

A Cross Sectional Study to Observe Cost of Benzodiazepines in Adult Patients with Psychiatric Disorders

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Abstract:

Background: Benzodiazepines are sedative-hypnotic medications that have been used for decades in the treatment of anxiety, epilepsy, insomnia, and other conditions. Prolonged use of benzodiazepines leads to adverse effects like addiction problems, with withdrawal symptoms, diminishing effect and difficulty in discontinuing treatment.

Aims and Objectives: This observational cross-sectional study was designed to study the cost of benzodiazepines in adult population in psychiatry outpatient department of a tertiary general hospital.

Materials and Methods: In 1 year duration study, 400 patients on benzodiazepines enrolled in this study and they filled up a questionnaire designed for the study. The data was evaluated using descriptive statistics.

Results: The most economical drug was found to be Clonazepam 0.5mg dose, which is a longer acting benzodiazepine. Its cost per pack of 10 tablets was Rs 5.5 with per day cost was Rs 0.55. The costliest benzodiazepine prescribed was Chlordiazepoxide 10mg twice a day with cost per pack of 10 tablets was Rs 21 with per day cost was Rs 4.2.

Conclusion: There is a requirement for data, which can help implement better strategy for regulation of the cost analysis at all levels to reduce burden on the patient. More studies in larger samples and multiple centres throughout the nation are needed to justify our findings.

Keywords: Benzodiazepines, Clonazepam, Lorazepam, Cost analysis.

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Introduction

Benzodiazepines were circulated in the market in 1960, they became the most prescribed drugs and the most used to combat anxiety and insomnia.[1] Their popularity among patients and clinicians is primarily due to the effectiveness and rapid onset in producing anxiolysis compared to other agents.[2] It is advised that the maximum duration of benzodiazepines is between 2 and 4 weeks for insomnia or anxiety and no more than 2 weeks for mixed anxiety-depressive disorders.[3]

These were recommended based on the long-term development of tolerance, dependence, abuse and withdrawal syndrome, although recent retrospective studies showed a level of dependence after chronic consumption that was lower than previously described, even in older people.[4] In any case, benzodiazepines have been demonstrated to increase the risk of falls, hip fractures and detrimental cognitive effects. Most benzodiazepines are prescribed by primary care services due to the greater number of elderly

patients who visit these practices. However, in relative terms, psychiatrists present the highest prescription rates.[3] Risk factors, common to benzodiazepine use are increasing age and female gender, regardless of the population. Other reported associations are cigarette smoking, marital status, education and occupation.[5] This could be explained by the predominately elderly status of the population, which would be primarily female, and are divided into two obvious sub-groups, one may have been prescribed benzodiazepines for grief, the other may be who commenced benzodiazepine use to treat menopausal symptoms.[6]

There have been concerns that long term consumption may result in the development of tolerance illustrated by loss of efficacy or increase in dose. The majority of benzodiazepine users did not seem to require dose acceleration suggests that, although they seemed to depend on the benzodiazepines apparently for its anxiolytic property, such reliance is not to be associated with

dependence.[7] There has been an increase in the percentage of general practice prescriptions for minor tranquillizers issued on repeat basis. It is seen that the long-term users of benzodiazepines are older people who are prescribed hypnotic medication.[8]

Drug utilisation research holds a vital role in clinical practice as it forms the basis for making revisions in the drug dispensing policies at local and national levels. The ultimate goal is to facilitate rational drug use. It is particularly needed in a developing economy like India where 72% of all health care burden is borne by the patients as it helps in developing strategies to utilize health resources in the most efficient manner.[9]

Pharmacoeconomic research identifies measure and compares the costs and consequences of pharmaceutical product and service utilization. For any pharmacoeconomic analysis to be useful, the multidimensional concept of medical-treatment value must be accepted. This requires the investigator to assess and balance the factors that determine total treatment costs and clinical benefits.[10]

Cost minimization, cost effectiveness, cost benefit, and cost utility are the basic types of pharmacoeconomic analyses.[11] Cost minimization is the simplest of these analyses, as it assumes that the outcomes of the therapies being compared have been proven equivalent among treatment groups. In this approach one is looking for the treatment alternative that produces identical clinical outcomes at the least cost.[12]

The rational use of drug is centred on the rule of right which means the right drug to the right patient in right dosage and at a right cost. The irrational prescribing pattern is global concern because it including misuse, overuse and underuse of medicines can lead to insecure treatment, aggravation of the disease, health hazards and increasing cost on the patients and wastage of resources.[13]

The Indian health care delivery system functions at different levels with primary health centres attending mainly the rural population as the first level of contact and the tertiary level provide referral services.

