

## Research Article



## Cost Analysis of Oral Antipsychotic Drugs Available in the Indian Market

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### ABSTRACT

Psychotic disorders are serious mental disorders, associated with significant personal distress, social disability & lifelong treatment. However, commonly used antipsychotic drugs are very expensive. There exists a wide variation in prices of drugs marketed in India and other countries of the world. The present study was aimed to represent the existing situation of availability and price variation by comparing data about brand availability and difference in pricing between various brands. Cost of a particular drug being manufactured by different companies, in the same strength, number per strip and dosage forms was analysed from 'Current Index Of Medical Specialities' (CIMS) July- October 2013 & 'Indian Drug Review'(IDR) September 2013. The difference in the maximum and minimum price of the same drug manufactured by different pharmaceutical companies and percentage variation in price was calculated. Percentage price variation of the commonly used drugs was as follows: Among atypical antipsychotics, Olanzapine (10mg) shows maximum price variation of 1136.8%, Clozapine (25 mg) shows variation of 79% while Amisulpride (300 mg) shows variation of 8.57%. Among conventional antipsychotics, Haloperidol (5mg) shows maximum price variation of 348 % while flupentixol (3mg) shows variation of 5.16%. Average percentage price variation of different brands of the same oral antipsychotic drug is very wide, maximum variation is seen with Olanzapine and minimum with Flupentixol. The appraisal & management of marketing of drugs should be directed toward maximizing benefits of therapy and minimizing negative personal & economic consequences. Prescribers and patients should be educated about drug prices.

**Keywords:** Anti-psychotic agents, Brands, Drug cost.

### INTRODUCTION

India produces around 8 per cent of the medicines available in the global market in terms of volume and ranks 13<sup>th</sup> in world production by value. Still sixty per cent of the population does not have access to medicines.<sup>1</sup> Most health care is provided by the private sector, which often causes high out-of-pocket health expenditure that leads to debt and impoverishment.<sup>2</sup> About 60-90 per cent of healthcare spending by poor people is on medicine. To compound the problem, there are more than 20,000 medicine formulations in the Indian market.<sup>3</sup> It is not humanly possible for even a well-informed, health care provider, to be aware about all these formulations. Due to this lack of information, it is the poor patient who has to bear the medical and economic consequences of these formulations.

Psychosis, a mental disorder, is characterized by radical changes in personality, impaired functioning, and distorted or non-existent sense of objective reality. Psychosis being a chronic disease, is associated with significant and long-lasting health, social and financial burdens, not only for patients but also for their families and other caregivers and with poor quality of life. Incidence of psychosis is higher in the 15-35 year-old age group (7 per 1,000 population).<sup>4-6</sup> Psychotic disorder (specially schizophrenia) is a highly incapacitating disease and choosing the most appropriate drug and formulation for a particular patient is crucial.<sup>7</sup> Management is expensive and less cost effective, so cost is a major deciding factor for patient compliance.

The Indian health sector has been affected by economic liberalization, structural adjustment reforms by the World Bank and increasing cost of production of pharmaceuticals. Increasing cost of medicines may be a reason for people not accessing health care.<sup>8</sup> Ignorance and insufficient knowledge of antipsychotic drug prices, makes it difficult for the physician to decide and prescribe most economical treatment regime. Hence, the study was designed to evaluate the cost of oral anti-psychotics of different generic classes and different brand names and to analyse price variation among various antipsychotics available in Indian market.

### MATERIALS AND METHODS

Current Index of Medical Specialities (CIMS) July - October 2013 & Indian Drug Review (IDR) September 2013 drug manuals were used to analyse the prices of antipsychotic drugs.

1. Cost of a particular drug (single drug or drug combinations) in the same strength, number & dosage forms being manufactured by different companies was compared.
2. The drugs manufactured by only one company or being manufactured by different companies however, in different strengths were excluded.
3. Parenteral formulations were excluded.
4. Difference between the maximum & minimum cost of same drug manufactured by different pharmaceutical companies was calculated.



The following formula was used to calculate price variation.<sup>9</sup>

### Percentage price variation =

$\frac{\text{Price of most expensive brand} - \text{Price of least expensive brand}}{\text{Price of least expensive brand}} \times 100$

Price of least expensive brand

Findings of our observational study were expressed as absolute numbers as well as percentage.

## RESULTS AND DISCUSSION

The prices of a total of 17 drugs (12 single and 5 combination preparations), available in 59 different formulations were analysed. These 59 formulations are manufactured by different pharmaceutical companies.

### Single drug therapy

Table I shows the price variation between atypical antipsychotics group of drugs. In this group, Olanzapine (10mg) shows maximum price variation of 1136.8%, while Amisulpride (300 mg) shows minimum price variation of 8.57%.

Table II shows price variation in phenothiazines groups of drugs. In these groups, chlorpromazine (25mg) shows maximum price variation of 300.5% & Thioridazone (10 mg) shows minimum price variation of 27% variation

Table III shows the price variation between Butyrophenones group of drugs. In this group, Haloperidol (0.25mg) shows maximum price variation of 665%, while flupentixol (3mg) shows minimum price variation of 5.16%

### Combination therapy

Table IV shows price variation between various combinations of antipsychotics. Total 5 combination therapies were analysed.

In this, Trifluoperazine + Trihexyphenidyl (1mg+2mg) combination shows maximum price variation of 342.07%, while Chlorpromazine + Trihexyphenidyl (100mg+2mg) shows minimum price variation of 11.02 %.

