141 commercial brands for 17 different AHAs in local Pharmacies with Telmisartan 20 mg having the most brands and Ramipril 2.5 mg and 5 mg being sold above the fixed ceiling price. **Conclusion:** The majority of antihypertensives are profitability oppressed in a nebulous way. Government should revitalize pharmaceutical operations and broaden the present National List of Essential Medicines.

Keywords: Cost Comparison, Antihypertensive, DPCO, CIMS-India, India Drug Today, Local Community Pharmacy.

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INTRODUCTION

Increased blood pressure has been a "mute murderer" both in millennials and Generation Z, and the scientific community has labeled this illness as Hypertension (HTN).¹ HTN accounts for major fatalities worldwide. As reported by World Health Organisation (WHO), one in four adults are victims of HTN in India, wherein only 12% of them have blood pressure within limits.² HTN is the primary risk factor for Cardiovascular Diseases (CVD), and it can only be managed if patients are adherent to their meds as recommended.² It was previously understood that non-communicable illnesses account for 63% of all fatalities in India, with CVD accounting for 27% of deaths among those aged 40 to 69 years.³ The Indian government has embarked on the "Indian Hypertension Control Initiative" to lower the incidence of HTN to 25% by 2025.³ HTN, as we are all

aware, is a chronic condition that calls for ongoing care. To treat HTN, there are more than ten distinct categories of medications, each with a different price tag.⁴ Despite cost differences, all socio-economic strata utilize at least one type of Antihypertensive Agent (AHA).

The rising cost of AHA has had a significant influence on the capabilities of the population to afford the same, which has led to increasing morbidity and mortality rates in India.⁵ Because HTN preys on the middle-aged population, both the human resource and the nation's expanding economy are impeded. India, a growing nation, will therefore experience a human resource crisis that will have an impact on the nation's GDP as a whole.

In 1997, the Indian government established and accomplished the National Pharmaceutical Pricing Authority (NPPA).⁶ As patients in the country face a significant financial burden due to out-of-pocket expenses, particularly those who fall into lower income brackets,⁵ the NPPA evolved to guarantee that pharmaceuticals are accessible and inexpensive to the general population.⁷ Drug Price Control Order (DPCO), a measure put in place in 2013 by the Ministry of Chemicals and Fertilizers



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to lower the price of essential drugs, is governed by the NPPA, whose key mission is to set the price of essential medications, often referred to as the drug's ceiling price.^{8,9} It is an obligation that selling above the ceiling price is absurd and illegal. The government of India has granted NPPA accreditation to monitor the cost of medicines on the "National List of Essential Medicines (NLEM)".¹⁰ Pharmaceutical companies frequently sell branded medications over the recommended price,¹¹ in violation of established laws and regulations, which has a significant negative influence on the general public's economy and standard of living.

An organization called Current Index of Medical Specialties (CIMS) publishes a journal updating the cost of the brands that are offered in each nation. CIMS India is a biannual publication that reports on the price of branded pharmaceuticals.¹² Similarly, India Drug Today (IDT) is a quarterly publication that lists the prices of all the brands of drugs that are sold in the Indian pharmaceutical market.¹³

Despite the rules in place, community pharmacies often hike up the selling price of branded medications, making them harder to procure.¹⁴ Additionally, there is no information on how the antihypertensive drug's costs are affecting the general public. Therefore, this study aimed to compare the DPCO pricing with the neighborhood pharmacies in south Bengaluru.

MATERIALS AND METHODS

This research includes all AHA medications accessible via NLEM 2022 across different dosage forms along with strengths. The ceiling price for every pharmaceutical was collected from DPCO 2013 (updated in 2018) and retrieved from the NPPA website. CIMS India (October 2022-January 2023) and IDT (July 2022-October 2022) were regarded as reputable repositories of drug information and leveraged as benchmarks for commercial drug content. In this study, the market price that patients pay to purchase the same medicine with a fixed ceiling price for various AHA drugs were evaluated and compared. For this reason, we gathered data on the going rate for these AHAs at several neighborhood retail pharmacies in South Bengaluru. An excess of fifty community pharmacies in various locations were visited to learn about the advertised pricing and discovered details on the current availability and cost of branded AHAs during our visit to the pharmacy outlets. For all of the accessible branded medications, the unit costs in rupees were obtained. The costs of the brands that are currently on the market from IDT, CIMS, and pharmacy checkouts were compared to the ceiling costs for similar dosage formulations of medications from DPCO 2013 (updated in August 2018). One unit is equal to one tablet of a solid dosage form or one milliliter of a liquid dosage form, and this is how the cost of each AHA is expressed: in terms of Rs/unit.