Appropriate drugs utilizations are an important expertise which needs to be continuously evaluated and improved. It reflects physician's knowledge of pharmacology and pathophysiology and expertise in diagnosis and attitude towards selecting the most appropriate cost effective treatment.[14] It was seen that WHO-India Programme on Essential Drugs has resulted in improved approach for poor people in keeping down the cost of drug successfully, holding the cost-price line for most

drugs for affordability and in the case of certain things, considerably lowering the cost compared with previous years, resulting in a significant reduction in the cost of therapy for a number of diseases.[15] It is well known that indiscriminate and non-selective use of drugs results in side effects, drug interactions and poses difficulties in diagnosis. Developed nations consume 85% total world production of drugs which is valued at around US \$100 billion. The remaining 15% is available to population living in developing countries. Very few studies have been conducted to estimate drug costs in India.[16]

Drug utilisation study in Australia showed that the four drugs listed on the Pharmaceutical Benefits Scheme, namely diazepam, oxazepam, nitrazepam and temazepam, constituted 82% of the Australian market in past years.

The reason was the availability of government subsidy which influences benzodiazepine-prescribing behaviour. But now it was seen that benzodiazepine utilisation has been falling in recent years due to the implementation of new guidelines and community awareness campaigns.[17] It is necessary to scientifically value the cost and consequences of drug therapy.

Pharmacoeconomics can evaluate outcomes of drug therapy and put them in perspective with other related healthcare expenditure. It has been defined as the description and analysis of the cost of drug therapy to health care systems and society.[18]

Materials and Methods

This was a 1 year long cross-sectional study with sample size of 354 conducted in Department of Pharmacology, Government Medical College, Patiala in association with Department of Psychiatry, Rajindra Hospital, Patiala which is a tertiary care, multi-speciality hospital attached to Government Medical College, Patiala. Inclusion criteria include: Adults of either gender or age > 18 years. Exclusion criteria include: children, pregnant women, seriously and acutely ill patients, patients having insufficient data records and allergic patients.

Data were collected from patients attending the psychiatry outpatient department on random sampling. The information was collected on a questionnaire containing questions based on patient sociodemographic data, diagnosis of psychiatric illness along with prescription of benzodiazepines given to the patient.

The sociodemographic data included patient's OPD number, gender, age, marital status, occupation and education. Primary psychiatric diagnosis was noted, and benzodiazepine prescription pattern was noted according to WHO core drug prescribing indicators.

The questions were answered by the patient themselves or their relatives and attendants. Cost of drugs prescribed from the hospital schedule was calculated based on the rate contract available in hospital drug store. As benzodiazepines were prescribed for maximum of 4 weeks, so, the cost parameters calculated were total cost per tablet, cost per 10 tablets, cost per day, cost per 7 days, 14 days, 21 days and cost per month.

All patients had given informed consent from the patients or their attendants according to an approved protocol. The data were scrutinized using simple descriptive statistics.

The study was approved by the Institutional Ethics Committee. Quantitative data was expressed using

mean and standard deviation and qualitative data was expressed in frequency and percentage.

Results:

A total of 225 (56.25%) patients were female and 175 (43.75%) were males. The mean age of the group was 41.34 ± 12.61 years. 75% patients were married and housewife's (31.25%) were the major patients prescribed with benzodiazepines. 52.50% patients were educated till primary school level.

And the reasons for prescribing benzodiazepines were anxiety disorder in 96 (24%) patients followed by bipolar disorder in 63 (15.75%), followed by psychotic and mood (affective disorders). Clonazepam and Lorazepam were the most commonly prescribed medications.

