Evaluation of Cost Analysis of Prescriptions in the Acute Medical Care Unit of a Teaching Hospital in Chennai

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Authors' contributions

This work was carried out in collaboration between both authors. Author TR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author TS managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.

Article Information

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ABSTRACT

Pharmacoeconomic evaluations provide a basis for resource allocation and utilization and are increasingly becoming important for health policy decision-making. The acute medical care unit (AMC) represents an important platform for conducting pharmacoeconomic studies as the patients are seriously ill and often suffering from chronic critical illnesses. Periodic evaluation of prescribing costs in AMCs is essential for enabling optimization of health care system, proper use of resources and for making prescription policies.

Aim: To evaluate the cost analysis of prescriptions in the acute medical care unit of a teaching hospital in Chennai.

Materials and Methods: A prospective observational cross sectional study was conducted for 5 months to evaluate the prescribing cost in the AMC of ESIC Hospital. After obtaining a verbal informed consent from the patients, data was collected in a proforma designed for the study. The

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prescriptions of the patients were analyzed from the patient medical records, for detailed information of the drugs, the dosage schedule (form, route, and frequency) and the duration of treatment from the time of admission till discharge or shifting from the AMC. The cost of prescription of each patient during their entire stay in the AMC was calculated & the data was analysed statistically.

Results: The prescription data of 130 patients was analysed. The average number of drugs prescribed per patient was 11.8 drugs. The average cost per prescription was INR 5127. The average prescribing cost was high for diseases of the central nervous system (CNS) followed by the cardiovascular (CVS) and the respiratory system (RS). The average duration of parenteral therapy was 5.63 days at an average cost of INR 5001 per patient. The average expense per patient was INR 126 with an average duration of 5.42 days for oral therapy in AMC.

Conclusion: This study revealed that the prescribing cost in AMC of our hospital is optimal as most of the drug classes were prescribed for appropriate indication and all drugs were prescribed by their generic names.

1. INTRODUCTION

Pharmacoeconomics is the description and analysis of the costs of drug therapy to healthcare systems and society [1]. Pharmacoeconomic evaluations provide a basis for resource allocation and utilization, and are increasingly becoming important for health policy decision-making [2]. Pharmacoeconomic research in the managed care system is growing. It is currently being used to make formulary decisions (complementing clinical data), design disease management programs and measuring the cost-effectiveness of interventions and programs in managed care [3].

The acute medical care unit (AMC) represents an important platform for conducting pharmacoeconomic studies as the patients are seriously ill and often suffering from chronic critical illnesses [4]. There is a high incidence of poor treatment response and adverse drug reactions increase due to the critical conditions of the patients and use of multiple medications with altered pharmacokinetic and pharmacodynamic conditions [5]. Extensive drug usage significantly raises the health care costs and also patient morbidity and mortality [6]. Due to the availability of limited funds in developing countries, drugs should be prescribed rationally so that the available funds are utilized optimally [5].

Periodic evaluation of prescribing costs in AMCs is essential for enabling optimization of health care system, proper use of resources and for making prescription policies. Hence this study was done to evaluate prescribing cost in AMC of our hospital.

1.1 Aims and Objectives

To evaluate the cost analysis of prescriptions in the acute medical care unit of a teaching hospital in Chennai.

2. MATERIALS AND METHODS

A prospective observational cross sectional study was conducted for 5 months (August to December 2016) to evaluate the prescribing cost in the AMC of ESIC Hospital. The study was conducted after getting approval from the Institutional Ethical Committee. After obtaining a informed consent from the patients, data was collected in a proforma designed for the study. The proforma included the demographic details, the diagnosis of the patient, comorbid conditions and the average stay in the AMC. The prescriptions of the patients were analyzed from the patient medical records, for detailed information of the drugs, the dosage schedule (form, route, and frequency) and the duration of treatment from the time of admission till discharge or shifting from the AMC.

2.1 Inclusion Criteria

All the patients admitted in the medical AMC during the study period were enrolled in the study.

2.2 Exclusion Criteria

Patients getting transferred to other speciality Intensive Care Units & patients discharged within 24 hours of admission were excluded from the study.

The cost of prescription of each patient during their entire stay in the AMC was calculated using the drug information book, Current Index of Medical Specialities (CIMS) & the data was analysed to calculate average & % prescribing costs.

3. RESULTS

The prescription data of 130 patients was analysed. The mean age group of admitted patients was 55 years. 60% of the patients were males and 40% were females. The average stay of patients in the AMC was 5.5 days. The average number of drugs prescribed per patient was 11.8 drugs. The average cost per prescription was INR 5127.

Though majority of the patients admitted in AMC had cardiovascular system (CVS) involvement, the average prescribing cost was high for diseases of the central nervous system (CNS) followed by the cardiovascular (CVS) and the respiratory system (RS) (Fig. 1).

