

Pharmacoeconomic Analysis of Treating Lung Cancer with Different Regimens Using the Cheapest and Costliest Brand and the Generic Jan Aushadhi Drugs Marketed in India

Abhishek Krishna¹ Princy Louis Palatty² Thomas George³ Manjeshwar Shrinath Baliga⁴

¹Department of Radiation Oncology, Mysore Medical College and Research Institute, Mysuru, Karnataka, India

²Department of Pharmacology, Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeetham, Ernakulam, Kerala, India

³Department of Internal Medicine, Coney Island Hospital, Brooklyn, New York, United States

⁴Research Unit, Mangalore Institute of Oncology, Pumpwell, Mangaluru, Karnataka, India

Address for correspondence Manjeshwar Shrinath Baliga, MSc, PhD, Department of Radiobiology and Research, Mangalore Institute of Oncology, Mangaluru 75002, Karnataka, India
(e-mail: msbaliga@gmail.com; msbaliga.mio@gmail.com).

Ind J Med Paediatr Oncol 2024;45:176–182.

Abstract

Background/Purpose of the Study The costs of chemotherapy drugs which are vital in the treatment of lung cancer can be exorbitant. The current study was undertaken to ascertain cost minimization analysis by comparing costliest and cheapest branded with Jan Aushadhi (JA) drugs marketed in India.

Methods The cost of costliest, cheapest branded, and JA drugs were collected from the designated reference sites. The cost difference, cost ratio, and percentage of cost variation were calculated as per cost minimization study guidelines.

Results The results of the analysis suggest that the JA drugs were much cheaper than the branded drugs and when used in regimens resulted in substantial cost savings. The biggest financial advantage was seen in the commonly used cisplatin–pemetrexed regimen where cost saving of Rs. 268,002 was observed for the whole treatment of six cycles. Using JA drugs also reduced the cost for the targeted therapy with gefitinib and erlotinib.

Conclusion The cost minimization study, which is the first in this field of lung cancer, clearly indicates the usefulness of JA drugs in reducing financial costs for the patient.

Keywords

- lung cancer
- anticancer drugs
- pharmacoeconomics
- Jan Aushadhi
- cost difference
- cost ratio
- percentage of cost variation

Introduction

Chemotherapy is important in lung cancer treatment, and depending on the stage, it is used either as the only modality or before or after surgery or radiation.¹ However, chemotherapy costs patient substantially and liquidates their lifelong earnings/savings. In hospital pharmacy, cost minimization analysis (CMA) is important aspect and attempts at under-

standing the financial impact of drug costs on the patient considering different marketed brands. The Government of India has initiated Jan Aushadhi (JA) outlets across the country where generic drugs are available at reduced price and has been immensely useful for the poor.² The current study compared the CMA taking into account the most expensive and least expensive branded anticancer drugs with the JA drugs. By assessing the economics of chemotherapy drugs, the

study aims to provide insights into optimizing health care budgets and promoting the adoption of economically viable treatment options.

Materials and Methods

Inclusion and Exclusion Criteria

The inclusion criteria considered were to include only those drugs and regimens used in the curative or palliative lung cancer treatment, in accordance to National Comprehensive Cancer Network guidelines. The exclusion criteria included all other drugs and regimen used for treating other cancers.

Study Method

This CMA was performed in accordance to the tenets of pharmacy and health economics research guidelines from October to December 2021. The study evaluated the cost disparities between the costliest and cheapest drugs under the premise that all other costs associated with the delivery of treatment remained constant. Costs of the branded anticancer drugs available in India were obtained from the Current Index of Medical Specialties and the Monthly Index of Medical Specialties, India. JA drug costs were ascertained from the booklet available and from the Pharmaceuticals and Medical Devices Bureau of India. Cost difference, cost ratio, and percentage of cost variation were calculated per tablet/capsule/injection as described earlier.³