The preceding aspects were investigated.

- Total number of brands overall accessible for each medication formulation.
- Total number of brands above and below the ceiling price.
- Percentage of brands above and below the ceiling price.

$$\text{percentage of brands} = \frac{\text{number of brands above or below ceiling price}}{\text{total number of brands}} \times 100$$

Cost ratio of every brand

The ratio of the priciest medication to the lowest-priced drug formulation is known as the cost ratio. Calculating how much more expensive the most expensive medication formulation is in comparison to the least expensive drug formulation is beneficial.¹⁵

$$\text{cost ratio} = \frac{\text{brand with maximum cost}}{\text{brand with minimum cost}}$$

Ethics committee approval for this study could be waived, since it uses data from sources like CIMS (October 2022-January 2023), IDT (July 2022-October 2022), and the local community pharmacies without including any patient data.

RESULTS

In this study, the collated pricing information for the various brands of AHAs mentioned in NLEM 2022 from reliable sources like CIMS-India and IDT were juxtaposed to data collected through an on-foot survey of neighborhood pharmacy chains. There is a total of 7 AHAs labeled in NLEM 2022, which fall either under one of two formulations-tablets or parenteral preparations-of which 16 AHAs are classified as tablets and two as parenteral preparations.

It was uncovered that there are a total of 212 brands listed in CIMS-India, 216 brands listed in IDT, and 141 brands accessible in neighborhood community pharmacies. Due to the unavailability of a ceiling price for tablets Labetalol 50 and 100mg in the DPCO list, this formulation has been dropped from the research.

Telmisartan 40mg had the most substantial number of brands (51 brands) out of the 212 brands in CIMS-India, whereas Labetalol injection 5mg/mL and Hydrochlorothiazide 12.5mg and 25mg had just 2 brands available. Both of the Labetalol 5mg/mL injectable brands (100%) were listed with a price that was more than DPCO's suggested ceiling price, followed by brands of Telmisartan 40 mg tablet (78.12%). The comparison between the DPCO pricing list 2018 and the general overview of CIMS-India brand medications is shown in Table 1 and Figure 1.

Out of 216 brands listed in IDT, Amlodipine 5mg was found to have a greater number of brands, whilst Labetalol 5mg/mL injectable and Hydrochlorothiazide 25mg tablet were included under the fewest number of brands, with just one and two brands, respectively. When compared to the DPCO ceiling price,

Table 1: Total number of brands with above and below ceiling price in CIMS-India compared to DPCO list 2018.

Drug name	Total no. of brands	No. of brands > CP	No. of brands < CP	% of brands above CP	% of brands below CP
Amlodipine 2.5 mg	22	12	10	54.54%	45.46%
Amlodipine 5 mg	34	20	14	58.82%	41.18%
Amlodipine 10 mg	14	7	7	50%	50%
Enalapril 2.5 mg	4	2	2	50%	50%
Enalapril 5mg	4	1	3	25%	75%
Labetalol injection 5 mg/mL	2	2	-	100%	0%
Ramipril 2.5 mg	12	7	5	58.33%	41.67%
Ramipril 5 mg	12	7	5	58.33%	41.67%
Hydrochlorothiazide 12.5 mg	2	1	1	50%	50%
Hydrochlorothiazide 25 mg	2	1	1	50%	50%
Telmisartan 20 mg	32	25	7	78.12%	21.88%
Telmisartan 40 mg	51	34	15	66.66%	33.34%
Telmisartan 80 mg	21	16	3	76.19%	23.81%

