

An Effect of Polypharmacy on Medication Adherence in Geriatrics in a Tertiary Care Teaching Hospital

Bandri Sudhindra Kasyapa*, Dumthi Namratha*, Syed Mohammed Hussaini *,
Meghana K R*, Dr. Chitra Hasini**

*Student, **Assistant Professor,

Department of Pharmacy Practice, TVM College of Pharmacy, Ballari, Karnataka, India.

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ABSTRACT

Introduction: Polypharmacy is most commonly defined as the use of four or five or more medications daily by an individual. Medication adherence where prescribed medications are taken at the right dose and right time in manner specified has been shown to improve health outcomes and reduce health care cost .

Objective: The main objective was to find out effect of polypharmacy on medication adherence in geriatrics in a tertiary care teaching hospital

Method: It was a prospective observational study conducted for six months period in which 136 sample size were included of age more than 60 years of both gender having more than 5 drugs in their treatment charts.

Result: Out of 136 patients 83(61%) were males and 53(39%) were females. Out of 136, 83 were of age group 61-80 years and 53 were of age group 81-100 years. Total number of co-morbidities were 213 in number. 78 prescriptions were containing 5-10 drugs, 58 prescriptions contained 10-20 drugs. 42 patients were adherent and 94 patients were non adherent. 79 major interactions and 23 minor interactions were found in 136 prescriptions.

Conclusion: We may conclude that clinical pharmacist can play an important role in improving the quality of life of geriatric patients by explaining them importance about the medication adherence. By helping patients regarding drug regimen by reducing the pill burden, making the patient to understand benefits of medication use.

Keywords: Polypharmacy, Medication Adherence, Geriatrics, Prescription, Co-Morbidity.

I. INTRODUCTION

Polypharmacy is defined as use of 5 or more medications on daily basis. It is generally defined as definite number of drugs used to treat 'n' number of disease in an individual.

Inappropriate use of drugs can cause adverse reaction and poor outcomes in older adult. Managing polypharmacy is challenging. Some barriers are lack of time , poor health care setup , negligence etc. These problems can be reduced by introducing clinical pharmacy services. Multi morbidity i.e combination of 2 or more chronic health diseases in older population. More the complications more the complex will be the treatment for physician as well as patients.

Medication adherence is defined as administration of right drug at right dose, right frequency, right patient at right time. Poor medication adherence may lead to worsening of health outcomes in patients and high rates of morbidity and mortality.

Medication adherence is a key treatment outcomes, the long term adherence can be calculated using some scales.

To assess the medication adherence some tools can be used .Some of them are listed below:

- **Reminder chart :** It helps the patient as when to take, quantity to take, route of administration, start and end dates.
- **Pill card:** This helps to put the reminder chart in portable form.
- **Educational videos:** Here the effectiveness of the medicines when taken at proper time, dose, frequency is explained by using some educational videos.
- **Pill organizer:** This box have separate sections with labelling as on what day what medication should be taken.
- **Digital dispenser:** It is also called as enhanced pill organizer.
- **Timer:** It marks alarms when there is time to take medicines by the patient.

Medication adherence can also be assessed using Patient Reported Outcome Measures(PROMs). Here the outcomes can be measured by getting direct outcomes from the patients.

Scales:

- Dysphoryx Response Index(DRI)
- Drug Attitude Inventory(DAI)
- Medication Adherence Questionnaire (MAQ)
- Clinical Rating Scale(CRS)
- Medication Adherence Rating Scale (MARS)

It is estimated that upto 50% of patients dont adhere to the given medicines or take less doses than prescribe one or discontinuing treatment.

Multiple factors influencing patient adherence to prescribed therapies include demographic, treatment, clinical and variable behaviour.

This implies that medication adherence plays important role in improving health outcome of patients.

II. MATERIALS AND METHODS

A prospective observational study was conducted in Vijayanagara Institute of Medical Sciences, Ballari, Karnataka for the duration od six months among 136 patients.

STUDY CRITERIA:

Inclusion Criteria:

- Patient of age more than 60 years
- Patients of both genders are included

- Patient with past medical history like hypertension, Diabetes Mellitus, epilepsy, Tuberculosis, Stroke etc.
- Prescriptions with more than 5 medications.
- Patient who was willing to participate in the study.

Exclusion Criteria:

- Patients of age below 60 years.
- Out patients.
- Prescriptions with less than 4 drugs.
- Emergency department.

MATERIALS USED:

- Patient Profile Form
- Informed Consent Form
- Patient Counselling Form
- MMAS-4 Form
- 10-Scale Medication adherence

III. RESULTS

A Prospective observational study conducted for 6 months among the inpatients in Vijayanagara institute of medical sciences, Ballari, Karnataka. A total no. of 136 patients have participated during the study period. Out of 136 subjects 83 (61%) were male and 53 (39%) were female.