Anticancer drugs have to be strictly administered considering the body surface area (BSA) of the patient. Bearing this in mind, for this study, the dose and the financial cost for treating lung cancer were estimated adopting the recent National Institute of Nutrition, Hyderabad, India details on average height and weight for Indian men and women. The values of 55 kg and 5.3 feet (162 cm) tall for Indian woman and 65 kg and 5.8 feet (177 cm) tall for Indian man were considered.⁴ BSA was calculated and observed to be 1.58 for women and 1.78 for men. For carboplatin, which needs to be provided based on the patient's glomerular filtration rate (GFR) and creatinine clearance, the value of 0.7 for creatinine was considered.⁵ The cost for both males and females was calculated for the various regimens for one cycle as well as for six cycles and represented in tables. The primary outcome of the study was to evaluate the cost disparities between the costliest and cheapest chemotherapy drugs used in the treatment of lung cancer.

Results

The cost of the individual JA, costly, and cheap branded anticancer drugs marketed in India is presented in ►Table 1. The highest cost saving was observed by replacing branded with JA drug for the commonly used cisplatin–pemetrexed regimen, where saving of Rs. 268,002 was observed (►Tables 2 and 3). The cost savings for other regimens are presented in ►Tables 2 and 3 for males

Table 1 Cost of JA, costly, and cheap branded anticancer drugs marketed in India

Generic name (dose) Tablet/strip or mg/vial		Cost of the single tablet/unit in INR		
		JA	Costly	Cheap
Carboplatin Inj. 150 mg/15 mL		375.00	1,485.00	678.07
Carboplatin Inj. 450 mg/45 mL		1,707.00	3,795.00	2,330.00
Cisplatin	Inj. 50 mg/50 mL vial	156.00	635.00	309.52.00
	Inj. 10 mg/vial	32.00	192.00	63.09
Docetaxel	Inj. 20 mg/mL	Not available	6,500.00	765.00
	Inj. 80 mg/2 mL	1,800.00	13,541.70	1,290.00
	Inj. 120 mg/3 mL	2,700.00	19,750.00	2,325.00
Erlotinib tablet 150 mg (10 tablets)		70.00	541.70	3,545.00
Etoposide Inj. 100 mg/5 mL		76.00	196.00	182.00
Gemcitabine	Inj. 1,000 mg/vial	836.00	6,836.00	4,722.13
	Inj. 200 mg/vial	240.00	1,512.00	468.50
Gefitinib tablet 250 mg (10 tablets)		44.00	1,320	127.60
Paclitaxel Inj. 260 mg/43.4 mL		Not available	13,492.5	7,408.00
Paclitaxel Inj. 30 mg/5 mL		Not available	1,909.00	423.00
Paclitaxel Inj. 100 mg/16.7 mL		540.00	8,076.00	3,162.00
Pemetrexed 500 mg		2,310.00	30,000.00	2,442.00
Pemetrexed 100 mg		810.00	5,950.00	880.00
Vinorelbine 50 mg/5 mL		Not available	16,000.00	4,352.5

Abbreviation: JA, Jan Aushadhi.

Table 2 Details of cost per cycle and the whole regimen for different chemotherapy regimens used to treat lung cancers in Indian males

