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A prospective study on utilization of drugs in COVID 19 patients of a tertiary care hospital in Pune: A pharmacoepidemiological study

Jyoti Gadhade, Rajesh S. Hiray*, Mukthambika B and Rajesh Mailagire

Department of Pharmacology, Byramjee Jeejeebhoy Government Medical College and Sassoon General Hospitals, Pune-411001, Maharashtra, India

Abstract

Background: Pharmacoepidemiology refers to the epidemiological methods to study clinical use and effects of drugs in large number of people with the purpose of supporting the rational and cost effectiveness use of drugs. With this background, the present study was undertaken to investigate the patterns of prescriptions and drug utilization by measuring WHO drug use indicators in Covid. There are no studies done for the prescription or drug utilization pattern in Covid.
Objectives: To study the prescribing patterns of drugs used in COVID and to evaluate prescriptions according to WHO Drug Use Indicators.
Methods: This is a cross sectional, observational study. Data was collected from prescriptions of patients admitted in the COVID wards of study institution. Various parameters of utilization pattern were evaluated.
Results: Total number of prescriptions analysed were 100 in which 877 drugs were prescribed. 98.51% of the drugs were prescribed from NLEM. All the drugs were prescribed from the hospital pharmacy. Average no of drugs per prescription is 8.78. Class wise distribution of the drugs show that supplements (36.37%) were most commonly prescribed followed by antibacterial (18.35%). The proportion of use of generic name was seen in majority (89.05%) as compared to branded (10.94%).
Conclusion: It is necessary to make prescribers aware about importance prescribing and factor of cost effectiveness in patient's point of view. Also there is a need for the development of prescribing guidelines and educational initiatives to encourage the rational and appropriate use of drugs.
Keywords: Pharmacoepidemiology, Drug utilization research, COVID-19.

***Correspondence Info:**
Dr. Rajesh S. Hiray,
Professor and HOD,
Department of Pharmacology,
Byramjee Jeejeebhoy Government Medical College & Sassoon General Hospitals, Pune (MS) 411001, India

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1. Introduction

Pharmacoepidemiology refers to the epidemiological methods to study the clinical use and effects/side-effects of drugs in large numbers of people with the purpose of supporting the rational and cost-effective use of drugs in the population. It may be drug-oriented, emphasizing the safety and effectiveness of drugs as well as utilization-oriented aiming to improve the quality of drug therapy through educational interventions. So the drug utilization studies (DUS) are the powerful exploratory tools to ascertain the role of drugs in the society. Drug utilization research provides insights into various aspects of drug prescribing and drug use like pattern of use, quality of use, determinants of use and outcomes of use [1]. The World Health Organization (WHO) has defined DUS as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences. [2] Drug utilization pattern needs to be evaluated from time to time so as to increase therapeutic efficacy and decrease adverse effects. [3]

With this background, the present study was undertaken to investigate the patterns of prescriptions and drug utilization by measuring WHO drug use indicators in Covid. There are no studies done for the prescription or drug utilization pattern in Covid. No data is available keeping

these facts in consideration; the present study was planned with the aim of pharmacoepidemiological analysis of the drugs to define the pattern of use, their availability in tertiary care hospital in Pune. Pune was amongst the cities in India with highest active cases of covid in 2020.

Corona virus disease 2019 (COVID-19) is a potentially severe acute respiratory infection caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). The virus was identified as the cause of an outbreak of pneumonia of unknown cause in Wuhan City, Hubei Province, China, in December 2019 [4] The clinical presentation is that of a respiratory infection with a symptom severity ranging from a mild common cold-like illness, to a severe viral pneumonia leading to acute respiratory distress syndrome that is potentially fatal. [5]

The pandemic of corona virus disease 2019 (COVID-19) caused by the novel severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) presents an unprecedented challenge to identify effective drugs for prevention and treatment [6] Given the rapid pace of scientific discovery and clinical data generated by the large number of people rapidly infected by SARS-CoV-2, clinicians need accurate evidence regarding effective medical treatments for this infection. [7]

Aim and objectives of the study:

i. To study the prescribing patterns of drugs in patients admitted in Covid ward.
ii. To evaluate the prescriptions according to WHO drug use indicators