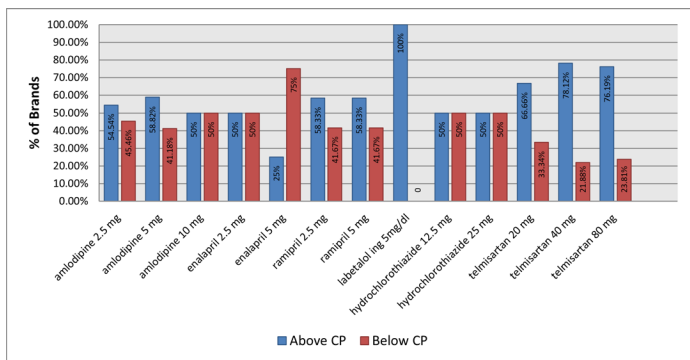


Figure 1: Number of brands above and below ceiling price in CIMS-India compared to DPCO list 2018.

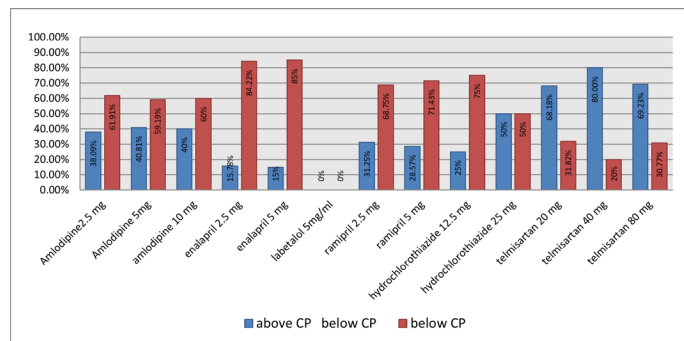


Figure 3: Number of brands above and below ceiling price in Local Community Pharmacy compared to DPCO list 2018.

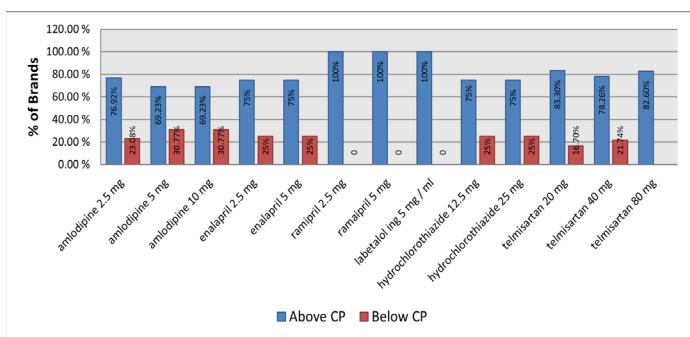


Figure 2: Number of brands above and below ceiling price in IDT compared to DPCO list 2018.

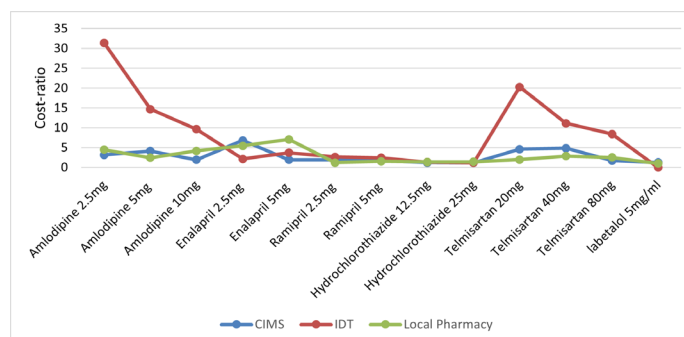


Figure 4: Cost-ratio of available brands of 7 AHAs in CIMS, IDT, and local community Pharmacies.

69.23% of brands of Telmisartan 80 mg were marked with a high marketing price. The second highest brand to be marked as costing more than the ceiling price was the brand that included Telmisartan 20 mg tablets (68.18%). In comparison to the 2018 DPCO pricing list, Table 2 and Figure 2 provide an overview of IDT brand medications.