Regimen name Drugs (mg/m ²)	Male per dose				Male total dose calculation				Fold difference				PCV			
	Dosage required	Cheap	Costly	JA	Cheap	Costly	JA	Costly/ cheap	Costly/ JA	Cheap/ JA	Costly/ cheap	Costly – JA	Costly – cheap	Cheap – JA		
Weekly cisplatin 40 mg/m ²) cost for one cycle	71.2	498.52	1,211	252	498.52	1,211	252	2.4	4.8	2	712.5	959	246.5	142.9	380.6	
Final cost (six cycles)					2,991.12	7,266	1,512	2.4	4.8	2	4,274.9	5,754	1,479.1	142.9	380.6	
Weekly carboplatin (AUC 2) for one cycle	220	1,355.14	2,970	750	1,355.14	2,970	750	2.2	4	1.8	1,614.9	2,220	605.1	119.2	296	
Final cost (six cycles)					8,130.84	17,820	4,500	2.2	4	1.8	9,689.2	13,320	3,630.8	119.2	296	
Cisplatin–docetaxel	133.5	3,090	26,250	3,600		26,250	3,600	8.5	7.3	0.9	23,160	22,650	-510	749.5	629.2	
Docetaxel (75 mg/m ²) + cisplatin (75 mg/m ²)	133.5	928.5	1,905	468	928.5	1,905	468	2.1	4.1	2	976.5	1,437	460.5	105.2	307.1	
Total for one cycle					4,018.5	28,155	4,068	7	6.9	1	24,136.5	24,087	-49.5	600.6	592.1	
Final cost for six cycles					24,111	168,930	24,408	7	6.9	1	144,819	144,522	-297	600.6	592.1	
Cisplatin–paclitaxel	311.5	8,254.25	17,311.5	2,160		8,254.25	17,311.5	2,160	2.1	8	3.8	9,057.3	15,151.5	6,094.3	109.7	282.1
Paclitaxel (175 mg/m ²) + cisplatin (100 mg/m ²)	178	1,238.08	2,540	624	1,238.08	2,540	624	2.1	4.1	2	1,301.9	1,916	614.1	105.2	307.1	
Total for one cycle					9,492.33	19,851.5	2,784	2.1	7.1	3.4	10,359.2	17,067.5	6,708.3	109.1	241	
Final cost six cycles					56,953.98	119,109	16,704	2.1	7.1	3.4	62,155	102,405	40,250	109.1	613.1	
Pacitaxel carboplatin	311.5	8,254.25	17,311.5	2,160		8,254.25	17,311.5	2,160	2.1	8	3.8	9,057.3	15,151.5	6,094.3	109.7	282.1
Paclitaxel (175 mg/m ²) + carboplatin (AUC 6)	650	3,686.14	6,765	2,457	3,686.14	6,765	2,457	1.8	2.8	1.5	3,078.9	4,308	1,229.1	83.5	175.3	
Total for one cycle					11,940.39	24,076.5	4,617	2	5.2	2.6	12,136.1	19,459.5	7,323.4	101.6	421.5	
Final cost (six cycles)					71,642.34	144,459	27,702	2	5.2	2.6	72,816.7	116,757	43,940.3	101.6	421.5	
Gemcitabine–cisplatin	142.4	928.5	1,905	468	928.5	1,905	468	2.1	4.1	2	976.5	1,437	460.5	105.2	307.1	
Cisplatin (80 mg/m ²) + gemcitabine (1,000 mg/m ²)	1,780	6,596.13	12,884	1,796	6,596.13	12,884	1,796	2	7.2	3.7	6,287.9	11,088	4,800.1	95.3	617.4	
Gemcitabine D1 + D8					13,192.26	25,768	3,592	2	7.2	3.7	12,575.7	22,176	9,600.3	95.3	617.4	
Total for one cycle					14,120.76	27,673	4,060	2	6.8	3.5	13,552.2	23,613	10,060.8	96	581.6	
Final cost (six cycles)					84,724.56	166,038	24,360	2	6.8	3.5	81,313.4	141,678	60,364.6	96	581.6	
Cisplatin–vinorelbine	178	1,238.08	2,540			1,238.08	2,540		2.1	0	0	1,301.9	2,540	1,238.1	105.2	0
Cisplatin (100 mg/m ²) + vinorelbine (25 mg/m ²)	44.5	4,352.5	16,000	4,352.5	16,000	4,352.5	16,000	3.7	0	0	11,647.5	16,000	4,352.5	267.6	0	
Vinorelbine D1, 8, 15, 22					17,410	64,000		3.7	0	0	46,590	64,000	17,410	267.6	0	
Total for one cycle					18,648.08	66,540		3.6	0	0	47,891.9	66,540	18,648.1	256.8	0	
Final cost for four cycles					74,592.32	266,160		3.6	0	0	191,567.7	266,160	74,592.3	256.8	0	
Cisplatin–etoposide	178	1,238.08	2,540	624	1,238.08	2,540	624	2.1	4.1	2	1,301.9	1,916	614.1	105.2	307.1	
Cisplatin (100 mg/m ²) + etoposide (100 mg/m ²)	178	394	596	198	394	596	198	1.5	3	2	202	398	196	51.3	201	
Etoposide D1, 2, 3					1,182	1,788	594	1.5	3	2	606	1,194	588	51.3	201	
Total for one cycle					2,420.08	4,328	1,218	1.8	3.6	2	1,907.9	3,110	1,202.1	78.8	255.3	
Final cost for four cycles					9,680.32	17,312	4,872	1.8	3.6	2	7,631.7	12,440	4,808.3	78.8	255.3	