2. Materials & methods

2.1 Study Design: Prospective cross-sectional observational study.

2.2 Study Area: Covid ward of Tertiary Care Institute.

2.3 Study population: Patients admitted in the Covid ward of the study institute.

2.4 Sample size:100 prescriptions with established diagnosis of Corona will be assessed from Covid ward

2.5 Selection Criteria :

a) Inclusion criteria: Patients who are asymptomatic and with mild covid disease admitted in Covid Ward (age>12 or more of either sex) receiving anti covid medications.

b) Exclusion Criteria: Patients with comorbidities like Cardiovascular/Neurological/Renal diseases and patients requiring Intensive Care

2.6 Study Duration : Three months (April 2020 to July 2020)

2.7 Methodology: Institutional ethics committee approval taken. Confirmed swab test (RTPCR) positive patients are considered. Informed consent taken.

2.8 Statistical analysis: The data will be analysed using descriptive statistics (MS Excel software)

3. Results

The prescriptions were analysed for following parameters:

A. Demographic Details:- The variables that were assessed from the prescriptions included the demographic profile-

– Gender
– Age

B. WHO Drug Use Indicators:

1) Prescribing Indicators:

a) Total number of prescriptions
b) Average number of drugs per prescription
c) Percentage of dosage forms recorded
d) Percentage of encounters with an injection prescribed
e) Percentage of drugs prescribed from the National List of Essential Medicines (NLEM)
f) Percentage of drugs prescribed by generic name and branded name
g) Percentage of drugs dispensed from hospital pharmacy
h) Percentage of fixed dose combination (FDC)
i) Percentage of polypharmacy
j) Cost analysis per prescription.

2) Patient Indicators:

a) Total number of female & male patients.
– Average age of male & female patients

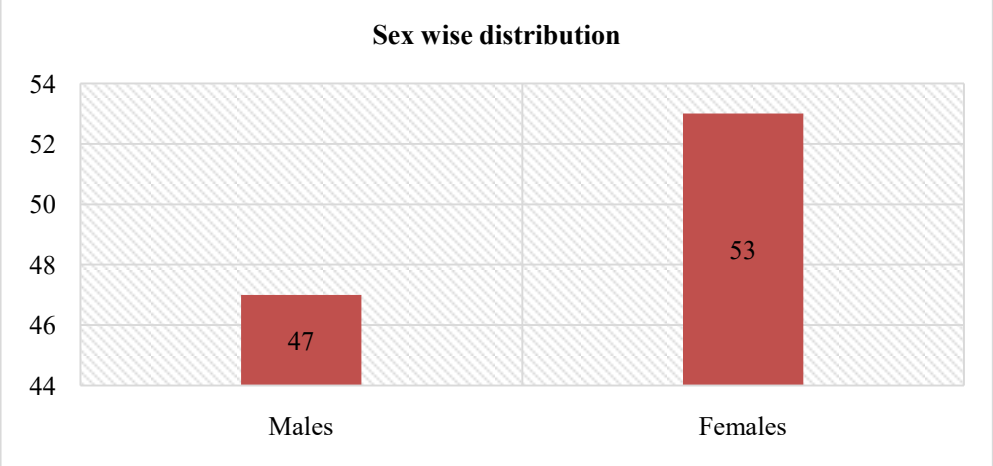


Figure 1: Females constituted majority (53%)