According to an on-foot survey of more than 50 local community pharmacies in the South Bengaluru region, there were 141 commercial brands for 17 different AHAs. Telmisartan 20 mg has the most brands, with a total of 24, while Labetalol 5 mg/mL injectable has the fewest, with a total of two brands. All brands of Ramipril 2.5mg (31.25%), Ramipril 5mg (28.57%), as well as Labetalol 5mg/mL injectable (100%), are selling above the DPCO

Table 2: Total number of brands with above and below ceiling price in IDT compared to DPCO list 2018.

Drug name	Total no. of brands	No. of brands > CP	No. of brands < CP	% of brands above CP	% of brands below CP
Amlodipine 2.5mg	13	10	3	76.92%	23.09%
Amlodipine 5mg	13	9	4	69.23%	30.76%
Amlodipine 10mg	13	9	4	69.23%	30.76%
Enalapril 2.5mg	6	6	2	75%	25%
Enalapril 5mg	6	6	2	75%	25%
Ramipril 2.5mg	5	5	0	100%	0%
Ramipril 5mg	5	5	0	100%	0%
Labetalol 5mg/mL	2	2	0	100%	0%
Hydrochlorothiazide 12.5mg	4	3	1	75%	25%
Hydrochlorothiazide 25mg	4	3	1	75%	25%
Telmisartan 20mg	24	20	3	83.3%	16.7%
Telmisartan 40mg	23	18	5	78.26%	21.73%
Telmisartan 80mg	23	19	4	82.60%	17.39%

Table 3: Total number of brands with above and below ceiling prices in Local Community Pharmacy compared to DPCO list 2018.

Drug name	Total no. of brands	No. of brands > CP	No. of brands < CP	% of brands above CP	% of brands below CP
Amlodipine 2.5 mg	21	8	13	38.09%	61.91%
Amlodipine 5 mg	49	20	29	40.81%	59.19%
Amlodipine 10 mg	25	10	15	40%	60%
Enalapril 2.5 mg	19	3	12	15.78%	84.22%
Enalapril 5mg	20	3	14	15%	85%
Labetalol injection 5 mg/mL	1	-	-	-	-
Ramipril 2.5 mg	16	5	11	31.25%	68.75%
Ramipril 5 mg	14	4	7	28.57%	71.43%
Hydrochlorothiazide 12.5 mg	4	1	3	25%	75%
Hydrochlorothiazide 25 mg	2	1	2	50%	50%
Telmisartan 20 mg	22	15	7	68.18%	31.82%
Telmisartan 40 mg	10	-	2	-	-
Telmisartan 80 mg	13	9	4	69.23%	30.77%

ceiling price. The second-highest brands of medications sold over the DPCO ceiling price were those containing Telmisartan 20mg (83%). It was impossible to find Sodium-Nitroprusside at even one community pharmacy. It was also perceived that, because there weren't many prescriptions being filled, brands of Hydrochlorothiazide were less frequently purchased. Besides, it was shown that community pharmacies carry less of the parenteral AHAs that are readily available. When compared to the 2018 DPCO pricing list, Table 3 and Figure 3 show an overview of the brands of medications that are readily available locally.

Cost-ratio

Enalapril 2.5 mg was determined to have the highest cost ratio (6.8) in CIMS-India, followed by Telmisartan 40 mg (cost ratio

of 4.88). The drug with the lowest cost ratio was found to be Hydrochlorothiazide 25 mg with a score of 1.2.

In IDT, Amlodipine 2.5 mg was determined to have the highest cost ratio of 31.33, while Telmisartan 20 mg came in second with a cost ratio of 20.29. The drug with the lowest cost ratio was Hydrochlorothiazide 25mg with a score of 1.2.

Enalapril 5 mg was found to have the highest cost-ratio in nearby community pharmacies, at 7.06, followed by Enalapril 2.5 mg, at 5.48. 12.5 mg of Hydrochlorothiazide was shown to have the lowest cost ratio, which was 1.39. The cost-ratio of all 7 AHAs has been shown in Figure 4.