Table 2 (Continued)

Regimen name Drugs (mg/m ²)	Male		Male per dose			Male total dose calculation			Fold difference			Difference			PCV	
	Dosage required	Cheap	Costly	JA	Cheap	Costly	JA	Costly/cheap	Costly/ JA	Cheap/ JA	Costly/cheap	Costly/ JA	Cheap/ JA	Costly – JA		
Pacitaxel (175 mg/m ²)	311.5	8,254.25	17,311.5	2,160	8,254.25	17,311.5	2,160	2.1	8	3.8	9,057.3	15,151.5	6,094.3	109.7	701.5	
Final cost for six cycles															282.1	
Docetaxel (75 mg/m ²)	133.5	3,090	26,250	3,600	3,090	26,250	3,600	22,650	-510	23,160	7.3	0.9	8.5	729.2	-14.2	
Final cost for six cycles															749.5	
Gemcitabine (1,000 mg/m ²)	1,780	6,596.13	12,884	1,796	18,540	157,500	21,600	-3,060	138,960	7.3	0.9	8.5	729.2	-14.2	749.5	
Total for one cycle (D1, 8, 15)															95.3	
Final cost (six cycles)															95.3	
Cisplatin–pemetrexed	890	4,884	4,884	53,800	4,884	47,850	4,620	9.8	10.4	1.1	42,966	43,230	264	879.7	935.7	5.7
Pemetrexed (500 mg/m ²) + cisplatin (75 mg/m ²)	133.5	117.75	928.5	1,905	928.5	1,905	468	2.1	4.1	2	976.5	1,437	460.5	105.2	307.1	98.4
Total for one cycle																
Final cost for six cycles																

Abbreviations: AUC, area under the curve; D, day; JA, Jan Aushadhi; PCV, percentage of cost variation.

and females, respectively. The CMA conducted for a 1-year course of the targeted therapy drugs gefitinib and erlotinib showed that JA drug resulted in substantial cost savings when compared with its branded counterparts (**►Table 4**).

Discussion

The cost of chemotherapy varies according to the type and stage of lung cancer, and the anticancer drug and the regimen being planned, and imposes severe financial burden on the patients.⁶ The results indicate that the costs for drugs with the same strength vary and that generic JA medications are cheaper than the branded drugs (**►Table 1**).⁷ In clinics, pemetrexed, which is usually used with cisplatin or carboplatin, is a first-line, maintenance, and second- or third-line treatment for non-small cell lung cancer (NSCLC),⁸ and substitution with a JA drug results in a significant cost reduction for both male and female patients (**►Tables 2** and **3**). A substantial saving was also observed in the CMA for cisplatin–etoposide, gemcitabine–cisplatin, and other regimens when JA drugs were used (**►Tables 2** and **3**).

