International Journal of Current Pharmaceutical Research

ISSN- 0975-7066 Vol 16, Issue 6, 2024

Original Article

INCREASED COST BURDEN ON PATIENTS OF MENTAL DISORDERS CORRELATED WITH POOR MEDICATION ADHERENCE: A CROSS-SECTIONAL STUDY AT A TERTIARY CARE HOSPITAL IN NORTH INDIA DURING COVID-19 PANDEMIC

ASHISH KUMAR[1], SUMITA HALDER[1*], SHRUTI SRIVASTAVA[2], RACHNA GUPTA[1]

[1]Department of Pharmacology, University College of Medical Sciences and Guru Teg Bahadur Hospital, Dilshad Garden, Delhi-110095, India.
[2]Department of Psychiatry, University College of Medical Sciences and Guru Teg Bahadur Hospital, Dilshad Garden, Delhi-110095, India
*Corresponding author: Sumita Halder; Email: sumitahalder123@rediffmail.com

Received: 10 Sep 2024, Revised and Accepted: 22 Oct 2024

ABSTRACT

Objective: This study was planned to evaluate the correlation between cost borne by the patient and medication adherence in common mental disorder patients during COVID-19 pandemic.

Methods: A descriptive cross-sectional drug utilization study was undertaken in 200 patients. Pattern of psychotropic drugs usage was analyzed as per WHO/INRUD guidelines and average monthly cost borne by the patient/hospital per prescription was correlated with medication adherence of the patients.

Results: The average monthly costs borne by patients and hospital were observed to be more during the pandemic as compared to pre-pandemic time. It was observed that patients bearing some cost on their own had significantly lower medication adherence compared to those patients whose cost of treatment was borne by the government-funded hospital (p-value of 0.017). The medication adherence in patients of mental disorders was found to be negatively correlated to the cost was borne by the patients.

Conclusion: The COVID-19 pandemic has escalated the total cost borne by the patients as well as the financial burden on government-funded hospitals.

Keywords: COVID-19, Drug utilization, Medication adherence

DOI: https://dx.doi.org/10.22159/ijcpr.2024v16i6.5079 Journal homepage: https://innovareacademics.in/journals/index.php/ijcpr

INTRODUCTION

Corona Virus Disease 2019 (COVID-19) pandemic has led to short term as well as long-term rise in mental health problems around the globe resulting in increased burden on the economics of the healthcare system [1]. Despite all the efforts for redistribution of available resources to deal with the challenge, the healthcare system has borne the brunt financially [2]. As drug therapy accounts for major portion of health expenditure, drug utilization studies in combination with pharmaco-economic analysis contribute significantly in the facilitation of rational usage of drugs, which in-turn would result in cost-effective utilization of the healthcare resources [3].

A large amount of existing literature suggest that a proper medication adherence leads to better therapeutic outcomes and lowers the healthcare cost substantially. Contrarily, non-adherence to medications could reduce the effectiveness of the therapy, responsible for 10% of all the hospitalizations, leading to further increase in healthcare burden [4, 5]. It has been observed that the expenditure in the treatment of COVID-19 infection of an individual can influence the compliance to medication by the patient [6].

In the light of the above observations and the current COVID-19 crisis, we conducted a cross-sectional study in patients of common mental disorders to assess the correlation between the average cost borne by the patient or the hospital and medication adherence.

MATERIALS AND METHODS

Study design and ethical considerations

A descriptive cross-sectional drug utilisation study (DUS) was performed after a prior approval from Institutional Ethics Committee-Human Research (IEC-HR, University College of Medical Sciences, Delhi, India dated 22.12.2020 Approval number: IEC-HR/2020/PG/46/24). A proper written informed consent was taken from the patients participating in the study. It was ensured that each participant gave their "consent" for the data to be used for research purpose.

Selection criteria

Inclusion criteria: Patients of either sex aged between 18-60 y and diagnosed with Common Mental Disorders (Depression and Anxiety disorders as per WHO definition) on medications for at least 4 w.

Exclusion criteria: Patients with organic brain disease, having any history of substance intoxication or overdose, unable to come physically or communicate and any serious medical illness such as myocardial infarction, cerebrovascular accident, diabetic coma, or any surgical condition that requires immediate intervention. Patients with high suicide risk were excluded from the study (based on a detailed Psychiatric evaluation carried out by the clinician). Additionally, the California suicide risk estimator scale [7] was used wherever feasible.