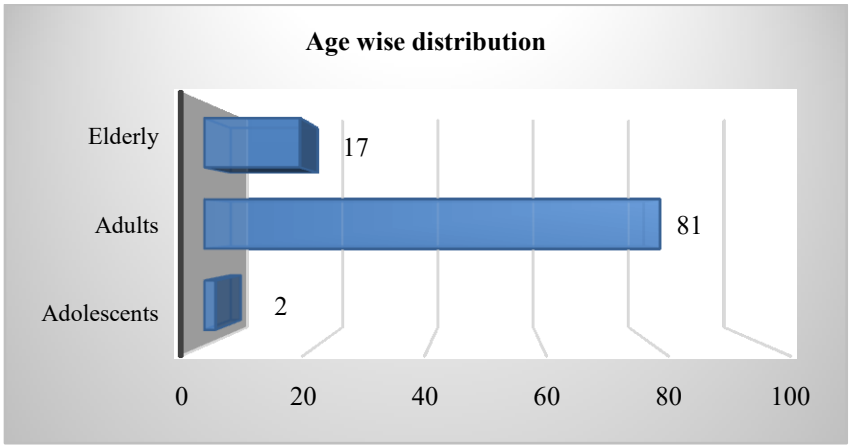
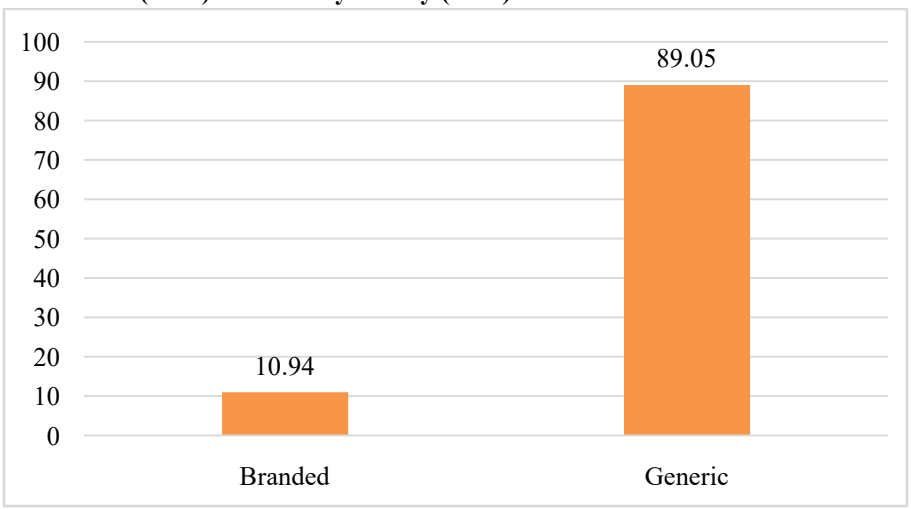


Figure 2: Age wise distribution shows majority of the patients were adults aged between 21-65 years of age (81%) followed by elderly (17%) and 2% of adolescents



The proportion of use of generic name was seen in majority (89.05%) as compared to branded (10.94%) and the difference observed was statistically significant ($P < 0.0001$).

Average number of drugs per prescription was 8.78.

Table 1: No of drugs prescribed per prescription

No of drugs / prescription	Total (%)
One	0
Two	0
Three	0
Four	1
Five	1
Six	5
Seven	37
Eight	8
Nine	9
Ten	15
Eleven	10
Twelve	9
Thirteen	3
Fourteen	2
Total	100

It was observed that once a day (BD) (76.16%) therapy was seen most commonly followed by two times a day (OD) (13.56%).

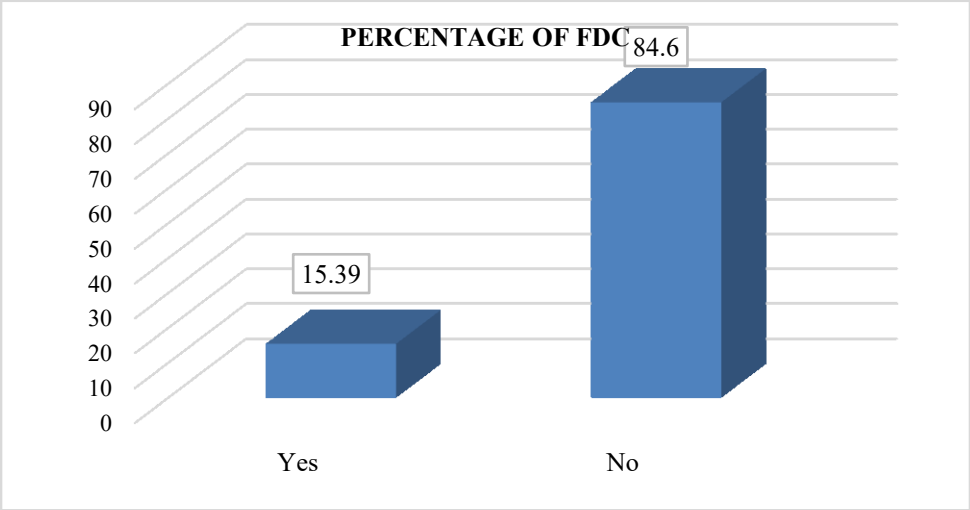


Figure 3: 135 drugs out of 877 were fixed dose combinations (15.35%)