In recent years, inhibiting Epidermal Growth Factor Receptor (EGFR), which is overexpressed in 10 to 15% of NSCLC patients, is observed to be effective, and the drugs erlotinib, gefitinib, afatinib, and osimertinib are reported to be effective.^{9,10} Erlotinib and gefitinib work by blocking the EGFR tyrosine kinase domain through competitive linking at the adenosine triphosphate-binding site.¹⁰ The use of JA drugs resulted in significant cost savings for patients. Lung cancer chemotherapy poses a significant financial challenge, particularly in resource-constrained nations such as India. The overall cost encompasses expenses related to drugs, medical equipment, and hospital stays, placing a substantial burden on patients. For individuals grappling with lung cancer, out-of-pocket expenditures manifest at every stage, spanning initial visits to local health facilities to ultimate diagnosis and treatment at tertiary health care centers. The financial strain is evident in expenses incurred for preliminary investigations, diagnostic tests, and the unavoidable costs associated with travel and accommodation during referrals to higher tier health care facilities. To alleviate the financial strain, the widespread establishment of JA stores, particularly in rural areas, holds promise for assisting economically disadvantaged populations. The same could facilitate the realization of reduced drug prices, aligning with the aspiration for more affordable health care. Instituting social safety nets for marginalized communities stands to enhance accessibility to essential and quality pharmaceuticals. Essential improvements in pharmaceutical policies at both national and state levels are imperative to amplify cost-effectiveness, thereby widening public access to chemotherapy medications.

Conclusion

The observations of the study indicate that the prices of treating lung cancer were decreased, when JA anticancer drugs were used. The findings of the study will be of

Table 3 Details of cost per cycle and the whole regimen for different chemotherapy regimens used to treat lung cancers in Indian females

Regimen name Drugs (mg/m ²)	Female per dose				Female total dose calculation				Fold difference		Difference		PCV			
	Dosage required	Cheap	Costly	JA	Cheap	Costly	JA	Costly/ cheap	Costly/JA	Cheap/ JA	Costly/ cheap	Costly/ JA	Cheap – JA			
Weekly Cisplatin (40 mg/m ²) cost for one cycle	62.8	435.52	1,019	220	435.52	1,019	220	2.3	4.6	2	583.5	799	215.5	134	363.2	98
Final cost (six cycles)					2,613.12	6,114	1,320	2.3	4.6	2	3,500.9	4,794	1,293.1	134	363.2	98
Weekly carboplatin (AUC 2)	170	1,355.14	2,970	750	1,355.14	2,970	750	2.2	4	1.8	1,614.9	2,220	605.1	119.2	296	80.7
Final cost (six cycles)					8,130.84	17,820	4,500	2.2	4	1.8	9,689.2	13,320	3,630.8	119.2	296	80.7
Cisplatin–docetaxel	117.75	2,325	19,750	2,700	2,325	19,750	2,700	8.5	7.3	0.9	17,425	17,050	–375	749.5	631.5	–13.9
Docetaxel (75 mg/m ²) + cisplatin (75 mg/m ²)	117.75	928.5	1,905	468	928.5	1,905	468	2.1	4.1	2	976.5	1,437	460.5	105.2	307.1	98.4
Total for one cycle					3,253.5	21,655	3,168	6.7	6.8	1	18,401.5	18,487	85.5	565.6	583.6	2.7
Final cost (six cycles)					19,521	129,930	19,008	6.7	6.8	1	110,409	110,922	513	565.6	583.6	2.7
Cisplatin–paclitaxel	274.75	7,831	15,402.5	1,620	7,831	15,402.5	1,620	2	9.5	4.8	7,571.5	13,782.5	6,211	96.7	850.8	383.4
Paclitaxel (175 mg/m ²) + cisplatin (100 mg/m ²)	157	1,238.08	2,540	624	1,238.08	2,540	624	2.1	4.1	2	1,301.9	1,916	614.1	105.2	307.1	98.4
Total for one cycle					9,069.08	17,942.5	2,244	2	8	4	8,873.4	15,698.5	6,825.1	97.8	699.6	304.1
Final cost (six cycles)					54,414.48	107,655	13,464	2	8	4	53,240.5	94,191	40,950.5	97.8	699.6	304.1
Paclitaxel carboplatin	274.75	7,831	15,402.5	1,620	7,831	15,402.5	1,620	2	9.5	4.8	7,571.5	13,782.5	6,211	96.7	850.8	383.4
Paclitaxel (175 mg/m ²) + carboplatin (AUC 6)	515	3,008	5,280	2,082	3,008	5,280	2,082	1.8	2.5	1.4	2,272	3,198	926	75.5	153.6	44.5
Total for one cycle					10,839	20,682.5	3,702	1.9	5.6	2.9	9,843.5	16,980.5	7,137	90.8	458.7	192.8
Cost for six cycles					65,024	124,095	22,212	1.9	5.6	2.9	59,061	101,883	42,822	90.8	458.7	192.8
Gemcitabine–cisplatin	125.6	928.5	1,905	468	928.5	1,905	468	2.1	4.1	2	976.5	1,437	460.5	105.2	307.1	98.4
Cisplatin (80 mg/m ²) + gemcitabine (1,000 mg/m ²)	1,570	6,127.63	11,372	1,556	6,127.63	11,372	1,556	1.9	7.3	3.9	5,244.4	9,816	4,571.6	85.6	630.8	293.8
Gemcitabine D1 + D8					12,255.26	22,744	3,112	1.9	7.3	3.9	10,488.7	19,632	9,143.3	85.6	630.8	293.8
Total for one cycle					13,183.76	24,649	3,580	1.9	6.9	3.7	11,465.2	21,069	9,603.8	87	588.5	268.3
Final cost (six cycles)					79,102.56	147,894	21,480	1.9	6.9	3.7	68,791.4	126,414	57,622.6	87	588.5	268.3
Cisplatin–vinorelbine	157	1,238.08	2,540	1,238.08	2,540	16,000	3,7				1,301.9	2,540	1,238.1	105.2		
Cisplatin (100 mg/m ²) + vinorelbine (25 mg/m ²)	39.25	4,352.5	16,000	4,352.5	16,000	3,7					11,647.5	16,000	4,352.5	267.6		
Vinorelbine D1, 8, 15, 22					17,410	64,000	3.7				46,590	64,000	17,410	267.6		
Total for one cycle					18,648.08	66,540	3.6				47,891.9	66,540	18,648.1	256.8		