Sample size

A total of 200 patients were recruited in the study (100 patient's during COVID-19 pandemic and 100 patient's prescription data was obtained from pre-COVID-19 period as a comparator arm).

Study procedure

The data of the patients attending the Psychiatry OPD of University College of Medical Sciences and Guru Teg Bahadur Hospital, Delhi, India, during the period 1st January 2021 to 31st August 2022, was collected and recorded in a structured case record form.

The data analysis was conducted as follows:

- The prescriptions were evaluated as per WHO-INRUD drug prescribing indicators [8], including:

(a) Average number of drugs per prescription.

(b) Percentage of drugs prescribed by generic name.

(c) Percentage of the drugs prescribed from the list of essential medicines.

(d) Percentage of prescriptions with injections(s) prescribed.

- The National List of Essential Medicines (NLEM) 2015 of India was used to check whether the drugs prescribed were from the list [9].

- Medication adherence was evaluated using a self-administered medication compliance questionnaire and its correlation with average number of side effects per prescription was done.

- Cost analysis to evaluate the expenditure incurred by the patient and the approximate total cost-burden borne (pertaining to the sample size) by the hospital was done.

  - The Cost parameters calculated were total cost per prescription per month, average monthly cost borne by the patient and average monthly cost borne by the hospital.

  - For drugs that were purchased by the patient from the hospital, the cost of drugs was calculated based on the rate contract available from the hospital drug store.

  - Cost of drugs that were purchased by the patient from pharmacy outside the hospital was obtained from patients as well as from the Drug Index (DI) [10].

Statistical analysis

Statistical analysis was done with the IBM SPSS version 20.0. Continuous variables are presented as mean±SD. Categorical variables are expressed as frequencies and percentages. Categorical data between the groups are compared using Chi-squared test. The Shapiro wilk test has been applied to test the normality of continues data in case of parametric test. The comparison of normally distributed continuous variables between two groups was performed using unpaired t-test and Mann-Whitney U test for not normally distributed variables. For all statistical tests, a p-value less than 0.05 has been taken to indicate a significant difference/association/correlation.

RESULTS

Analysis of prescription patterns as per WHO/INRUD drug use indicators

A total of 200 prescriptions were evaluated for drug use indicators. Less than two percent of the prescriptions contained more than five drugs per prescription. Apart from psychotropic drugs, other commonly co-prescribed drugs were vitamin B complex, calcium and vitamin D3 and antacids. Comparison between various drug use indicators during COVID-19 and pre-COVID-19 pandemic is shown in (table 1).

Cost analysis comparison during the COVID-19 pandemic and during pre-pandemic period

The total of average monthly cost borne by the patient and total of average monthly cost borne by the hospital during COVID-19 pandemic was 1427 and 8131 rupees respectively. While during pre-COVID-19 period the total of average monthly cost borne by the patient and total of average monthly cost borne by the hospital was 998 and 7379 rupees, respectively (table 2).

Table 1: WHO/INRUD core prescribing indicators during pre-COVID-19 and during COVID-19 pandemic

Drug use indicators			
Indicator	**PRE-COVID-19**	**COVID-19**	**P-value**
Average number of drugs per prescription	2.48±1.09	2.96±1.18	0.003
Percentage of drugs prescribed by generic name	97.40%	95.77%	0.139
Percentage of the drugs prescribed from the list of essential medicines	89.40%	85.12%	0.039
Percentage of prescriptions with injections prescribed	0.45%	0.53%	-

Table 2: Cost analysis comparison during COVID-19 pandemic and during pre-COVID-19 pandemic times

Cost analysis	**During COVID-19 (n=100)**	**During pre-COVID-19 (n=100)**
Average monthly patient cost	1427	998
Average monthly hospital cost	8131	7379

Association between medication adherence and average cost borne by the patient

The medication adherence was found to be poor in patients where from the total cost of the prescription, some cost was borne by the patient in comparison with zero cost borne by the patient (*p-value of 0.017). In total 85 patients where patient spent zero cost, 40% (n=34) patients had incomplete medication adherence and 60% (n=51) patients had complete medication adherence. In 15 patients where patient spent some cost, 73.3% (n=11) patients had incomplete medication adherence and 26.7% (n=4) patients had complete adherence with the medications (table 3).