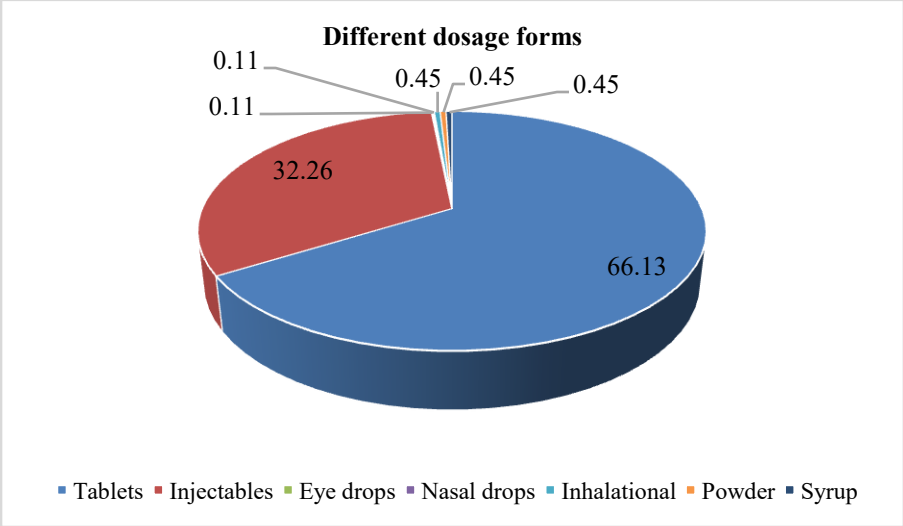


Figure 4: Pie chart showing different dosage forms

It was seen that tablets (66.13%) were used in majority followed by injectables (32.26%). Eye drops and nasal drops were used least (0.11%)

Among the tablets, most commonly prescribed were supplements (MVBC, Zinc and Vitamin C) and least common was Ciprofloxacin.

Among the injectables, most commonly prescribed was proton pump inhibitors (7.98%)

Table 2: Drug pattern utilization acc to dosage forms

Dosage forms	Drugs	Total (n=877)	Percentage
Tablets	Amoxycillin+ Clavulanic acid	61	6.95
	Pantoprazole	22	2.5
	Hydroxychloroquine	76	8.66
	Oseltamivir	63	7.18
	Vitamin C	99	11.28
	Zinc sulphate	99	11.28
	Multivitamin b Complex	99	11.28
	Calciumlactate	13	1.48
	Diclofenac	5	0.57
	Paracetamol	8	0.91
	Azithromycin	12	1.36

	Cetrizine	4	0.45
	Prednisolone	2	0.22
	Ciprofloxacin	1	0.11
	Metronidazole	32	3.64
	Ferrous sulphate folic acid	6	0.68
	Doxycycline	7	0.79
	Favipiravir	20	2.28
Injectables	Ondansetron	19	2.16
	Ceftriaxone	6	0.68
	Pantoprazole	70	7.98
	Metoclopramide	4	0.45
	Metronidazole	31	3.53
	Gentamycin	2	0.22
	Tramadol	1	0.11
	Methyl prednisolone	44	5.01
	Low mol weight heparin	44	5.01
	Piperacillin + tazobactum	39	4.46
	Vitamin B+ Folic acid	2	0.22
	Iron sucrose	1	0.11
	Amikacin	1	0.11
Powder	Lactic acid bacillus	1	0.11
	ORS	3	0.34
Eye drops	Hydroxypropyl methyl cellulose	1	0.11
Nasal drops	Sodium chloride	1	0.11
Syrup	Dextromethorphan+Chlorphenaramine	4	0.45
Inhalational	Asthalin	4	0.45

Table 3: WHO Drug Use Indicators

Type of prescribed doses	Total
Total number of prescriptions	100
Total number of drugs	877
Average no of drugs/ prescription	8.78
% of drugs dispensed from hospital pharmacy	100
% of frequency of therapy	100
% of poly pharmacy≥5 drugs	99
% of drug from NLEM	98.51
% of prescribed by brand name	10.94
% of prescribed by generic name	89.05