Table 3 (Continued)

Regimen name Drugs (mg/m^2)	Female Dosage required	Female per dose Cheap	Female per dose Costly	JA Cheap	JA Costly	Female total dose calculation Costly/cheap	Fold difference Costly/JA	Difference Costly/cheap	PCV Costly – JA	Costly – cheap	Costly – JA	Cheap – JA
Final cost (one cycles)												
Cisplatin–etoposide	157	1,238.08	2,540	624	74,592.32	266,160	3.6		191,567.7	266,160	74,592.3	256.8
Cisplatin ($100 \text{ mg}/\text{m}^2$) + etoposide ($100 \text{ mg}/\text{m}^2$)	157	394	596	394	1,238.08	2,540	624	2.1	1,301.9	1,916	614.1	105.2
Etoposide D1, 2, 3												
Total for one cycle												
Final cost (four cycles)												
Paclitaxel ($175 \text{ mg}/\text{m}^2$) cost for one cycle	274.75	7,831	15,402.5	1,620	7,831	15,402.5	1,620	2	9.5	4.8	7,571.5	13,782.5
Final cost for six cycles												
Docetaxel ($75 \text{ mg}/\text{m}^2$) cost for one cycle	117.75	2,325	19,750	2,700	2,325	19,750	2,700	8.5	9.5	4.8	45,429	82,695
Final cost (six cycles)												
Gemcitabine ($1,000 \text{ mg}/\text{m}^2$)	1,570	6,127.63	11,372	1,556	6,127.63	11,372	1,556	1.9	7.3	0.9	17,425	17,050
Total for one cycle (D1, 8, 15)												
Final cost (six cycles)												
Pemetrexed–displatin (500 mg/m^2) + cisplatin (75 mg/m^2)	785	4,884	47,850	4,620	4,884	47,850	4,620	9.8	10.4	1.1	42,966	43,230
Total for one cycle												
Final cost (six cycles)												

Abbreviations: AUC, area under the curve; D, day; JA, Jan Aushadhi; PCV, percentage of cost variation.

