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# DECCAN PHARMA JOURNAL SERIES

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(Research Article)

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## POLYPHARMACY LEADING TO ADVERSE DRUG REACTIONS IN ELDERLY PATIENTS: A REVIEW OF THREE CASE STUDIES

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### ABSTRACT

Polypharmacy is a multiple medication for treatment of patient's medical conditions and which is commonly observed in elderly patients due to multiple diseases suffering. The present review work includes study of different locations of India done by different investigators. In this study we discussed about the adverse drug reactions occurring in the elderly as a result of polypharmacy. Total 1321 patients aged  $\geq 60$  years and prescribed more than 6 drugs were included in the study. Adverse drug reactions were mainly seen in 20 % of patients. 95 patients were prescribed potentially harmful drugs according to Beer's list. To conclude, polypharmacy was seen in majority of elderly patients. Though the number of drugs per prescription was high, use of injections and antibiotics were limited. Management of prescribing generic and branded drug should be improved. It also indicates that there is need for improvement of role of physician and pharmacist.

### Keywords:

Polypharmacy, Elderly patients .

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## INTRODUCTION

Polypharmacy is defined as concurrent use of multiple medications, greater than five by a single patient. Polypharmacy is a common occurrence in elderly patients due to a variety of reasons like increasing number of chronic health conditions, patients being treated by multiple prescribing physicians, availability of nonprescription drugs, high cost of prescription medications, hoarding of old medications, inadequate patient knowledge of medications and medical conditions, patients using different sources of medication, often with little or no coordination between these sources, taking at least one medication for every diagnosis and tendency toward self-treatment/self-medication.

Adverse drug reactions are most frequently observed among the elderly. Responsiveness to drugs is modified among the elderly due to age-related changes such as decline in renal and liver function, hypoalbuminemia, reduced body weight, and multi-morbidity which may increase the risk of polypharmacy leading to high frequency of adverse drug reactions among the elderly. Polypharmacy increases the incidence of adverse drug reactions (ADRs),

drug interactions, non-compliance which in turn leads to increase in hospital admissions and thus increases the health expenditure. Inappropriate prescription of medications in elderly due to wrong dosing, incorrect frequency of administration, prescribing ineffective medication, prescribing the wrong medication and duplicate therapy also leads to many ADRs. About one fourth of the ADRs are due to inappropriate prescriptions in elderly. Indian prospective studies focusing on polypharmacy resulting in adverse drug reactions in elderly is lacking. Therefore, the present study was designed to study the polypharmacy leading to adverse drug reactions in elderly.

## METHODOLOGY

The methodology includes case studies of three research paper in this area. Literature Survey reveals that prospective observational hospital based study. This study comprises three studies which were conducted in different hospitals located in different areas of India such as Bangalore, Mysore, Madhya Pradesh, Ahmadabad, Maharashtra etc. Patients records, medication history and where appropriate, discussion with the patient, patients

attendants and physicians formed the source of data. About 1321 in patients in the department of medicine were included in the study. The entire study procedure was explained to the patients who volunteered and fulfilled the selection criteria. The patients were selected based on the following criteria.

Inclusion criteria

2. Patient's  $\geq 60$  years.
3. Elderly patients who are on more than 5 drugs.
4. Patients who voluntarily gave informed consent.

Patients who did not give voluntary informed consent.

The demographic data including in-patient number, name, age, sex, address, date of admission, date of discharge and complete medical history was recorded. The drug details which includes name of the drug, dosage, duration of therapy, route of drug administration, reasons for polypharmacy, previous medication history were recorded. Details of ADRs with causal drugs were also recorded.

