



ISSN: 2277- 7695

TPI 2015; 4(1): 67-70

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www.thepharmajournal.com

Received: 09-01-2015

Accepted: 18-02-2015

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## Cost-analysis of psychotropic drugs prescribed for the patients with schizophrenia in a university teaching hospital

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### Abstract

The study deals with the pharmacoeconomic assessment of schizophrenia. The cost of management of schizophrenia has been measured with a special concern to the cost of drugs prescribed for the treatment. The study has been conducted in a tertiary care teaching hospital of Dakshina Kannada, India. The study group includes in-patients who have been diagnosed with schizophrenia and admitted for the treatment of the same. An effort has been made to discover the direct cost acquired for the treatment of schizophrenia. In this study it has been observed that the utilization of olanzapine and the cost acquired by the same drug was found to be the highest (Rs. 31985.80) during the study period. When we calculated the cost of drugs prescribed from the hospital we found that the minimum cost of drug therapy per month was Rs. 75 for olanzapine and the same drug with other brand was Rs. 335.7. The cost index (CI) of Levosulpride was the lowest CI (1.07 times) and that of diazepam was the highest (11.04 times). Cost of different brands of psychotropic drugs available in the market was found to be 3 to 10 times higher between brands. The extent of difference observed in our study is a matter of concern. This highlights the need to prescribe generic drugs and choose brands that offer good quality low cost drugs.

**Keywords:** Cost of Illness, Schizophrenia, Pharmacoeconomics.

### 1. Introduction

Schizophrenia is considered as a serious and expensive disorder because its course is constant and it may have a major effect on the patient's ability for social adjustment and behaviour [1-5]. This illness is also linked with high costs on long-term management [6]. The launch of second-generation antipsychotics for treating schizophrenia has led to a contest regarding the costs of pharmacological management. In certain aspects, atypical antipsychotic drugs show better clinical response when compared to their typical antipsychotics. However, because of the high cost of these drugs, it is important to perform pharmacoeconomic evaluations routinely. In the management of schizophrenia preference of drugs is empirical, that may be directed by the presenting signs and symptoms, related features, mood state, and drug side effect which may be more acceptable in a particular patient. Individuals vary in their response to different antipsychotics and so there is no choice to expect how patients will respond better to a particular drug [7]. The cost of drug treatment differs from patient to patient and the cost of illness due to schizophrenia takes away about 1.6%-2.5% of healthcare budgets in the developed nations [8]. In developing nations like India there are limited numbers of studies relating to the cost analysis in schizophrenia disorders. The aim of the present study was to evaluate the costs associated with the psychotropic drugs used in the management of schizophrenia.

### 2. Materials and Methods

This prospective observational study was conducted at a 1200-bedded private tertiary care hospital located in Dakshina Kannada district. All the schizophrenia in-patients aged above 18 years and admitted to the psychiatry unit during the study period were enrolled after getting approval from Institutional Ethics Committee. The patient's case records were reviewed daily. Prescription details like date, names of individual drugs (generic/brand), fixed dose combination (FDC) drugs, number of drugs prescribed, dose dosage form, dosing schedule and duration of treatment were documented in the suitably designed data collection form.

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The cost of drugs prescribed from the pharmacy was obtained from <http://www.medguideindia.com>. The cost parameters calculated were average total cost per prescription, percentage of average cost due to psychotropic drugs, average cost borne by the patient. We calculated the price per 10 tablets/capsules/injection- 1 unit (minimum and maximum, as per medguideindia.com), average monthly cost (minimum and maximum) which was equal to Price per 10 tablets x 3 and cost index (CI) (Maximum price/Minimum price). The collected data were analyzed using SPSS software version 16.0.