Acute coronary syndrome, myocardial infarction (MI), encephalopathy, acute left ventricular failure (LVF), acute pulmonary edema & acute cerebrovascular accidents (CVAs) were the common indications for admission in AMC. The common comorbid conditions existing in these patients were diabetes mellitus, hypertension & coronary artery disease (Table 1).

The average duration of parenteral therapy was 5.63 days at an average cost of INR 5001 per patient. The distribution of parenteral therapy expenditure for various disease conditions are shown in Table 2.

Diuretics (furosemide, mannitol), anticoagulants (heparin), proton pump inhibitors (pantoprazole), beta lactam antibiotics (ceftriaxone, amoxicillin+clavulanic acid), insulin & antiepileptics (phenytoin, levetiracetam) were the drugs commonly prescribed for parenteral administration.

Table 1. Comorbid disease conditions

Comorbid disease conditions	Number of patients
Diabetes mellitus	51
Hypertension	50
Coronary artery disease	38
Chronic kidney disease	19
Hypothyroidism	9
Chronic Obstructive Pulmonary Disease (COPD)	7
Ischaemic heart disease	5
Bronchial asthma	3
Malignancy	3
Rheumatic heart disease	2
Epilepsy	1
Cirrhosis	1

Table 2. Distribution of parenteral therapy expenditure

S. no	Diagnosis	% cost
1	Encephalopathy	19.24
2	Acute myocardial infarction	13.08
3	COPD	4.51
4	Diabetic ketoacidosis (DKA)	2.21
5	Uremia	1.28
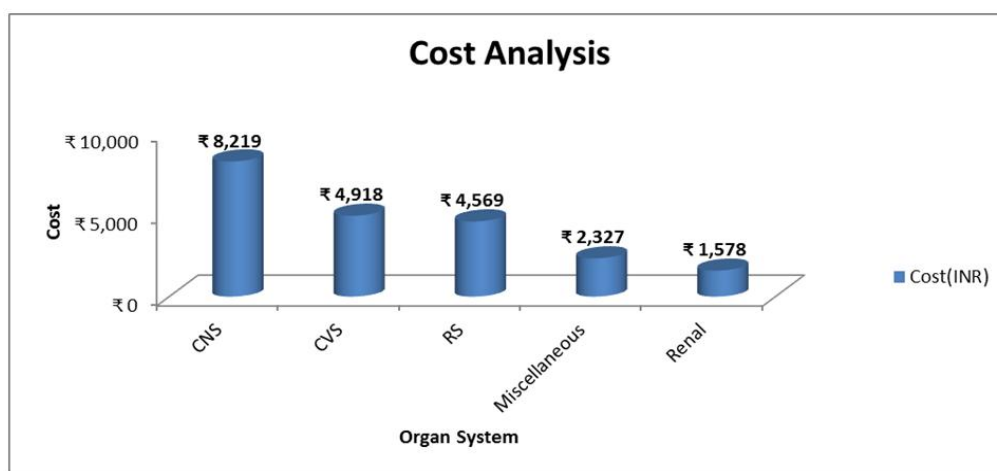
Fig. 1. Cost analysis for target organ systems
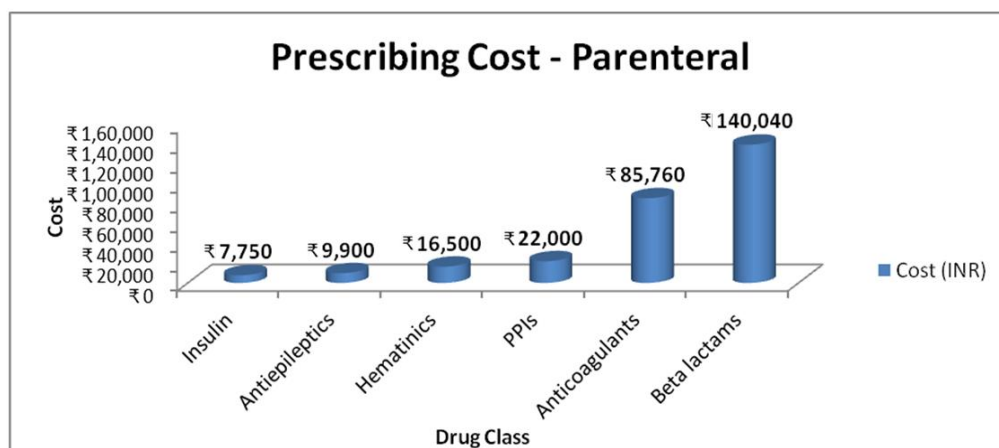
Fig. 2. Prescribing cost of parenteral therapy

Beta lactam antibiotics (cephalosporins) contributed to the maximum expenditure of parenteral drugs followed by anticoagulants though they were prescribed less frequently than diuretics & proton pump inhibitors (PPIs) (Fig. 2).