DISCUSSION

The most prevalent chronic disease in people in their middle years is HTN.^{2,3} India has a large population aged between 30 and 50 years, and the comorbidities caused by numerous lifestyle and socio-economic factors have led to an increase in many chronic diseases such as HTN, Diabetes, thyroid problems, and other emerging diseases. This population serves as the economic foundation of the nation because they make up the majority of the people in these age groups. Furthermore, such illnesses will have a bigger detrimental effect on one's quality of life.

In this demographic, cost-effectiveness and cost burden are quite important. In developing nations like India, frail gens would be the only wage earners for the family, indirectly influencing the family's standard of living as a whole. This gravely jeopardizes a nation's ability to flourish economically and physically. Therefore, the cost is crucial in managing a single family, which is ultimately equivalent to the entire nation.

It was ascertained that NLEM 2022 listed 7 AHAs has 212 brands that had been published in the October 2022 to January 2023 issue of CIMS-India, a standard publication for brands and their prices. Labetalol 5mg/mL and Hydrochlorothiazide 12.5mg and 25mg had the fewest brands in the Indian market, each having just two brands. It was also unexpected that, in comparison to the DPCO price list 2018, both brands of injectable Labetalol 5mg/mL were being offered over the price cap. This was also reported in research conducted by Kumar R. *et al.*¹⁶ Telmisartan 40mg has the most brands, 51, of any medication, and 34 of those brands were sold for more than the DPCO-recommended price. The fact that angiotensin-receptor blockers are now frequently recommended as first-line treatments for HTN, although telmisartan has shown to be the most effective and secure medication in this class, the marketing price was quite upsetting. This is because poorer households are burdened more, which reduces the population's access to Telmisartan, which was in line with the study conducted by Jhanwar A. *et al.*¹⁷ and Singh M. *et al.*,¹⁸ which showed this case. Amlodipine, a highly renowned medication in the HTN community, comes in third for brands selling against the DPCO suggested price order after Telmisartan. Every hypertensive patient finds this economically burdened as calcium channel blockers make up an integral part of HTN pharmacotherapy. The same was also observed in several other investigations.¹⁶⁻¹⁸ CIMS-India, being a speak of the devil, the regulatory authorities must take the appropriate steps to make branded medications available at the prices listed in the DPCO recommended price list, therefore easing the financial burden on the nation's economic developers.

India Drug Today is a quarterly journal that serves as a handy reference for the most recent drugs. It is a thorough listing of medications and dosage forms that examines health and medicine from a 360° perspective. Medical professionals frequently

utilize it for exploring the drugs sold on the market. For 7 AHAs, it was doped out that 216 brands are put forward. Telmisartan 20 mg holds the record for having the most brands among them (24 brands), followed by Telmisartan 40 mg and 80 mg, which all have 23 brands. This outcome was consistent with the cost comparison research conducted by Kumar *et al.*¹⁶ It was in line with earlier results that the least accessible brands are those that include Labetalol 5 mg/mL and Hydrochlorothiazide 12.5mg and 25 mg. For bye, it was contrived at IDT that around 20 brands of Telmisartan 80 mg, 40 mg, and 20 mg were being offered for a price that was higher than the DPCO-set ceiling price. In conformity with the findings in CIMS, all 2 brands of injectable Labetalol 5 mg/mL were being sold for higher than the DPCO ceiling price in IDT. Even though Labetalol 5 mg/mL is a frequent emergency drug used for hypertensive crisis conditions,¹⁹ the financial load on the family would be unfathomable. Knowing what people feel in times of need, the aforementioned brands are taking advantage of their wide range of financial and psychological assets. It was contended to Twig that the most brands of Amlodipine 5mg and 10mg were sold below the DPCO-set ceiling price.