### 3. Results and Discussion

#### 3.1 Description of study participants

A total of 200 patients who met the study criteria were enrolled in the study. Male patients (62.5%) outnumbered the female patients (37.5%). Most of the patients (34.5%) were in the age group of 21-30 years which illustrates the burden of ill health highly in the adult population. Paranoid schizophrenia was found to be highest in the study population. It was noticed that 46% of the patients belong to the poor economic status. The detailed list is presented in Table 1, Table 2 & Table 3.

**Table 1:** Age wise distribution of patients under study

Sl. No	Age groups	N=200	Percentage
1	18-20	10	5
2	21-30	69	34.5
3	31-40	64	32
4	41-50	38	19
5	51-60	19	9.5

**Table 2:** Types of schizophrenia in the study population

Sl. No	Schizophrenia types		
	Type	N= 200	%
1	Paranoid	124	62
2	Unspecified	32	16
3	Undifferentiated	26	13
4	Residual	8	4
5	Hebephrenic	7	3.5
6	Catatonic	3	1.5

**Table 3:** Economic status among the study population

Sl. No	Status	N=200	%
1	Below Poverty Line	33	16.5
2	Poor	92	46
3	Lower Middle Class	38	19
4	Middle Class	36	18
5	Upper Middle Class	1	0.5
6	Affluent/Rich	-	-

The cost of drug therapy is a significant feature in various psychiatric disorders, because of the long-lasting treatment procedures. The patient's drug therapy details which include drugs and its doses, respective brand names and its cost were documented. The total cost was summed together to obtain the total cost of drug treatment in the management of schizophrenia during the study period. The utilization of olanzapine and the cost acquired by the same drug was found to be the highest (Rs 31985.80) followed by clozapine (Rs 22139.40). This shows that atypical antipsychotic drugs are commonly prescribed and so the cost attained by the atypical drugs is found to be the highest in the study. Although, in few studies the reports suggest that on direct comparisons of atypical drugs, olanzapine is the most cost-effective [9-11]. The cost acquired for zuclopenthixol (Rs. 17136.00) was found to be the highest among the conventional antipsychotics followed by the injectable form of haloperidol (Rs. 9204.86). Presently, zuclopenthixol remains the top most among the conventional antipsychotics and olanzapine is the chief competitor of clozapine among the second generation antipsychotics for the management of schizophrenia. The overall cost acquired for the psychotropic drugs in the management of the schizophrenia during the study period was found to be Rs 138443.12. The detailed list of the costs used up on the psychotropic drugs is given below (Table 4).

We also found that the average cost of psychotropic drugs per schizophrenic patient for one day was Rs 19.39, the average cost utilized on psychotropic drugs for schizophrenic patients in the psychiatric unit per day was Rs 142.13 and the average cost of psychotropic drugs per patient for the management of disease during their hospital stay was Rs 692.21. Another study report in India shows that antipsychotic drugs are reasonably affordable while, auxiliary costs associated with the treatment are more expensive [12].

When we considered the cost of drugs prescribed from the hospital, we tried to find out the maximum and the minimum cost between the brands of each drug for the usually prescribed daily dose. The average monthly cost was identified only for the tablet formulations. It was noticed that the minimum cost of drug therapy per month was Rs. 75 for olanzapine and the same drug with other brand was Rs. 335.7. Cost index was calculated for all the psychotropic drugs as it gives an ideal view about the difference in cost of the same drug marketed by different companies. The cost index (CI) of levosulpride was the lowest CI (1.07 times) and diazepam was the highest (11.04 times). This highlights the need to prescribe generic drugs and choose brands that offer good quality low cost drugs especially in the low socioeconomic population. The details are depicted in (Table 4).