Table 1: Distribution of Cost of Benzodiazepines in Rupees in study population

Drug	Cost/ 10 Tab	Cost/ Tab	Cost/ Day	Cost/ 7 Days	Cost/ 14 Days	Cost/ 21 Days	Cost/ Month	χ^2	p value
Clonazepam 0.5mg HS	5.5	0.55	0.55	3.85	7.7	11.5	16.5	5.83	0.016
Clonazepam 0.5mg BD	5.5	0.55	1.1	7.7	15.4	23.1	33		
Clonazepam 0.25mg BD	10	1	2	14	28	42	60		
Clonazepam 0.25mg HS	10	1	1	7	14	21	30		
Lorazepam 2mg HS	12	1.2	1.2	8.4	16.8	25.2	36		
Lorazepam 2mg BD	12	1.2	2.4	16.8	33.6	50.4	72		
Lorazepam 1mg HS	11	1.1	1.1	7.7	15.4	23.1	33		
Lorazepam 1mg BD	11	1.1	2.2	15.4	30.8	46.2	66		
Nitrazepam 10mg HS	9	0.9	0.9	6.3	12.6	18.9	27		
Chlordiazep oxide 10mg BD	21	2.1	4.2	29.4	58.8	88.2	126		
Clonazepam 0.5mg+ Escitalopram 5mg BD	14.3	1.43	2.86	20.02	40.04	60.06	85.8		
Alprazolam 0.25mg+ Propranolol 10mg BD	15	1.5	3	21	42	63	90		

