Original Article

A Study of the People's Medicine Scheme in Mumbai and Thane region, India with reference to Cancer and Diabetes medicines

Running Title: Medicine Scheme for Cancer and Diabetes

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Abstract

Background: In India, availability of low cost generic drugs to reduce out-of-pocket expenditures on medicines by households has been a challenge over the decades. To address this issue, the Government of India revamped the existing Jan Aushadhi Scheme (JAS) launched in 2008, as the Prime Minister's Peoples Medicine Scheme in 2014.*Objectives*: This study analyses the cost difference of cancer and diabetes medicines under the scheme with its branded counterpart as well as issues related to availability of these medicines in western India. *Methodology:* It's a cross-sectional study. Telephonic interviews and email correspondence with pharmacists of JAS stores in Mumbai and Thane region. Secondary data from JAS and Medguide India websites has been analysed. Primary data was collected to study the availability of medicines in these stores. Percentage difference, average and standard deviation have been computed. *Findings:* The findings showed that some medicines for both cancer and diabetes listed under the scheme were available at a cheaper rate in the branded market. Also, prices were not found to be uniform in all JAS stores and supply of cancer medicines was found to be poor. *Conclusions:* This study highlights the need for a more effective procurement process under the scheme to bring down medicine prices and increase their availability. Price discrepancy for some of the medicines in JAS stores is also a matter of concern. Visibility of these stores needs to be increased to create awareness for accessing these low-cost medicines. *Recommendation:* This study has four recommendations for a more effective impact of this scheme to reduce the OOP expenditure on medicines in India.

Key-words: Generic drugs, branded and non-branded generic drugs, generic stores, cancer medicines, diabetes medicines, people's medicine scheme, price difference, pooled procurement, mixed purchase system.

Introduction

In India, the out-of-pocket (OOP) private expenditure on healthcare by households was alarmingly high at 89% in 2014 as per World Health Organization's Global Health Expenditure Data, while the Global Average for OOP expenditure was 45.53% in 2014. The expenditures made for purchasing medicines for non-hospitalised treatments are 68% and 72% respectively of the urban and rural population in India [1].

However, the rural-urban difference in healthcare expenditure in both out-patient and in-patient in public health facilities is not so stark. However, the rural-urban difference in healthcare expenditure is very high in private health facilities. It has also been noted that the hospitalisation cost has risen by more than 100% in private health facilities, while the cost escalation in public health facilities has been gradual during the period of 1993-94 and 2004-05. It has thus resulted in catastrophic OOP health expenditures, mainly in the private sector, which have been pushing people below the poverty level [2]. It is to be noted that catastrophic OOP expenditures pushes 32-39 million people below the poverty annually in India [3].

Ensuring access to affordable essential medicines in public facilities in order to reduce the OOP expenditure on medicines has remained a challenge over the decades. As mentioned in one of the studies, despite the steadily growing pharmaceutical industry in India, about 50%-65% of the population does not have access to essential medicines [4]. As per the National List for Essential Medicines (NLEM)-2015 [5], out of 376 medicines (against WHO's 414), prices of only 46 medicines are controlled by the Drug Price Control Order (DPCO) - 2013, under the National Pharmaceutical Pricing Authority, Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers.

The access to medicines includes essential medicines as well as generic medicines. Generic drugs are low-cost as these are off-patented. After the Patent Act 2005, all drugs are generic in nature whether produced under brand names or are non-branded [6]. Hence, the competition is between the branded generics and the non-branded generics as the former are more expensive and also marketed well.

However, the acceptability of low-cost generic medicines in India is very low due to the mistaken perception regarding the efficacy of (non-branded) generic medicine among patients and physicians, which may be attributed to the extensive marketing of branded medicines by the pharma companies [3]. It's an irony that the booming pharmaceutical industry in India as a supplier of generic drugs is not able to meet the affordable access to medicine of its people because of lack of a price-control mechanism.

In this context, the Government of India launched in its 11th Five Year Plan in 2008, the Jan Aushadhi Scheme (People's Medicine Scheme) for providing access to affordable quality generic medicines to its people to reduce the OOP expenditures on medicines. The objective of the scheme was to supply such affordable non-branded generic medicines through Jan Aushadhi Stores opened in public health facilities of the centre as well as the states with a plan to open in all existing 612 districts of the country of that time.