**Table 4:** Cost of drugs during the management of schizophrenia

Sl. No	Drug Name	Cost in Rs
1	T. Olanzapine	31985.80
2	T. Clozapine	22139.40
3	Inj. Zuclopenthixol	17136.00
4	T. Risperidon	14715.90
5	Inj Lorazepam	9778.96
6	Inj. Haloperidol	9204.86
7	T. Amisulphride	6969.16
8	T. Divalproex Sodium	5494.88
9	T. Risperidon+Trihexyphenidyl	4745.60

10	Trihexyphenidyl Hydrochloride	4006.48
11	T. Aripiprazole	1772.60
12	T. Zolpidem	1585.30
13	T. Escitalopram	1402.77
14	T. Lorazepam	1253.45
15	T. Quetiapine	1202.33
16	T. Lithium	1092.44
17	T. Levosulphride	837.90
18	Inj. Promethazine	619.78
19	T. Clonazepam	345.76
20	T. Fluoxetine	327.30
21	T. Chlorpromazine	322.26
22	Inj. Flupenthixol	293.10
23	T. Asenapine	291.50
24	T. Procyclidine	139.20
25	T. Carbamazepine	129.72
26	T. Oxcarbazepine	125.40
27	T. Trifluoperazine	120.86
28	Inj. Fluphenazine	96.22
29	T. Haloperidol	89.98
30	T. Dosulepin	51.65
31	T. Chlorpromazine + Trihexyphenidyl + Trifluoperazine	48.50
32	T. Amitriptyline	46.76
33	T. Sertraline	24.00
34	T. Alprazolam + Sertralin	23.58
35	T. Trifluoperazine + Trihexyphenidyl	12.45
36	T. Imipramine	4.90
37	T. Diazepam	4.62
38	T. Alprazolam	1.75
	Total	138443.12

**Table 5:** Cost analyses of drugs prescribed from the hospital to a sample of patients who attended the psychiatric in-patient department during the study period

Sl. No	Drugs	Dose in (mg)	Price per 10 tabs/caps/ Inj(1ml) in Rupees		Average monthly cost (Rs)		Cost Index (b/a)
			Min (a)	Max (b)	Min	Max	
1	T. Olanzapine	10	25	111.9	75	335.7	4.47
2	Inj. Haloperidol	5	4.50	8	-	-	1.77
3	Inj Lorazepam	2	7	15	-	-	2.14
4	T. Risperidon	4	26	62	78	186	2.38
5	T. Trihexyphenidyl	2	4.61	28.45	13.83	85.35	6.17
6	T. Lorazepam	2	5	35	15	105	7
7	T. Clozapine	100	39	79	117	237	2.02
8	Inj. Zuclopenthixol	200	272	272	-	-	1
9	T. Risperidon + Trihexyphenidyl	4+2	18	56	54	168	3.11
10	T. Amisulphride	200	140.27	199.50	420.81	598.5	1.42
11	T. Divalproex Sodium	500	32	91.88	96	275.64	2.87
12	T. Clonazepam	0.5	9	35.10	27	105.3	3.9
13	Inj. Promethazine	50	1	4.66	-	-	4.66
14	T. Quetiapine	100	40	65	120	195	1.62
15	T. Chlorpromazine	100	5.06	12	15.18	36	2.37
16	T. Aripiprazole	10	52	76.75	156	230.25	1.47
17	T. Escitalopram	10	22	83.33	66	249.99	3.78
18	T. Fluoxetine	10	13	26.69	39	80.07	2.05
19	T. Trifluoperazine	5	3.80	21.45	11.4	64.35	5.64
20	T. Asenapine	5	55	55	165	165	1
21	Inj. Fluphenazine	25	23.76	45	-	-	1.89
22	T. Lithium	400	14.45	49	43.35	147	3.39
23	T. Levosulphride	100	140	150	420	450	1.07
24	T. Sertraline	25	15	40.40	45	121.2	2.69
25	Inj. Flupenthixol	20	97.70	115.35	-	-	1.18
26	T. Amitriptyline	25	4.80	30	14.4	90	6.25
27	T. Oxcarbazepine	300	30	94.30	90	282.9	3.14
28	T. Trifluoperazine + Trihexyphenidyl	5+2	6.35	29	19.05	87	4.56
29	T. Dosulepin	50	30	76	90	228	2.53