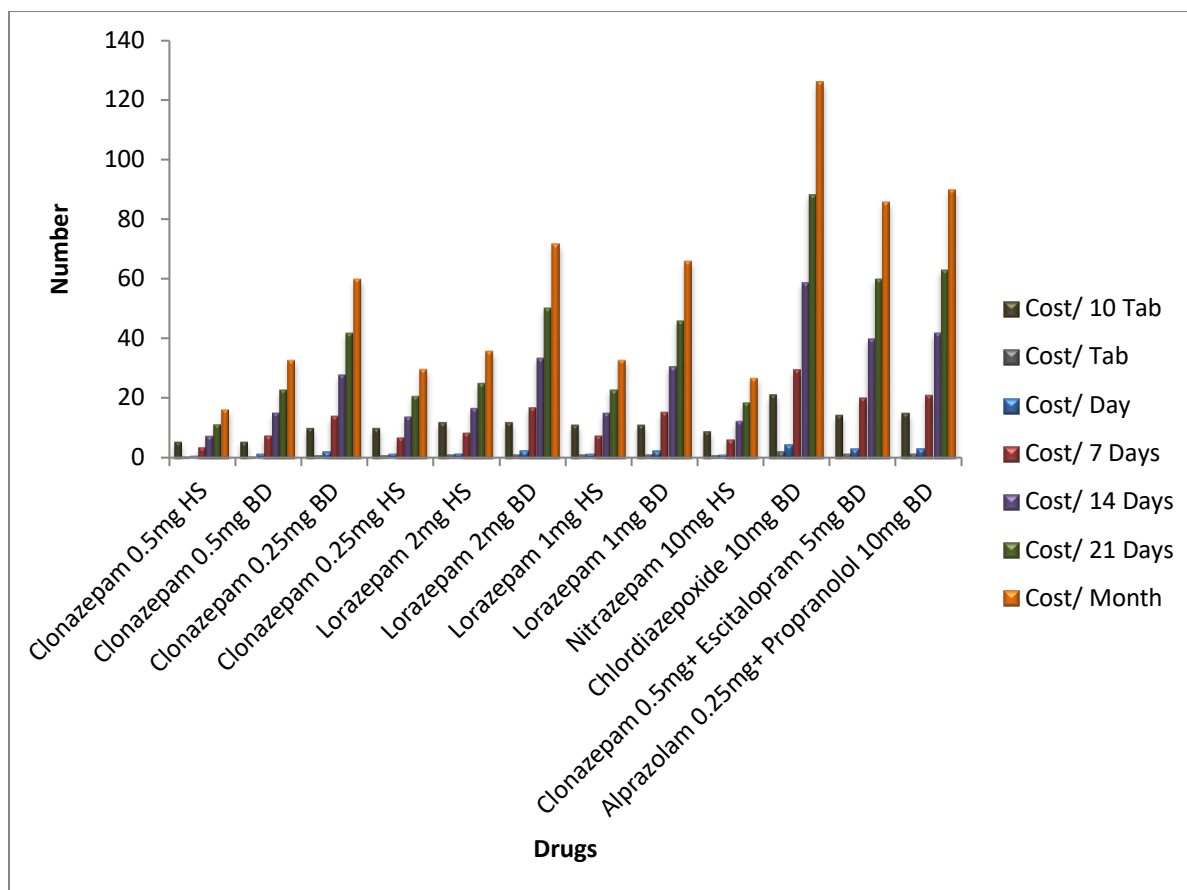


Figure 1: Distribution of cost of Benzodiazepines in Rupees in study population

The most economical drug was found to be Clonazepam 0.5mg dose, which is a longer acting benzodiazepine. Its cost per pack of 10 tablets was Rs 5.5 with per day cost was Rs 0.55, cost per 7 days was Rs 3.85, cost per 14 days was Rs 7.7, cost per 21 days was Rs 11.5 and cost per month was Rs 16.5. The costliest benzodiazepine prescribed was Chlordiazepoxide 10mg twice a day with cost per pack of 10 tablets was Rs 21 with per day cost was Rs 4.2, cost per 7 days was Rs 29.4, cost per 14 days was Rs 58.8, cost per 21 days was Rs 88.2 and cost per month was Rs 126.

Discussion

Long-term use of benzodiazepines is extensive as seen in Spain, more than 7% of the population using them regularly, whereas in the United Kingdom, Germany or Netherlands, prevalence is less than 2%. It was seen in that the cost of long-term benzodiazepine prescription alone, the estimated cost in Spain is over €70 million per annum and the full economic cost to healthcare is much higher, if the consequences of associated morbidities were considered.[19]

Another reason for the rise in drug costs is discovery of new medications and vaccines that prevent and treat over many conditions were approved by the United states Food and Drug Administration (FDA).[20] In study Piparva KG et

al cost of clonazepam 2mg dose was Rs 2.98 to Rs 5.59 and lorazepam 1mg was Rs 0.30 to Rs 2.00.[21] In another study done by Thakkar KB et al the cost of clonazepam 0.5mg dose was Rs 10 and monthly cost was Rs 45 and lorazepam 2mg was Rs 9 and Rs 27.[22]

In a study by Ezenduka CC et al the cost of drugs is expressed in Nigerian Naira (N) and converted to the United States Dollar (\$) of N120 to 1US\$ at the 2008 exchange rate. The costs of anti-anxiety agents were each below N50, fall within the inexpensive category. Diazepam and nitrazepam were the most prescribed drugs in this group, followed by lorazepam. Diazepam at dose 5mg cost N10.00, Lorazepam at 2mg cost N16.00 and Nitrazepam at 5mg cost N7.00.[23] In study done by Greenblatt DJ et al the average cost per prescription was \$15.23 for generics, compared with \$198.47 for brand-name drugs.

Alprazolam was most extensively prescribed among other drugs. Alprazolam cost per prescription was \$11.76, for clonazepam was \$12.60, lorazepam cost was \$13.12 and diazepam \$8.80 which cheapest among benzodiazepines.[24]

The Indian pharmaceutical industry is a centre where medications can be manufactured at a low price and are of international quality. India is a producer of ample amount of quality drug at low

cost, yet only one third of its population has approach to essential medicines. Medication prices are the lowest among prices in the world, but the overall expenses associated with medications continue to ascend in the country.

Both the patients and the insurance industry will benefit by application of pharmacoeconomic principle in the hospital administration and treatment etiquette. Patients will acquire better quality healthcare at reduced costs, and the clinician will be able to provide enhanced care to their patients at minimum cost.[25]

Conclusion

With the increasing healthcare costs, value added care should be provided to the patients by individual healthcare institution which needs further research. The development of pharamcoeconomics in India is increasing due to rapid growth of clinical research. There is need to implement the principles of economics in daily basis practice in community and hospital pharmacy.

There is an additional demand for insurance systems that inspire consumer to contain costs by providing incentives as well as contain their health expenditure. It is necessary that the benefits offered and obligations are coordinated and regulated. Further expansion of insurance services, and more focus assigned on preventive care and wellness programs are needed.

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