This scheme is now known as the Pradhan Mantri Bhartiya Janaushadhi Pariyojna (PMBJP) (Prime Minister People's Medicine Scheme for the Indians) since 2014 and the Jan Aushadhi Stores are known as Pradhan Mantri

Bhartiya Janaushadhi Kendra (PMBJK) and was revamped with the Strategic Action Plan (SAP 2015) prepared by various stakeholders and approved by the Hon'ble Minister for Chemical and Fertilizer in September, 2015. The key areas of significance have been identified were availability, affordability, awareness and effective implementation of the scheme [7]. The number of districts in India has in this time period increased to 707.

Currently, under this scheme 3,037 stores are available across India, of which 202 stores are in Maharashtra as opposed to 8,50,000 private pharmacies available in India in 2017 [8,9]. This study has been done with 10 operational stores out of 12 in Mumbai and Thane regions as opposed to the 249 private pharmacies registered in the two regions as of 2016 [10]. Also, except two stores, no other stores are located in civil hospitals which may hinder the knowledge and visibility of such stores to the patients. It is understandable that reaching out to every citizen of India with lower priced generic drugs is a distant dream.

It is noted that non-communicable diseases (NCDs) are the leading causes of adult mortality and morbidity worldwide and India is becoming a major contributor to this disease burden especially for cancer and diabetes. In 2015, an estimated 40 million deaths occurred due to NCDs, accounting for 70% of the overall total of 56 million deaths globally and out of which cancer accounted for 8.8 million deaths (22%) and diabetes accounted for 1.6 million deaths (4%) [11]. According to The Indian Council of Medical Research (ICMR) the total number of new cancer cases in India is expected to be around 17.3 lakh in 2020 as compared to 14.5 lakh cases in 2016. An estimated number of deaths due to cancer will rise to 8.8 lakh by 2020 compared to 7.34 lakh deaths in 2016 [12]. There were 69.1 million cases of diabetes in India of which 52.1% of adults with diabetes was undiagnosed as per the International Diabetes Federation (IDF) Diabetes Atlas- 7th edition, 2015, and the diabetes-related deaths in 2015 itself were 1,027,900 adults [13]. Given the increasing burden of NCDs in India, this study focuses on the functioning of this scheme (PMBJP) with respect to cancer and diabetes.

Previous studies have focused on quality equivalence of generic drugs in the PMBJKs and also on the cost analysis of the generic medicines of three categories of commonly prescribed drugs that are available at PMBJKs [14,15]. However, the cost implications of medicines of cancer and diabetes and the study on understanding drug supply and its availability in the PMBJKs have not been done before.

Objectives

1. To analyse the cost difference between PMBJKs drugs and branded drugs for cancer and diabetes in India,
2. To understand issues related to availability of medicines for cancer and diabetes across PMBJKs in Mumbai and Thane region.
3. To provide policy recommendations based on the above findings.

Methodology

The study compared secondary data available from the price list on PMBJP website, with equivalent branded generic medicines of cancer and diabetes available on MedguideIndia website [16,17]. The PMBJP price list is dated March, 2017. This study analysed all the 10 anti-cancer medicines and 29 anti-

diabetes medicines given in PMBJP price list.

Primary data of the price list was collected from various PMBJKs, which are available in Mumbai and Thane region, to look at the availability of medicines of cancer and diabetes. As per PMBJP website accessed in September, 2017, 12 stores are available in Mumbai and Thane regions. Primary data was collected through telephonic conversation and through email correspondence. Out of 12 stores, one store has closed down and another will be opening shortly. Effectively 10 stores are operational. This study looked into the effect of the PMBJP in practice. Out of 10 stores 9 stores responded to the queries through mail and telephonic conversation. The list of respective MRP (Maximum Retail Price) lists of seven stores for cancer and diabetes were received.

The percentage difference of the prices of PMBJP medicines and branded generic medicines were compared. Also, this study analysed the average price of branded generics with the highest and lowest price of PMBJP medicines. The standard deviation of the branded generic medicines has also been calculated to show the price deviation. The price differential between the stores to show the different practices of this scheme in different stores was also analysed.