Table 3: Association between medication adherence and average cost borne by the patient

		Medication adherence		**Total**	**Chi-square value**
		Incomplete	**Complete**		
Average monthly patient cost	Zero cost	34	51	85	5.72
		40.0%	60.0%	100.0%	
	Some cost	11	4	15	
		73.3%	26.7%	100.0%	
Total		45	55	100	
		45.0%	55.0%	100.0%	

p<0.05 shows statistically significant association between the variables. Test Applied: Chi-square test

DISCUSSION

COVID-19 pandemic has adversely affected the mental health and well-being globally [11]. Consequently, there has been increased use of psychotropic drugs as we found in our cross-sectional drug utilization study that the average number of drugs per prescription was 2.96±1.18 during COVID-19 pandemic as compared to 2. 48±1.09 during the pre-pandemic period. (WHO recommended value 1.6 to 1.8) [12, 13].

It was observed that, a large proportion of drugs i. e. 95.77% during COVID-19 pandemic period and 97.40% during pre-pandemic period were prescribed by generic name. This percentage was slightly lower than the WHO recommendation of 100%, yet better than observations of other similar studies [14]. Use of drugs from national list of essential medicine was also high i. e., 85.12% during COVID-19 pandemic period and 89.40% during the pre-pandemic period, which is higher than a similar study conducted by Sarangi *et al.* [15].

No similar studies conducted during COVID-19 were found with which we could compare our cost parameters.

In this study, it was observed that non-adherence to medications was associated with some cost borne by the patient as compared to zero cost borne by the patient for the prescription drugs. A similar study done by Gu *et al.* among elderly cancer survivor patients with depression taking anti-depressants revealed that increase in cost borne by the patients leads to poorer medication adherence [16]. A recently published systemic review by Holbrook *et al.* focused on association between medication cost and medication adherence. The study concluded that patient's high out-of-pocket medication costs was associated with lower adherence with the medication, thus strengthening our observations further [17].

It is worth emphasizing that in a developing country like India where a huge population is below the poverty line, any extra expenditure on purchase of medicines is a powerful deterrent for medication compliance for the majority of the population [18] thereby increasing the overall morbidity. The government of India allocates huge funds for the healthcare sector so that this vulnerable population is not deprived of the basic healthcare facilities [19]. COVID pandemic has also brought to light the increase in mental disorders and also an increase in cost of medication during the pandemic as compared to the pre pandemic period. It also highlights that any cost which was borne by the patient himself and not by the government-funded hospital had a negative correlation with the medication adherence. This is a direct cue to the regulatory authorities to ensure proper allocation of funds for the purpose of healthcare.

In the present scenario, we shall propose switching prescriptions to lower cost by prescribing more generic prescriptions, prescribing more medications from essential list of medicines and prescribing drugs from hospital pharmacy. This can reduce the cost burden on patients, especially those with poor adherence to improve the therapeutic outcomes.

ACKNOWLEDGEMENT

We are grateful to the University College of Medical Sciences and the staff of the Psychiatry OPD at Guru Teg Bahadur Hospital for their support in the conduct of the study.

FUNDING

Nil

AUTHORS CONTRIBUTIONS

AK contributed to the acquisition, analysis or interpretation of data and drafting the article.

SH made a substantial contribution to the concept or design of the work; or acquisition, analysis or interpretation of data, and revised the article critically for important intellectual content.

SS contributed to the acquisition, analysis or interpretation of data.

RG contributed in the concept and editing of the manuscript.

CONFLICTING INTERESTS

The author declares that there is no conflict of interest.