30	T. Imipramine	25	6	10.60	18	31.8	1.76
31	T. Haloperidol	5	11.02	40.87	33.06	122.61	3.70
32	T. Alprazolam + Sertralin	0.5+50	38	56.70	114	170.1	1.49
33	T. Diazepam	10	3.70	40.85	11.1	122.55	11.04
34	T. Alprazolam	0.25	1.00	13.50	3	40.5	13.5
35	T. Carbamazepine	200	10	24	30	72	2.4
36	T.Chlorpromazine+ Trihexyphenidyl+Trifluoperazine	50+2+5	3.80	16.20	11.4	48.6	4.26
37	T.Procyclidine	5	25	54.50	75	163.5	2.18
38	T.Zolpidem	10	20	97.50	60	292.5	4.87

\*The minimum and maximum cost was obtained from <http://www.medguideindia.com>

#### 4. Conclusion

The use of olanzapine was found to be the key reason for the majority of the cost utilized in the management of schizophrenia. The cost associated with this drug was relatively higher than that with the other antipsychotics analyzed. The higher the possibility of the patient receiving olanzapine, higher the total cost. Cost of different brands of psychotropic drugs available in the market was found to be 3 to 10 times higher between brands. The magnitude of difference observed in our study is a matter of concern. There is a need to prescribe generic drugs and or choose brands that offer good quality low cost drugs. Such measures can definitely decrease the cost of therapy. Promoting cost effective drugs may benefit many patients especially in the low socioeconomic population.

#### 5. Reference

1. Tarricone R, Gerzeli S, Montanelli R *et al.* Direct and indirect costs of schizophrenia in community psychiatric services in Italy. The GISIES study. Interdisciplinary study group on the economic impact of schizophrenia. *Health Policy* 2000; 51:1–18.
2. Ko SY, Chen PS, Yang YK *et al.* Correlation between performance on the continuous performance test and economic costs in patients with schizophrenia. *Psychiatry Clin. Neurosci* 2003; 57:373–377.
3. Andrews G, Hall W, Goldstein G *et al.* The economic costs of schizophrenia. Implications for public policy. *Arch. Gen. Psychiatry* 1985; 42: 537–543.
4. Wasylenki DA. The cost of schizophrenia. *Can J Psychiatry* 1994; 39:S65–S69.
5. Rund BR, Ruud T. Costs of services for schizophrenic patients in Norway. *Acta Psychiatr Scand* 1999; 99:120–125.
6. Knapp M, Simon J, Percudani M, Almond S. Economics of schizophrenia: a review. In: Maj M, Sartorius N (editors). *WPA Series in Evidence-Based Psychiatry: Schizophrenia*. Edn 2, Chichester: John Wiley and Sons, 2002, 413-60.
7. Tripathi KD, *Drugs used in mental illness: Antipsychotic and antianxiety drugs*, *Essentials of Medical Pharmacology*, Edn 5, Jaypee Publications, 2003, 390.
8. Davies LM, Drummond MF, Economics and schizophrenia: the real cost. *Br J Psychiatry* 1994; (25):18-21.
9. Palmer CS, Revicki DA, Genduso LA *et al.* A costeffectiveness clinical decision analysis model for schizophrenia. *Am J Manag Care* 1998; 4:345–355.
10. Procyshyn RM, Zerjav S. Drug utilization patterns and outcomes associated with in-hospital treatment with risperidone or olanzapine. *Clin Ther* 1998; 20:1203–1217, 1192–3.
11. Del PDS. The pharmacoeconomics and efficacy of atypical antipsychotics within Alameda County BHCS. *Behav. Health Care* 1998; 2:10–14
12. Girish K, Pratima M, Isaac MK. Drug treatment in schizophrenia: Issues of comparability and costs. *Indian J Psychiatry* 1991; 41:100–3.