Limitations

This study is limited to Mumbai and Thane region only. Availability of larger data set would be useful to ascertain the cost difference more conclusively. Also, information on the procurement of medicines in these stores could not be availed.

Findings

Table-1 Complete List of Injections for Anti Diabetes available under PMBJP

Sl. No.	Name of the drug	Package Unit	PMBJP Price (Rs.)	No. of Brands	Branded Price (INR)	Branded Price (INR) % Difference With PMBJP Price
1	Insulin Injection IP 40 IU/ml (Insulin Human Recombinant)	10 ml	118.61	1	145.55	22.71
2	Biphasic Isophane Insulin Injection IP 4O IU/ML (50:50)	10 ml	67.00	NA*	NA	NA
3	Insulin Glargine 100 IU Injections	3ml	200.00	1	460.00	130.00
	*NA- Not available					

A total of three types of anti-diabetic injections in Table-1 are available in PMBJKs, of which Insulin 10 ml vial is commonly used. Availability of branded

anti-diabetic injections is very limited. Both the branded equivalent medicines have higher price than the medicines available under PMBJP scheme. It is found that Biphasic Isophane Insulin Injection IP 4O IU/ML (50:50) is not available in the branded market.

Table-2 Complete List of Single Generics for Anti Diabetes Tablets under PMBJP

Sl. No.	Name of the drug	Package Unit	PMBJP Price (Rs.)	No. of Brands	Branded Price Average	Branded Price Standard Deviation	Branded Price (INR)		Branded Price (INR) % Difference With PMBJP Price	
							Lowest	Highest	Lowest	Highest
1	Glibenclamide 2.5 mg	10 tabs	2.6	17	3.36	1.01	2.6	6.5	0	150
2	Glibenclamide 5 mg	10 tabs	4.05	32	6.65	3.17	1.95	10.91	-51.85	169.38
3	Gliclazide 40 mg	10 tabs	11.93	37	10.50	5.34	10.0	37.50	-16.18	214.33
4	Gliclazide 80 mg	10 tabs	20.25	91	11.00	5.05	14.0	94.90	-30.86	368.64
5	Glimeperide 1mg	10 tabs	3.80	137	11.50	4.76	7.20	62.50	89.47	1544.74
6	Glimeperide 2mg	10 tabs	5.05	137	12.00	4.47	9.00	159.0	78.22	30485.51
7	Glipizide 5 mg	10 tabs	2.50	45	12.5	4.18	1.48	16.90	40.80	576.00
8	Metformin Hydrochloride SR 1000 mg	10 tabs	11.05	1	NA	NA	35.7		223.07	
9	Metformin Hydrochloride SR 500 mg	10 tabs	8.85	1	NA	NA	18.06		104.06	
10	Pioglitazone 15 mg	10 tabs	6.75	84	14.00	3.32	8.50	83.50	25.92	1137.03
11	Pioglitazone Tablets I.P. 30 mg	10 tabs	10.69	81	14.50	3.03	16.0	122.5	62.58	1045.93
12	VOGLIBOSE IP 0.2 mg	10 tabs	9.61	42	15.00	2.74	19.5	95.00	102.91	888.55
13	VOGLIBOSE IP 0.3 mg	10 tabs	9.92	44	82.27	17.22	29.5	135.0	197.38	1260.88
14	Gliclizide 60 mg	10 tabs	37.62	18	67.97	30.72	21.0	129.0	44.18	242.9
15	AcarboseIP 50 mg	10 tabs	55.90	26	16.50	1.87	62.0	120.0	10.91	114.67
16	Glimipride 3 mg tablet	10 tabs	3.78	26	65.85	31.51	30.0	150.0	693.65	3868.25
17	Glimipride 4 mg tablet	10 tabs	4.37	31	72.11	28.55	22.0	139.5	403.43	3092.22
18	Metformin SR Tablets IP 850mg	10 tabs	12.38	29	14.97	5.24	10.85	32.00	12.36	158.48

19	Teneligliptin Film coated 20mg	10 tabs	49.50	1	NA	NA	165.00	233.33

A total of 19 single generic tablets in Table-2 for anti-diabetes are available in the stores under PMBJP. Glimeperide 1mg and 2mg tabs have the highest number of branded generics available in the market. Both have 137 brands each.