The details of drugs collected were analyzed

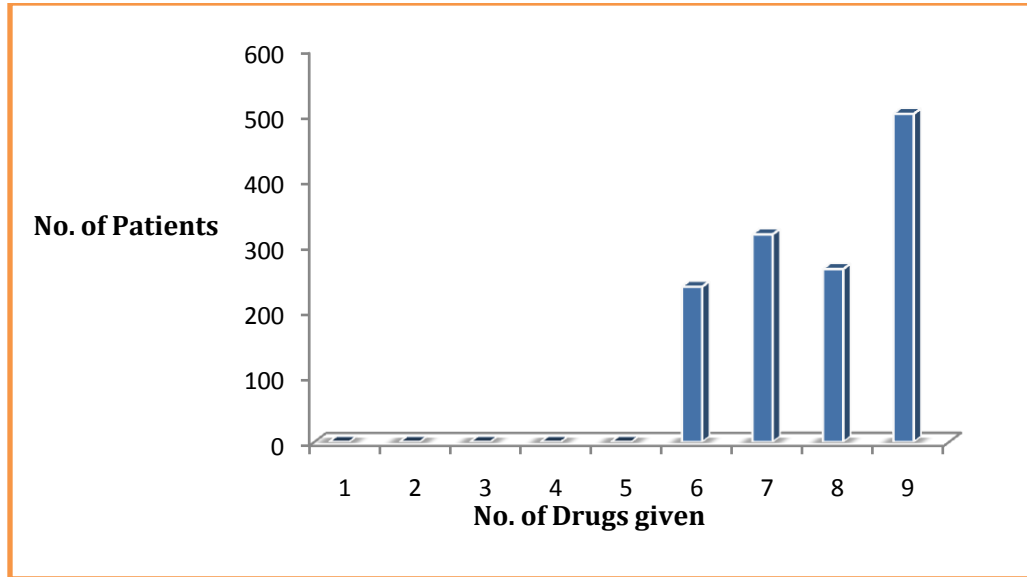
according to WHO indicators for the following.

1. Number of drugs per prescription
2. Number of drugs prescribed by generic name
3. Number of drugs prescribed from WHO model list of essential medicine
4. Number of injections per prescription
5. Number of antibiotics per prescription

## RESULTS & DISCUSSION

Our compiled study of three case studies revealed that 1321 patients who satisfied the selection criteria were included in the study of which 768 were males and 553 were females. About 822 patients were in the age group of 60-69 years, 376 in the age group of 70-79 years, 123 patients in the age group of more than 80 years.

The study showed that 237 of the patients received six drugs, 317 of the patients received seven drugs, 264 of the patients received eight drugs and 501 received nine drugs. Graphical Representation mentioned in Fig. No1

**Fig. 1 Graphical representation of Polypharmacy****Fig. 1 Graphical representation of Polypharmacy**

Patients admitted with respiratory disorders, cardiovascular disorders and central nervous system disorders and Diabetic disorder.

The list of potentially harmful drugs prescribed for elderly as mentioned in Beer's list is given in most commonly

prescribed drugs in elderly is as shown in Table No. 1. Most commonly prescribed drug was ranitidine (78%), followed by cefotaxime (48%), salbutamol (40%) and deriphylline (32%).

**Table No. 1*****Most commonly prescribed drugs***

Name of the drug	No. of Patients (%)
Ranitidine	78
Cefotaxime	48
Salbutamol	40
Deriphylline	32
Diuretic (Hydrochlorothiazide)	26
Paracetamol	22
Amlodipine	18
Aspirin	18

Plain insulin	16
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Adverse drug reactions noted in the study are mentioned in Table No. 2 Only certain and probable adverse drug reactions were taken for analysis. Adverse drug reactions

were mainly seen for insulin (16%), followed by amlodipine (18%) and digoxin (05%)

**Table No 2**

*Drugs which caused adverse drug reactions.*

Adverse drug Reaction	Drug responsible	No. of patients (%)
Tremors	Salbutamol	3
Palpitation	Digoxin	2
Sedation	CPM	1
Cough	Enalapril	1
Epistaxis	Acenocoumarol	1

**CONCLUSION**

This study has shown that majority of the elderly patients received more than six drugs. Polypharmacy was associated mainly with respiratory disorders in elderly. Though the number of drugs per prescription was high, use of injections and antibiotics was limited. There is a scope for improvement in prescribing by generic name and opting drugs from WHO essential drug list. The use of inappropriate medications in elderly was minimal. But ADRs to many commonly used drugs and significant drug-drug interactions were

noted which indicates the need for improving the awareness of physicians about prescribing in elderly. More prospective studies are required in Indian hospitals to assess the burden of ADRs in elderly. There is also a need for mass awareness among the physicians and patients about the concept of rational use of medications. Drug information services also should be set up in the hospitals to provide information about adverse effects and drug-drug interactions to the physicians. Awareness about reporting ADRs in India also needs to be improved.

### Role of Pharmacist in Polypharmacy

1. Need for improving the awareness of physicians about prescribing in elderly patients.
2. Educational programs should be conducted to improve the habit of prescribing rationally by the prescribers.
3. To maintain an accurate medication and medical history.
4. To check is medication match with patient diagnosis.
5. To identify medication that is treating side effects.
6. Suggest to patient for using combination products.

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