The majority of the public purchases their medications from neighborhood pharmacies. It is generally documented that numerous drugs had been misappropriated during the COVID era in ways that were both expensive and had a significant impact on many lives.²⁰ This on-foot survey conducted at local community pharmacies aimed to learn the plundering of cost for 7 AHAs accessible brands to understand in a larger context. Overall, 141 commercial brands were revealed to be offered for the NLEM-listed AHAs. Amlodipine 5mg is the most popular of them, with 49 brands. This picture shows the wide use of Amlodipine 5 mg in the community as seen in Marjan W Attai *et al.*²¹ and Shah RB *et al.*²² The least number of brands were brought into light for Hydrochlorothiazide 25mg in the local pharmacy. We found that fewer Hydrochlorothiazide prescriptions were completed, which resulted in a smaller procurement window. This might be understood to mean that the use of Hydrochlorothiazide among Indians is owing to several adverse consequences brought on by prolonged use, such as cutaneous neoplasms, pulmonary edema, hypersensitivity responses, and so forth.²³⁻²⁶ Supplementarily, it was noticed that 69.23% of brands containing Telmisartan, which belonged to the ARB family of AHAs, are being marketed for a price higher than the DPCO-recommended price. Likewise, it was made known in earlier research by Gujjarlamudi HB *et al.*²⁷ and Deolekar P *et al.*²⁸ Unfortunately, no community pharmacies in the area had Injectable Labetalol 5mg/mL as a consequence of the findings in the CIMS and IDT. Although Labetalol 5mg/mL should only be used in a pinch, it is still a prudent decision to acquire and capitalize on at least one brand of Labetalol from the nearby pharmacies. Enalapril 5mg was acknowledged to be offered in 84.22% of brands for less than the set price, making the medication more affordable for consumers. Few pharmacists were unfamiliar with the generic names during the study, and

when the brand name was said aloud, the pharmacists were able to identify it. Few of the pharmacists were not willing to provide information.

The cost ratio of a medicine, which was previously defined, indicates how much more costly the most expensive medication formulation is in contrast to the least expensive drug formulation. Hydrochlorothiazide had the lowest cost ratio (1.2), whereas Amlodipine 2.5 mg had the highest (31.33).

This study displayed the significant pricing differences across the brands that are readily accessible for the seven AHAs recognized by NLEM in India. This provides a clue as to how to combat cost-exploitation, make widely prescribed long-term pharmaceuticals available to the general people, and lower the danger of chance of economic hardship. This should also be leveraged for persuading the government to address the financial problems in retail pharmacies and stop this massive extortion.

Few branded medicine prices were not included in IDT, which prevented us from determining the cost ratio for certain brand categories. There are plenty more brands that are used in the management of HTN and are being marketed; however, this study is only descriptive and focuses on AHAs that are listed in the NLEM. The exhaustive survey was constrained by the authors' visits to just around 50 local community pharmacies. On top of that, this does not concentrate on pharmacies like those found in hospitals, clinics, ambulatory care facilities, and so on.

CONCLUSION

The majority of prescription long-term medications are antihypertensives, which are profitability oppressed in a nebulous way. To reduce expenses, many regulatory laws and regulations have been implemented; nonetheless, the control of the economic burden on the patrons has not been much reduced. The DPCO provided by NPPA has been made standard and available to the public to establish the retail price, yet it still is unsuccessful in clinching that all Indians have access to and can afford medications. This is a result of its constrained scope and market-based approach to pricing oversight. Among other things, the government should try to revitalize pharmaceutical public sector operations, establish ceiling pricing based on least expensive alternatives rather than most expensive top sellers, and broaden the present National List of Essential Medicines

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

HTN: Hypertension; **WHO:** World Health Organization; **CVD:** Cardiovascular Diseases; **AHA:** Antihypertensive agents; **GDP:** Gross Domestic Product; **NPPA:** National Pharmaceutical Pricing Authority; **DPCO:** Drug Price Control Order; **NLEM:** National List of Essential Medicines; **CIMS:** Current Index of Medical Specialties; **IDT:** India Drug Today; **ARB:** Angiotensin Receptor Blockers.