**Table 1:** Price variation in atypical antipsychotics group of drugs

Drug	Formulation	Doses (mg)	Number of Manufacturing companies	Min price (Rs)	Max. price (Rs)	% Price variation
Amisulpride	4	50	6	47.50	57	19.49
		100	6	77.40	92	18.86
		200	5	147	165	12.24
		300	3	210	228	8.57
Aripiprazole	5	5	4	32.50	41.40	27.38
		10	13	57.04	144	152.45
		15	13	80.05	195	143.59
		20	10	99	237	139.39
		30	11	139	177.35	27.59
Clozapine	3	25	10	15.90	28.50	79
		50	8	30	48	60
		100	10	50	76	52
Olanzapine	6	2.5	27	11	26	136.36
		5	40	9.5	240	1130.76
		7.5	25	28	61	117.85
		10	39	25	470	1136.8
		15	15	44	95	115.9
		20	10	80	112	40
Quetiapine	5	25	13	16	40	15.
		50	9	25	46	84
		100	17	40	103.90	159.75
		200	17	78	146.30	87.56
		300	5	105	146.30	39.33
Risperidone	4	1	15	6.82	135	237
		2	14	13.30	270	170
		3	10	20.10	405	118
		4	10	29.50	540	540
Ziprasidone	3	20	2	30.20	44.30	46.68
		40	2	59.90	89	48.58
		80	2	119.60	155	20.59



**Table 2:** Price variation in phenothiazines group of drugs

Drug	Formulation	Doses (mg)	Number of Manufacturing companies	Min price (Rs)	Max. price (Rs)	% Price variation
Chlorpromazine	4	25	5	1.79	7.14	300.5
		50	6	2.84	10.25	260
		100	6	5.06	13.96	175.88
		200	3	9.07	9.22	1.65
Thioridazone	4	10	4	9	11.45	27
		25	8	14.80	26.50	79
		50	5	32.25	43	33
		100	5	52	72.80	40
Trifluoperazine	2	1	2	3.60	6.88	91
		5	3	4.48	10	123

**Table 3:** Price variation in Butyrophenones group of drugs

Drug	Formulation	Doses (mg)	Number of Manufacturing companies	Min price (Rs)	Max. price (Rs)	% Price variation
Haloperidol	6	0.25	10	1.96	15	665
		0.50	2	8	18.99	137
		1.5	15	4.90	20	308
		2.5	3	9.08	20.50	125.7
		5	16	9.25	41.48	348
		10	13	6.13	58.54	262.9
		20	5	28.24	66.55	135.65
Flupentixol	3	0.5	2	20.25	20.9	32
		1	2	35.85	39.60	10.4
		3	2	76.05	80.45	5.16

**Table 4:** Price variation among combination therapy

Drug	Formulation	Doses (mg)	Number of Manufacturing companies	Min price (Rs)	Max. price (Rs)	% Price variation
Haloperidol + Trihexyphenidyl	2	5+2	7	20.65	28	35.59
		10+2	3	26.10	34.75	33.14
Risperidone + Trihexyphenidyl	3	2+2	4	31	39	25
		3+2	14	23.60	54	128.8
		4+2	11	36	57	58.3
Trifluoperazine + Trihexyphenidyl	2	1+2	14	6.56	29	342.07
		5+2	4	8.80	20	127.27
Chlorpromazine + Trihexyphenidyl	2	100+2	3	12.25	13.60	11.02
		200+2	3	18.90	22	16.4
Trifluoperazine + Chlorpromazine + Trihexyphenidyl	1	5+50+2	7	7.84	19.55	149.30

To our knowledge, this analysis is the first economic evaluation assessing price variation among various antipsychotics drugs in Indian market. Our study found that there is a large variation among antipsychotics drugs

available with maximum variation in Olanzapine and minimum with Flupentixol.

Medicines form a substantial portion of out of pocket spending on health by households in India. The private health sector provides 81 per cent of outpatient and 45



per cent of inpatient care in India, as public health facilities providing free or subsidized care, are inadequate in number and infra-structure.<sup>10</sup> Affordability of medicines thus, is a major issue determining access to medicines, as social insurance especially for people in the unorganized sector is lacking.

Large variation in costs of medicines was observed. In India, a major reason for this price variation is the pricing policy for medicines. The prices of all medicines not under price control have been left to the market forces. The maximum allowable post manufacturing expense (MAPE) permitted for medicines under price control is 100 per cent and ceiling prices have been fixed for these.<sup>11</sup> For the other medicines, there is no restriction on the MAPE, resulting in large and variable prices. The variation in prices of the same medicine but sold under different brands is large. So the study was designed to analyse price variation of a chronic and debilitating disease. The drug prices available in CIMS & IDR manual of an updated version were compared. Antipsychotic drugs were selected as it is one of the most expensive and the treatment requires continuous prescription drug use.

Our findings reveal that the prices of most of the antipsychotic brands have percentage price variation above 100% which is not an acceptable situation for patients. Out of 17 drugs studied, most of which are commonly prescribed, percentage price variation is very wide leading to unfair burden on the consumer. The reasons for this price variation could be as follows.<sup>12</sup>

1. Government regulations and pricing policies
2. The existing market structure of the pharmaceutical industry
3. Industry costs

## CONCLUSION

As the number of brands for a drug increases, percentage price variation also shows concurrent increase. Prescribers are very busy with their patients and don't get enough time to update their knowledge through the resources, hence, high cost of medicines in India makes treatment less affordable for the poor segments of the population. Modifications in Pharmaceutical Policy changes are urgently required to improve affordability

and hence access to medicines for the people. Thus, Price control mechanism has an important role and has positive impact on health care delivery system.

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