It is also noted that out of 19 medicines, seven medicines namely Gliclazide 40 mg ,Gliclazide 80 mg, Glimeperide 2mg , Glipizide 5 mg, Gliclizide 60 mg and Metformin 850mg available in the PMBJKs have a lower price option in the branded generic market. Glimperide 2mg is available in the branded market at a 78% lower price. Gliclazide 80 mg is available in 91 brands at a 30.86% lower price.

Glibenclamide 2.5mg has the lowest mean price and also the lowest standard deviation in the branded generic market. Also, this is the only medicine which is available in the branded market at the same rate for its lower version as it is available in the PMJBKs. Voglibose 3mg has the highest average branded price of 82.27, however, it has a standard deviation of 17.22 which is quite lower than some of the medicines available in branded generic market with a lower average price.

Glimipride 3 mg has the maximum price difference with its counterpart available in the branded market. The lowest version and the highest version are available in the branded generic market are at higher rates of 693.65% and 3868.25% respectively. Metformin Hydrochloride SR 1000 mg, 500mg and Teneligliptin Film coated 20mg are available in only one brand at a higher price.

Table-3 Complete List of Fixed Dose Combination Generics for Anti Diabetes Tablets under PMBJP

Sl. No.	Name of the drug	Package Unit	PMBJP Price (Rs.)	No. of Brands	Branded Price Average	Branded Price Standard Deviation	Branded Price (INR)		Branded Price (INR) % Difference With PMBJP Price	
							Lowest	Highest	Lowest	Highest
1	Metformin (SR) 500mg+Pioglitazone 15 mg	10 tabs	13.97	58	4.00	2.16	19.0	77.0	36.0	451.18
2	Glipizide5 mg + MetforminHydrochloride500mg	10 tabs	6.80	41	12.39	5.11	6.70	34.75	1.47	411.03
3	Gliclazide 80 mg +MetforminHydrpchloride500 mg	10 tabs	32.06	158	41.84	12.18	7.50	86.00	76.61	168.25
4	Glimepiride2 mg +Metformin500 mg SR	10 tabs	17.78	143	5.00	1.58	25.0	143.0	40.61	704.27
5	Glimepiride 1mg +Metformin500mg	10 tabs	6.73	126	5.50	1.29	12.0	79.0	78.31	1073.85

6	Voglibose0.2mg+Metformin 500mg	10 tabs	13.97	15	65.69	14.78	36.0	85.0	157.69	508.45
7	Voglibose0.3 mg+Metformin 500mg	10 tabs	19.89	13	87.55	17.93	53.0	106.0	166.47	432.93

Seven types of medicines shown in Table-3 are available in combination generics in the PMBJKs.

Voglibose 0.3 mg in combination with Metformin 500mg has the maximum mean price and the standard deviation and it is available in the market in 13 different brands. Metformin (SR) 500mg in combination with Pioglitazone 15 mg, has the lowest mean price of 4.00 and Glimepiride 1mg Metformin 500mg has the lowest standard deviation of 1.29. Gliclazide 80 mg in combination with Metformin Hydrochloride 500 mg is available in most number of brands and also its lowest option is available in the branded market at a 76.61% lower price. Glimepiride 1mg in combination with Metformin 500mg has the maximum price difference of 1073.85% in the branded generic market for its highest available option which is quite alarming.

It was also found that Insulin is listed in the NLEM-2015. However, in tablets, only three medicines namely Glibenclamide, Glimepiride and Metformin in single generics are enlisted in the NLEM-2015. No anti-diabetic medicines under 'Combination Generics' are enlisted in NLEM-2015.