The average expense per patient was INR 126 with an average duration of 5.42 days for oral therapy in AMC. The various disease conditions for which the oral therapy expenditure was distributed are shown in Table 3.

The drugs frequently given by oral route were antihypertensive drugs (ACE inhibitors, calcium channel blockers (CCBs), betablockers), hypolipidemic drugs (statins), antiplatelet drugs (aspirin, clopidogrel), sedatives and hypnotics (benzodiazepines -BZDs), laxatives & antibiotics (fluoroquinolones, tetracyclines). All these drugs were administered concomitantly with parenteral therapy.

Among these drugs, antihypertensive drugs were the expensive drugs prescribed followed by cognition enhancers & antibiotics (Fig. 3).

All the 130 patients initially received parenteral therapy followed by oral therapy. Many drugs like PPIs, laxatives and benzodiazepines contributed to the secondary costs as they were prescribed to treat or prevent the adverse effects of other major drug classes.

Table 3. Distribution of oral therapy expenditure

S. no	Diagnosis	% cost
1	Acute CVA	22.72
2	Acute LVF	9.04
3	Acute pulmonary edema	6.78
4	Acute CKD	6.28
5	DKA	1.16
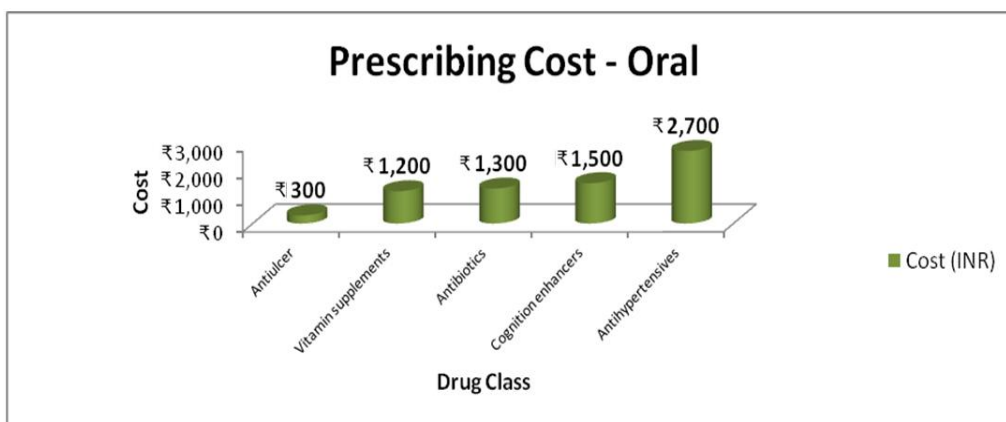
Fig. 3. Prescribing cost of oral therapy

4. DISCUSSION

This study showed male preponderance (60%) in AMC admissions which is similar to the previous studies [4,5,6]. The patients were admitted in the AMC for an average of 5.5 days which is also similar to the previous study of Patel et al. [5,7]. This is an indicator of intensive and effective treatment of patients.

Similar to previous studies, the average number of drugs prescribed per patient was 11.8 drugs [5,8] and the average cost per prescription was INR 5127. This prescribing cost is mainly on account of polypharmacy which cannot be considered irrational as multiple drug usage is essential for management of acute life threatening conditions.

The most common target organ systems involved in patients of this study were CVS and CNS which is similar to the study by Sharonjeet Kaur et al. [4] acute coronary syndrome, acute cerebrovascular accidents, MI, encephalopathy and acute pulmonary edema were the top five diseases for AMC admissions [5,8,9]. This indicates that our AMC set-up caters to a wide range of acute medical conditions [4]. Diabetes and hypertension which are assuming epidemic proportions in developing countries were the most common comorbid conditions. Drugs acting on the CVS were more frequently prescribed as parenteral and oral therapy which is in par with previous studies [4,5,10,8,11].

As in previous studies, beta lactam antibiotics constituted a major share of the average expenditure of INR 5001 for parenteral therapy since they were essential to treat systemic infections commonly seen in AMCs [4,5,6,7]. As acute cardiovascular conditions were the common indications for admissions in AMC, thrombolytic and anticoagulant drugs also contributed to the prescribing cost. Similarly antihypertensive drugs contributed to a large extent to the prescribing cost of oral therapy.

5. CONCLUSION

This study revealed that the prescribing cost in AMC of the hospital is optimal as most of the drug classes were prescribed for appropriate indication and all drugs were prescribed by their generic names. Hence, this type of economic analyses of prescriptions will help to determine the value of drugs. They are essential for health policy decision-making and they also provide a basis for resource allocation and optimal utilization. In a developing country like India, periodic pharmacoeconomic evaluations are undeniable with the rising medical costs.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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