SUMMARY

Hypertension (HTN) contributes to major fatalities worldwide. To treat HTN, there are more than ten distinct categories of medications, each with a different price tag. Despite cost differences, all socio-economic strata utilize at least one type of Antihypertensive Agent (AHA). Hence, the aim of this study was to compare the cost of AHAs with DPCO and Indian Market. The ceiling price for every AHAs was collected from DPCO 2013 (updated in 2018) and retrieved from the NPPA website. CIMS India (October 2022-January 2023) and IDT (July 2022-October 2022) was compared with price obtained from local community Pharmacies. It was found that telmisartan 40 mg had the significant number of brands in CIMS India and was sold above the DPCO ceiling price cap. Additionally, telmisartan 80mg was being sold at a price greater than DPCO recommended price cap with respect to IDT. Telmisartan 20mg had a greater number of brands, whereas ramipril 2.5mg and 5mg were found to be sold above the fixed ceiling price in local community pharmacies. It can be concluded that commonly used AHAs were oppressed in a nebulous way.

REFERENCES

1. CDC Global Health-Stories-eradicating hypertension, the "Silent killer," in rural India [internet]. Centers for Disease Control and Prevention; 2018 [cited Apr 7 2023]. Available from: <https://www.cdc.gov/globalhealth/stories/eradicating-hypertension-in-rural-india.htm>.
2. Geldsetzer P, Manne-Goehler J, Theilmann M, Davies JI, Awasthi A, Vollmer S, et al. Diabetes and hypertension in India: A Nationally Representative Study of 1.3 million Adults. *JAMA Intern Med.* 2018;178(3):363-72. doi: 10.1001/jamainternmed.2017.8094, PMID 29379964.
3. Hypertension [internet]. World Health Organization [cited Apr 11 2023] Available from: <https://www.who.int/india/health-topics/hypertension>.
4. DiPiro JT, Yee GC, Posey LM, Haines ST, Nolin TD, Ellingrod VL. Pharmacotherapy: A pathophysiologic approach. New York: McGraw-Hill Medical; 2020.
5. Sharma H, Kumar A, Kaur S, Singh J, Sharma G. Cost analysis of oral antihypertensive drugs: assessing the effect of Drug Price Control Order in India. *Asian J Pharm Clin Res.* 2022;73-6. doi: 10.22159/ajpcr.2022.v15i9.46092.
6. National pharmaceutical pricing authority department of pharmaceuticals [internet] [cited Apr 12 2023]. Available from: <https://pharmaceuticals.gov.in/national-pharmaceutical-pricing-authority>.
7. Functions of NPPA [internet] [cited Apr 12 2023]. Available from: <https://www.nppaindia.nic.in/wp-content/uploads/2020/07/Functions-of-NPPA.pdf>.
8. Drugs (prices control) order, 2013 department of pharmaceuticals [internet] [cited Apr 12 2023]. Available from: <https://pharmaceuticals.gov.in/circulars/drugs-price-s-control-order-2013>.
9. The drugs (prices control) order [internet] [cited Apr 12 2023]. Available from: https://www.nppaindia.nic.in/wp-content/uploads/2018/12/DPCO2013_03082016.pdf.