Table-4 Complete List of PMBJP Generic Medicines for Anti-Cancer under PMBJP

Sl. No.	Name of the drug	Package Unit	PMBJP Price (Rs.)	No. of Brands	Branded Price Average	Branded Price Standard Deviation	Branded Price (INR)		Branded Price (INR) % Difference With PMBJP Price	
							Lowest	Highest	Lowest	Highest
1	Doxorubicin 10 mg Inj. IP	Vial	76.49	33	235.20	53.75	28.47	347.00	62.78	353.65
2	Doxorubicin 50 mg Inj. IP	Vial	250.47	31	876.76	219.85	118.63	1540.0	52.64	514.84
3	Gemcitabine 1000 mg Inj. IP	Vial	631.21	21	6105.9	738.17	5310.0	8290.0	741.24	1213.35
4	Gemcitabine 200 mg Inj. IP	Vial	154.49	22	1358.34	259.14	900.00	2250.00	428.56	1356.40
5	Bortezomib Injection 3.5 mg	Vial	3188.00	3	17346.67	2214.62	15000.0	19400.0	370.51	508.53
6	Oxaliplatin Injections 50mg	Vial	430.00	15	2344.20	315.80	1740.0	2800.0	304.65	551.16
7	Paclitaxel Injection 100mg	Vial	540.00	23	4848.48	961.27	3780.0	8076.0	600.00	1395.55
8	Tamoxifen Citrate Tablets I.P. strength 10 mg	10 tabs	9.56	22	31.34	38.38	11.50	200.0	20.29	1992.05

9	Tamoxifen Citrate Tablets I.P. strength 20 mg	10 tabs	13.50	15	36.09	10.40	18.00	55.00	33.33	307.41

Under the PMBJP, 10 varieties of medicines in Table-4 are available for anti-cancer treatment of which seven types are in injection form and three types are in tablet form. It is also noted that Doxorubicin 10 mg Inj. and Doxorubicin 50 mg Inj. are most common in the branded generic market. Both the medicines are available in the branded market at 62.78% and 52.64% lower price respectively. Paclitaxel Injection 100mg has the highest average price and standard deviation. Bortezomib Injection 3.5 mg is most expensive medicine available in PMBJKs. It has highest average price and standard deviation in the branded equivalent with availability in three brands.

It is found that all the medicines of anti-cancer treatment are listed in the NLEM-2015.

Table-5 Price List of Diabetes medicines available across PMBJKs in Mumbai and Thane region

Sl. No.	Name of the drug	Package Unit	MRP PMBJP	MRP Store-1	MRP Store-2	MRP Store-3	MRP Store-4	MRP Store-5	MRP Store-6	MRP Store-7
1	Glibenclamide 2.5 mg	10 tabs	2.60	3.00	2.60	2.60	2.60	2.60	2.60	2.60
2	Glibenclamide 5 mg	10 tabs	4.05	5.00	4.05	4.05	5.05	4.05	4.05	4.05
3	Gliclazide 40 mg	10 tabs	11.93	12.00	11.93	11.93	40.0	11.93	10.54	10.54
4	Gliclazide 80 mg	10 tabs	20.25	17.0	16.86	20.25	16.86	16.86	NA	16.86
5	Glimeperide 1mg	10 tabs	3.80	5.00	4.38	3.80	4.38	4.38	5.00	4.38
6	Glimeperide 2mg	10 tabs	5.05	7.00	5.05	5.05	5.05	5.05	5.05	5.05
7	Glipizide 5 mg	10 tabs	2.50	3.00	2.5	2.50	2.50	2.50	NA	2.50
8	Metformin Hydrochloride SR 1000 mg	10 tabs	11.05	11.50	11.05	11.05	11.05	11.05	NA	11.05
9	Metformin Hydrochloride SR 500 mg	10 tabs	8.85	12.00	8.85	8.85	8.85	8.85	10.0	8.85
10	Pioglitazone 15 mg	10 tabs	6.75	NA*	11.70	6.75	20.0	11.7	10.0	