REFERENCES

1. Shuja KH, Aqeel M, Jaffar A, Ahmed A. COVID-19 pandemic and impending global mental health implications. Psychiatr Danub. 2020;32(1):32-5. doi: 10.24869/psyd.2020.32, PMID 32303027.
2. Richards F, Kodjamanova P, Chen X, LI N, Atanasov P, Bennetts L. Economic burden of COVID-19: a systematic review. Clinicoecon Outcomes Res. 2022 Apr 28;14:293-307. doi: 10.2147/CEOR.S338225, PMID 35509962.
3. Sacristan JA, Soto J. Drug utilisation studies as tools in health economics. Pharmacoeconomics. 1994;5(4):299-312. doi: 10.2165/00019053-199405040-00005, PMID 10147239.
4. Sarangi SC, Kaur N, Tripathi M, Gupta YK. Cost analysis study of neuropsychiatric drugs: role of national list of essential medicines India. Neurol India. 2018;66(5):1427-33. doi: 10.4103/0028-3886.241345, PMID 30233018.
5. Stirratt MJ, Curtis JR, Danila MI, Hansen R, Miller MJ, Gakumo CA. Advancing the science and practice of medication adherence. J Gen Intern Med. 2018;33(2):216-22. doi: 10.1007/s11606-017-4198-4, PMID 29204969.
6. Niu J, Chen H, Chen K, Liu Y, JU F, Xue T. Effect of pharmaceutical care on the treatment of COVID-19: a protocol for systematic review and meta-analysis. Med (Baltim). 2020;99(48):e23377. doi: 10.1097/MD.0000000000023377, PMID 33235111.
7. California risk estimator for suicide. Psychology Resource Centre. Available from: https://psycentre.apps01.yorku.ca/wp/california-risk-estimator-for-suicide/. [Last accessed on 24 Nov 2022].
8. WHO. Inrud drug prescribing indicators at primary health care centres in Eastern province Saudi Arabia. Available from: https://apps.who.int/iris/handle/10665/118483. [Last accessed on 24 Nov 2024].
9. National list of essential medicines (NLEM); 2015. https://www.nppaindia.nic.in/wp-content/uploads/2020/08/NLEM-2015.pdf. [Last accessed on 28 Nov 2022].
10. Passi. Drug index. Vol. 22. Passi Publications; 2021. https://www.org/indexes.html. [Last accessed on 30 Nov 2022].
11. Hossain MM, Tasnim S, Sultana A, Faizah F, Mazumder H, Zou L. Epidemiology of mental health problems in COVID-19: a review. F1000Res. 2020 Jun 23;9:636. doi: 10.12688/f1000research.24457.1, PMID 33093946.
12. Varma P, Junge M, Meaklim H, Jackson ML. Younger people are more vulnerable to stress anxiety and depression during COVID-19 pandemic: a global cross-sectional survey. Prog Neuropsychopharmacol Biol Psychiatry. 2021;109:110236. doi: 10.1016/j.pnpbp.2020.110236, PMID 33373680.
13. Atif M, Azeem M, Sarwar MR, Shahid S, Javaid S, Ikram H. WHO/INRUD prescribing indicators and prescribing trends of antibiotics in the accident and Emergency Department of Bahawal Victoria Hospital Pakistan. Springerplus. 2016;5(1):1928. doi: 10.1186/s40064-016-3615-1, PMID 27933228.
14. Galappatthy P, Ranasinghe P, Liyanage CK, Wijayabandara MS, Mythily S, Jayakody RL. WHO/INRUD core drug use indicators and commonly prescribed medicines: a national survey from Sri Lanka. BMC Pharmacol Toxicol. 2021;22(1):67. doi: 10.1186/s40360-021-00535-5, PMID 34711271.
15. Jha AK, Aubert RE, Yao J, Tea garden JR, Epstein RS. Greater adherence to diabetes drugs is linked to less hospital use and could save nearly $5 billion annually. Health Aff Millwood. 2012;31(8):1836-46. doi: 10.1377/hlthaff.2011.1198.
16. GU D, Shen C. Cost-related medication nonadherence and cost reduction strategies among elderly cancer survivors with self reported symptoms of depression. Popul Health Manag. 2020 Apr;23(2):132-9. doi: 10.1089/pop.2019.0035, PMID 31287770.
17. Holbrook AM, Wang M, Lee M, Chen Z, Garcia M, Nguyen L. Cost related medication nonadherence in Canada: a systematic review of prevalence predictors and clinical impact. Syst Rev. 2021;10(1):11. doi: 10.1186/s13643-020-01558-5, PMID 33407875.
18. Rao TS, Manohar JS, Raman R, Darshan MS, Tandon A, Karthik KN. The prospective 24 w assessment of cost efficacy of and compliance to antidepressant medications in a rural setting (PACECAR) study. Indian J Psychiatry. 2017;59(2):157-63. doi: 10.4103/psychiatry.IndianJPsychiatry_202_17, PMID 28827861.
19. Jain B, Garg S, Aggarwal P, Bahurupi Y, Singh M, Kumar R. Health budget in light of pandemic: health reforms from mirage to reality. J Family Med Prim Care. 2022;11(1):1-4. doi: 10.4103/jfmpc.jfmpc_740_21, PMID 35309604.