Table 4 Details of cost for gefitinib and erlotinib treatment for 1 month and a year using JA, costly, and cheap branded drugs

		Male per dose				Male total dose calculation				Fold difference				Difference				PCV	
		Cheap	Costly	JA	Cheap	Costly	JA	Cheap	Costly	JA	Cheap	Costly	JA	Cheap	Costly	JA	Cheap	Costly	JA
Gefitinib tablet (250 mg stat od)	For 1 d	127.6	1,320	44	127.6	1,320	44	10.3	10.3	30	2.9	1,192.4	1,276	83.6	934.5	2,900			
	For 1 mo				3,828	39,600	1,320	10.3	30	2.9	35,772	38,280	2,508	934.5	2,900	190			
	Final cost for 1 y		45,936	475,200	15,840	10.3	30	2.9	429,264	459,360	30,096	934.5	2,900	190					
Erlotinib tablet (100 mg stat od)	For 1 d	541.7	3,545	70	541.7	3,545	70	6.5	6.5	50.6	7.7	3,003.3	3,475	471.7	554.4	4,964.3			
	For 1 mo				16,251	106,350	2,100	6.5	50.6	7.7	90,099	104,250	14,151	554.4	4,964.3	673.9			
	Final cost for 1 y		195,012	1,276,200	25,200	6.5	50.6	7.7	1,081,188	1,251,000	169,812	1,251,000	169,812	554.4	4,964.3	673.9			

Abbreviations: JA, Jan Aushadhi; PCV, percentage of cost variation.

tremendous value to the patient population, the health care fraternity, and the society at large.

Ethics

No patient-specific data or information were required for the study focus on the pharmacoeconomics of drug pricing. Cost of data on medications is available in public domain, and the study did not require approval from an Institutional Review Board.

Ethics Committee Approval

Not required.

Source of Funding

None declared.

Conflict of Interest

None declared.

References

- 1 Noronha V, Pinninti R, Patil VM, Joshi A, Prabhash K. Lung cancer in the Indian subcontinent. *South Asian J Cancer* 2016;5(03): 95–103
- 2 Kolasani BP, Malathi DC, Ponnaluri RR. Variation of cost among anti-cancer drugs available in Indian market. *J Clin Diagn Res* 2016;10(11):FC17–FC20
- 3 Kashyap A, Balaji MN, Chhabra M, Rashid M, Muragundi PM. Cost analysis of various branded versus generic chemotherapeutic agents used for the treatment of early breast cancer- a deep insight from India. *Expert Rev Pharmacoecon Outcomes Res* 2020; 20(04):355–361
- 4 National Institute of Nutrition. India n.d. Accessed September 30, 2022, at: https://www.nin.res.in/RDA_short_Report_2020.html
- 5 Chandran S, Rao S, Prasad KR, et al. Alterations in hematological, liver and renal parameter levels in people afflicted with lung cancer. *Int J Medical Laboratory Research*. 2019;4(01):30–34
- 6 Singh N, Agrawal S, Jiwnani S, Khosla D, Malik PS, Mohan A, et al. Editorial: Lung Cancer Worldwide. Lung Cancer in India. *J Thorac Oncol* 2021;16(08):1250–1266
- 7 George T, Baliga MS. Generic anticancer drugs of the Jan Aushadhi scheme in India and their branded counterparts: the first cost comparison study. *Cureus* 2021;13(11):e19231
- 8 Scagliotti GV, Parikh P, von Pawel J, et al. Phase III study comparing cisplatin plus gemcitabine with cisplatin plus pemetrexed in chemotherapy-naïve patients with advanced-stage non-small-cell lung cancer. *J Clin Oncol* 2008;26(21):3543–3551
- 9 Lynch TJ, Bell DW, Sordella R, et al. Activating mutations in the epidermal growth factor receptor underlying responsiveness of non-small-cell lung cancer to gefitinib. *N Engl J Med* 2004;350 (21):2129–2139
- 10 Johnson M, Garassino MC, Mok T, Mitsudomi T. Treatment strategies and outcomes for patients with EGFR-mutant non-small cell lung cancer resistant to EGFR tyrosine kinase inhibitors: focus on novel therapies. *Lung Cancer* 2022;170:41–51