11	Pioglitazone I.P. 30 mg	10 tabs	10.69	12.0	11.55	10.69	18.55	11.55	11.0	11.55
12	VogliboseIP 0.2 mg	10 tabs	9.61	10.0	9.61	9.61		9.61	9.61	
13	VogliboseIP 0.3 mg	10 tabs	9.92	10.00	9.92	9.92	12.34	9.92	9.92	9.92
14	Gliclizide 60 mg	10 tabs	37.62	NA	32.00	37.62		37.65	20.00	
15	Acarbose IP 50 MG	10 tabs	55.90	63.00	62.80	55.90	62.80	62.80	62.82	62.80
16	Glimipride 3 mg	10 tabs	3.78	NA	3.78	3.78	3.78	3.78	3.78	3.70
17	Glimipride 4 mg	10 tabs	4.37	NA	4.37	4.37	4.37	4.37	4.37	4.37
18	Metformin SRIP 850mg	10 tabs	12.38	NA	12.00	12.38	NA	12.38	NA	NA
19	Teneliglipti n Film coated 20mg	10 tabs	49.50	NA	64.21	64.20	69.00	64.21	65.00	NA
20	Metformin (SR) 500mg + Pioglitazone 15 mg	10 tabs	13.97	NA	NA	13.97	13.97	13.97	13.97	NA
21	Glipizide5 mg + Metformin Hydrochlor ide500 mg	10 tabs	6.80	NA	NA	6.80	NA	6.80	NA	NA
22	Gliclazide80 mg + Metformin Hydrochlor ide 500 mg	10 tabs	32.06	32.06	32.06	32.05	33.00	32.06	32.00	32.06
23	Glimepirid e2 mg + Metformin 500 mg SR	10 tabs	17.78	12.00	17.51	29.70	27.00	12.00	12.00	NA
24	Glimepirid e 1mg +Metformi n 500mg	10 tabs	6.73	7.00	6.73	6.73	20.00	6.73	14.00	18.00
25	Voglibose 0.2mg +Metformi n 500mg	10 tabs	13.97	NA	NA	13.97	22.00	21.71	21.71	NA
26	Voglibose 0.3 mg+Metfor min 500mg	10 tabs	19.89	17.28	17.28	19.89		17.28	25.27	NA

27	Insulin Glargine 100 IU Injections	3ml	118.61	NA	NOT IN STOCK	200.00	NA		NA	NA
28	Biphasic Isophane Insulin Injection IP 4O IU/ML (50:50)	10 ml	67.00	NA	NOT IN STOCK	67.00	NA		NA	NA
29	Insulin Injection IP 40 IU/ml (Insulin Human Recombinant)	10 ml Vial	200.00	NA	NOT IN STOCK	118.61	NA	118.61	NA	NA
* NA- Not Available										

In Table-5, the price variations of some anti-diabetes medicines is found between the PMBJKs stores themselves with the price given on the PMBJP website. Four medicines in single generics for diabetes have price discrimination across the stores. It is also found that Gliclazide 40 mg is available in one of the stores at a price which is 235.28% more than the price given in the PMBJP website. Again for Gliclizide 60 mg, two stores quoted lower rates than the price given in the website and it is available as low as 14.93% and 46.84% lower price in respective stores. Two medicines namely Glimperide 2 mg + Metformin 500 mg and Voglibose 0.3 mg+Metformin 500mg in combination generics are available in 3 stores at lower rates than the rates given in the website. Glimperide 2 mg + Metformin 500 mg is available at 32.50% lower price and Voglibose 0.3 mg+Metformin 500mg is available at 13.12% lower price. Also, two stores quoted Glimperide 2 mg + Metformin 500 mg at a 67.04% and 51.85% higher price than the price given in PMBJP website. One store quoted Voglibose 0.3 mg+Metformin 500mg at a 27.05% higher price than the price given in PMBJP website.

This study found that insulin, which is one of the most-used injections for anti-diabetic treatment, is also available at 40.69% cheaper rate than the PMBJP website price list in two stores.

It was also found that anti-diabetic injections were mostly not available at the stores when the data was collected.

Table-6 Price list of Cancer medicines available across PMBJKs in Mumbai and Thane regions