10. National list of essential medicines (NLEM); 2022. Ministry of Health and Family Welfare: GOI [cited Jun 18 2023]. Available from: <https://main.mohfw.gov.in/newshighlights-104>.
11. Kotwani A. Where are we now: assessing the price, availability and affordability of Essential Medicines in Delhi as India plans free medicine for all. *BMC Health Serv Res.* 2013;13(1):285. doi: 10.1186/1472-6963-13-285, PMID 23885985.
12. Team C by Mimso. Advanced drug search. Center for Immigration and Multicultural Studies India [internet] [cited Apr 13 2023]. Available from: <https://www.mims.com/India/drug/AdvancedSearch/>.
13. Live Updates, Breaking News, Latest Health and Medical Headlines [internet] [cited Apr 13 2023]. Available from: <https://www.drugtodayonline.com/>.
14. Hassali MA, Siang TC, Saleem F, Aljadhey H. A qualitative exploration of perceptions toward pharmaceutical price war among community pharmacists in the State of Penang, Malaysia. *J Med Mark Dev Diagn Pharm Mark.* 2013;13(1):44-53. doi: 10.1177/1745790413477648.
15. Amaravati R, Kandra N. Cost analysis of oral hypoglycemic agents available in Indian Pharmaceutical Market. *Natl J Physiol Pharm Pharmacol.* 2023;13(7):1. doi: 10.5455/njppp.2023.13.12584202220122022.
16. Kumar R, Kumar N, Ahmad A, Kumar M, Nath R, Dixit RK, *et al.* Cost comparison of antihypertensive drugs available in India with drugs prices control order price list. *Int J Res Med Sci.* 2018;7(1):101. doi: 10.18203/2320-6012.ijrms20185124.
17. Jhanwar A. Pharmacoeconomic analysis of various brands of commonly prescribed oral antihypertensive medicines in Indian market. *Asian J Pharm Clin Res.* 2022;15(3):47-9. doi: 10.22159/ajpcr.2022.v15i3.44092.
18. Singh M, Pragzna Y, Bommi DD. Current situation of availability and Cost Effectiveness analysis of selected drugs in Anantapur, AP, India. *J Appl Pharm.* 2012;30:179-85.
19. Shi DD, Yang FZ, Zhou L, Wang N. Oral nifedipine vs. intravenous labetalol for treatment of pregnancy-induced severe pre-eclampsia. *J Clin Pharm Ther.* 2016;41(6):657-61. doi: 10.1111/jcpt.12439, PMID 27578562.
20. Buciuța A, Coman H, Cozman D. Admissions of psychoactive substance users in Romanian psychiatric hospitals. *Psihiatru.ro.* 2018-2021;2(69):5:2022. doi: 10.26416/psih.69.2.2022.6627.
21. Attai MW, Khatib R, McKee M, Lear S, Dagenais G, Igumbor EU, *et al.* Availability and affordability of blood pressure-lowering medicines and the effect on blood pressure control in high-income, middle-income, and low-income countries: an analysis of the PURE study data. *Lancet Public Health.* 2017;2(9):e411-9. doi: 10.1016/S2468-2667(17)30141-X, PMID 29253412.
22. Shah R, Desai S, Gajjar B. Drug utilization pattern among geriatric patients assessed with the anatomical therapeutic chemical classification/defined daily dose system in a rural tertiary care teaching hospital. *Int J Nutr Pharmacol Neurol Dis.* 2012;2(3):258. doi: 10.4103/2231-0738.99480.
23. Bright HR, Chandy SJ, George R, Thomas M, Rajkumar P, George A. Long-term hydrochlorothiazide use and risk of cutaneous neoplasms. *Curr Med Issues.* 2021;19(4):264. doi: 10.4103/cmi.cmi_36_21.
24. Vandell AG, McDonough CW, Gong Y, Langae TY, Lucas AM, Chapman AB, *et al.* Hydrochlorothiazide-induced hyperuricaemia in the pharmacogenomic evaluation of antihypertensive responses study. *J Intern Med.* 2014;276(5):486-97. doi: 10.1111/joim.12215, PMID 24612202.
25. Lake CR, Ziegler MG, Coleman MD, Kopin JJ. Hydrochlorothiazide-induced sympathetic hyperactivity in hypertensive patients. *Clin Pharmacol Ther.* 1979;26(4):428-32. doi: 10.1002/cpt1979264428, PMID 487689.
26. Bernal C, Patarca R. Hydrochlorothiazide-induced pulmonary edema and associated immunologic changes. *Ann Pharmacother.* 1999;33(2):172-4. doi: 10.1345/aph.18191, PMID 10084412.
27. Gujjarlamudi HB, Jose A, Dupaguntla R. Cost analysis of ACE inhibitors and ARBs used in essential hypertension. *Asian J Pharm Pharmacol.* 2018;4(3):275-9. doi: 10.31024/ajpp.2018.4.3.6.
28. Deolekar DP, Yadav P, Deolekar S. Cost-effectiveness analysis of antihypertensive drugs available in Indian market. *World J Pharm Res.* 2017;6(10):833-40. doi: 10.20959/wjpr201710-9373.

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