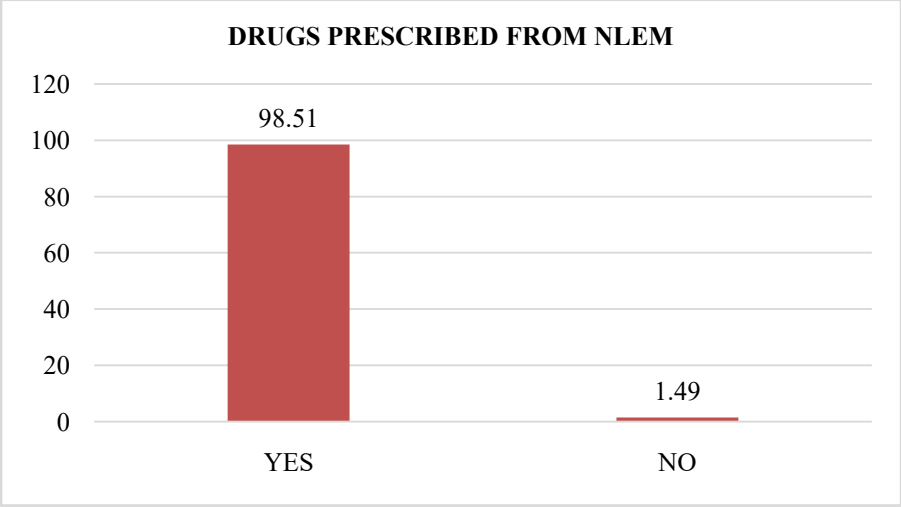


Figure 5: 98.51% of the drugs were prescribed from NLEM. All the drugs were prescribed from the hospital pharmacy.

Table 4: Class wise distribution of the drugs:

Drug Class	Total	Percentage
Proton pump inhibitors	92	10.49
Antiasthmatic	4	0.45
Antibacterials	161	18.35
Anticoagulant	42	4.78
Antidiarrhoeal	3	0.34
Antiemetic	24	2.73
Antihistaminics	4	0.45
Anti malarial	76	8.66
Antiviral	85	9.69
Nasal decongestants	1	0.11
NSAIDs	14	1.59
Probiotics	1	0.11
Steroids	46	5.24
Supplements	319	36.37

Class wise distribution of the drugs show that supplements (36.37%) were most commonly prescribed followed by anti bacterials (18.35%)

4. Discussion

By conducting DUS we obtain data about the patterns and quality of use, the determinants of drug use, and the outcomes. The WHO drug use indicators are highly standardized and are recommended for inclusion in DUS. [8] Our study was an attempt to describe the drug prescribing pattern in a tertiary care teaching hospital in Western India. The WHO core drug use indicators were used to primarily describe the drug use, particularly the prescribing indicators.

The indicators of prescribing practices measure the performance of health care providers in several key dimensions related to the appropriate use of drugs.

In our study, prescriptions with generic name were 89.05%, which suggests the confidence in quality of generic drugs considering the socioeconomic condition of the patients in tertiary care centre. Prescriptions of generic drugs facilitate cheaper treatment for the patient. [7,8]

The high uses of antibiotics reflect the condition of poor sanitation, nutrition and prevalence of various infections and for some other acute infective conditions which needs conservative management.

Strength

This is the first study in documenting the drug utilisation pattern in covid-19 era.

Limitation

Since this was a quantitative type of drug utilization study with the WHO/INRUD core prescribing indicators, determining the quality of diagnosis and the appropriateness of drug choices was beyond the scope of prescribing indicators.

5. Conclusion

DUS has become a vital part of pharmacoepidemiology. It provides the insights into various aspects of drug prescribing and drug use like pattern of use, quality of use, determinants of use and outcomes of use. Therefore periodical auditing of drug utilization pattern is crucial for promotion of rational use of drugs, for increasing the therapeutic efficacy and the cost effectiveness, for decreasing the adverse effects and to provide feedback to the prescribers.

No proven effective therapies for this virus currently exist. The rapidly expanding knowledge regarding SARS-CoV-2 virology provides a significant number of potential drug targets.

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