Sl. No.	Name of the drug	Package Unit	MRP PMBJP	MRP Store-1	MRP Store-2	MRP Store-3	MRP Store-4
1	Doxorubicin 10 mg Inj. IP	Vial	76.49	NA	76.49 *(NA)	58.9.00 (NA)	76.49
2	Doxorubicin 50 mg Inj. IP	Vial	250.47	NA	250.47 (NA)		250.47
3	Gemcitabine 1000 mg Inj. IP	Vial	631.21	NA	631.21 (NA)	589.20	631.21
4	Gemcitabine 200 mg Inj. IP	Vial	154.49	NA	154.49 (NA)	NA	154.49
5	Bortezomib Injection 3.5 mg	Vial	3188.00	NA	3188.00 (NA)	NA	3188.00
6	Oxaliplatin Injections 50mg	Vial	430.00	NA	430.00 (NA)	NA	430.00
7	Paclitaxel Injection 100mg	Vial	540.00	NA	540.00(NA)	NA	540.00
8	Tamoxifen Citrate Tablets I.P. strength 10 mg	10 tabs	9.56	NA	9.56(NA)	8.49 (NA)	9.56
9	Tamoxifen Citrate Tablets I.P. strength 20 mg	10 tabs	13.50	12.89	13.50 (NA)	12.89	13.50
10	Bicalutamide Tab I.P 50mg	10 tabs	137.50	NA	137.50 (NA)		137.50
* NA- Not Available							

It is to be noted that only three out of seven stores in Table-6 could provide with anti-cancer price list. Also, supply of those medicines is very poor. Even in cases where the medicines are available, price difference is found with the price list given in the website. One store quoted a 23% lower price for Doxorubicin 10 mg and 6.65% lower price for Gemcitabine 1000 mg than the given price list. Two stores quoted lower price for Tamoxifen Citrate 20mg than the price given on the website though it's minimal but it exists. It is also found that the supply of anti-cancer medicines under PMBJP scheme in various stores is very low when the data was collected.

Discussion

As mentioned in another study on the cost-effectiveness of generics of three commonly used medicines, availability of lower-priced medicines in the branded market was a matter of concern for schemes like PMBJP [15]. In this study it was found that some of the medicines are available at a lower price than the PMBJP scheme in the branded market for the treatment of diabetes and cancer. It denies the prime objective of reducing the burden of OOP expenditure on medicines of the households. Another important finding of this study is the number of drugs listed in the NLEM-2015 is poor especially for diabetes.

In India, most of the drugs are generics as they are off-patented. Branded generics are promoted and marketed well and are available at a higher price. Whereas in PMBJKs, unbranded low priced generic drugs are available. However, due to lack of awareness amongst patients and reluctance of the physicians to prescribe such low-priced drugs, people buy expensive branded medicines from private pharmacies, which eventually increases the OOP expenditures on medicines. It is also mentioned in one of the studies that quality-wise there is no difference between generic drugs available in PMBJPKs with its branded counterpart though only four commonly used drugs have been tested [14]. Hence, the prevalence of mistaken notions about the quality of generic drugs in these stores among the public and the physicians both can be addressed through proper awareness and advocacy. It has been estimated that switching to the procurement of generic drugs can save up to 60% of the cost in 17 developing countries. In Europe, generic substitution is mandatory in countries like Sweden, Germany, Norway, Spain, Finland and France [18].

In the US, generic substitution is a common practice by the physicians and the pharmacists and it is constantly monitored by the government agencies about prescribing and using generic drugs. In one of the studies it is mentioned that in India prescription of generic drugs is in a very dismal range of 3% to 20% [19]. In India, prescription audit by the government agencies for both public sector and the private sector is required to increase the access to low-priced generic medicines and thus reduce the OOP expenditure on medicines.

As per the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002, Code of Medical Ethics 1.5, “every physician should, as far as possible, prescribe drugs with generic names and he / she shall ensure that there is a rational prescription and use of drugs”. However, in India due to the promotion of branded medicines by the pharmaceutical companies, pharmacists have a tendency of replacing low-cost generic drugs by high-cost branded medicines in their outlets which forces patients to go for costly branded medicines even though they are being prescribed low-cost generic drugs[3].

In the UK generic substitution is a standard practice and prescribing generic medicines has been made a part of medical training by the medical schools [20]. In India it is the call of the hour to make such a scheme successful and create more awareness among the physicians first which will percolate to the patients as well to the pharmacists.

Awareness about this scheme among the physicians of a tertiary care teaching hospital in South India, as one study mentioned, is only 45.2% compared to their knowledge about bioequivalence of generic medicines (76.7 %) and the awareness about Council (Professional

Conduct, Etiquette and Ethics) Regulations, 2002 [21]. This also reflects the dismal performance of this scheme. Training programmes for the pharmacists/retailers are required to create awareness about generic drugs and also chemical names of such drugs. It should be ensured that physicians prescribe these low cost medicines through strict prescription audits.

Though the procurement price of essential medicines in India is lower than the average International Reference Pricing (IRP), the availability of these drugs in the public sector has always been a problem [19]. The mixed purchase model as mentioned by one of the studies can be followed with multiple vendors to get the most favourable pricing by making it more competitive. Another study also mentioned about the pooled procurement mechanism to bring down the price of the medicines [22]. This is also noted during the time of data collection in PMBJKs where availability of essential medicines especially for cancer treatment is problematic.

Another important observation is that in the NLEM-2015, Fixed Dose Combinations (FDCs) have not been included, though few anti-diabetic medicines under FDCs are available in the PMBJKs. Irrational use of FDCs has to be controlled by the continuous monitoring of its availability with the pharmacies and also by discouraging physicians from prescribing them unless it is unequivocally essential. Role of government agencies like Bureau of the Pharma PSUs of India (BPPI), National Pharmaceutical Pricing Authority of India (NPPAI) is very important in controlling such malpractices.

It is found that these stores also keep other medicines and not just PMBJP enlisted medicines which defies one of the guidelines stated in the booklet of Guidelines for Opening PMBJKs [23]. Medicines at a lower price than the price mentioned on the website was on offer by the stores. Hence, strict vigilance of the operation of such stores by the BPPI is required. Another important finding of this study is the non-availability of medicines for cancer treatment, hence constant follow-ups of the procurement process of cancer medicine in these store are required by the implementing agency.

Rigorous public awareness programme for cancer treatment such as those that exist for HIV treatment is required. Media campaigns about the scheme as well as about the bioequivalence of such medicines are required to create awareness among the population. Mostly video clips available are about the availability of such stores and availability of low cost generic medicines in these stores under this scheme [24]. However, media campaign on its bioequivalence of these medicines with the branded medicines should be the focus of the campaign.

This study shows that cheaper medicines are available in the market in comparison to the medicines available in PMBJKs. Hence, supply chain management or the procurement of medicines has to be more effective. As suggested by other studies also “pooled” procurement or “mixed” purchase system will bring down the medicine prices by a large margin. In other words, tendering process has to be more wide and open to reduce the cost as well as to increase the availability of these medicines in these stores. However, this study could not elaborate on this due to the lack of information from the stores regarding their tendering process. It is essential to make it more transparent to avoid any malpractices. The price discrepancies between the stores of some of the medicines are also a matter of concern. Strict monitoring by the BPPI is required on a regular basis. The main

focus of this scheme is to open at least one PMBJK in each district of the country as well as major towns and villages. However, due to the lack of quality healthcare facilities in public healthcare system in rural areas, people are forced to come to the cities to avail expensive private healthcare facilities especially for cancer treatment, hence it is essential to broaden the scope of opening such stores in the cities also. As a whole, visibility of these stores is essential to reach out to the masses and thus it is required that more such stores are opened, also private-public model can be followed to maximise the availability, affordability and accessibility of such low-cost medicines especially medicines for diabetes and cancer treatments in a country where these disease are so prevalent.

Sustainability of these stores has to be taken care of to encourage more people into this business. In a country like India where health insurance, including private and public, does not have a wide penetration, moreover it doesn't cover the cost of medicines, it is important for this scheme to have a wider approach to reach out to every economically weaker section of the country to reduce the burden of the disease.

Recommendations

This study recommends a more effective impact of this scheme to reduce the OOP expenditure on medicines in India. First, proper tendering and procurement process has to be followed to reduce the cost of medicines as well as to increase the availability of medicines especially for cancer treatment. Second, more such stores have to be opened in local areas rather than mostly in the periphery of a hospital to compete with the private stores. Thirdly, as in this study, discrepancy between the JAS website price with the price list of various stores has been found, strict monitoring and auditing are recommended to control/curb such practices. Finally, continuous media campaigns in all formats including on social media about the existence of such stores and bioequivalence of these medicines should be conducted by the government to create awareness among the general public.

Ethical Approvals

Not Applicable

Conflict of Interest

Not Applicable

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