Table 1: Distribution of Patients According Gender

GENDER	TOTAL NUMBER (n=136)	PERCENTAGE
MALES	83	61%
FEMALES	53	39%

Figure 1: Distribution of Patients According Gender

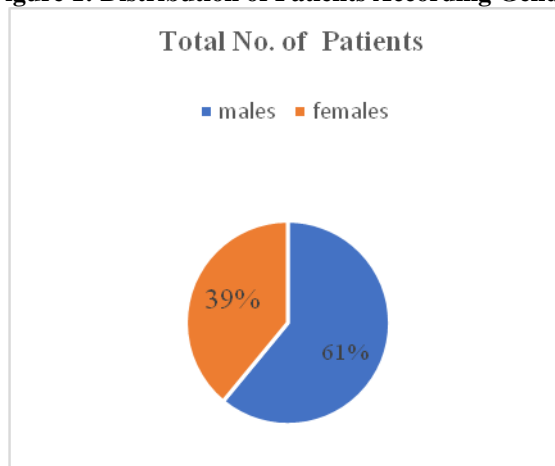


Table 2: Distribution of Patients According to Age

Among 136 patients, patients with age group of 60 - 80 was (83) higher than the age group of 80-100 was (53)

AGE GROUP (in years)	MALE (n=83)	FEMALE (n=53)	TOTAL (n=136)
61-80	75	40	115
81-100	8	13	21

Figure 2: Distribution of patients according to Age

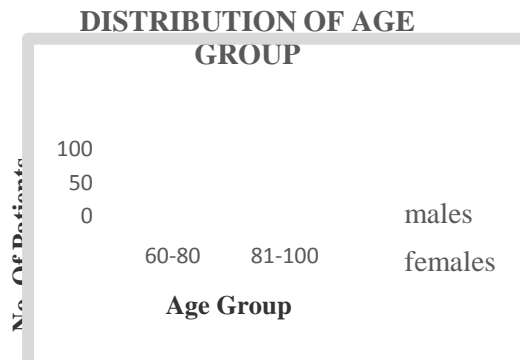


Table 3: Distribution of Patients and co –morbidity

Among 136 patients, there were 213 co –morbidity such as endocrine, cardio vascular, renal, respiratory ,infectious, neurological, immunological disorders

DISORDERS	NUMBER	PERCENTAGE
Endocrine	24	11%
Cardio vascular	40	18%
Renal	37	17%
Respiratory	29	13%
Infectious	40	18%
Neurological	16	7%
Immunological	18	8%
Others	9	4%

Figure 3: Distribution of Patients and Co- Morbidities :

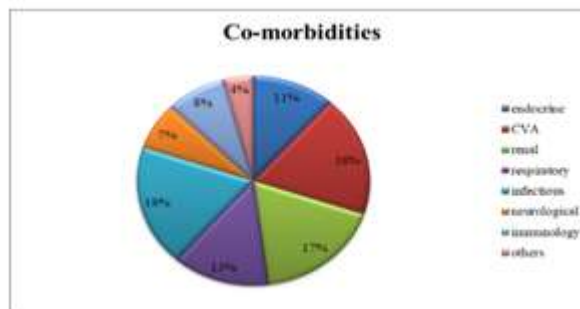


Table 4: Number of drugs in treatment chart

In our study, among 146 patients 53(36%) patients were admitted without co-morbidities among them 39 (74%) were male and 14 (26%) were female.

NUMBER OF DRUGS	NUMBER OF PRESCRIPTIONS	PERCENTAGES
5-10	78	57%
10-20	58	43%

Figure 4: Distribution of patients according to number of prescriptions

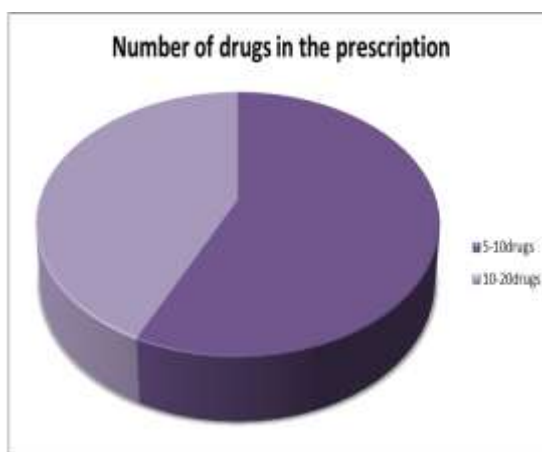


Table 5: Distribution of Patients According To Adherence And Non Adherence Based On MMAS-4

In this study we had calculated the level of adherence by using MMAS-4. For the variable YES-0 and variable NO-1. On an average of 4

points we differentiated among adherent and non adherent patients.

Among 136 subjects ,42 patients were adhered to the medication as prescribed by the physician and 94 patients were not adhered to the medication because of the individual reasons.

LEVEL OF ADHERENCE	NUMBER OF PATIENTS	PERCENTAGE
ADHERENT	42	30%
NON-ADHERENT	94	70%

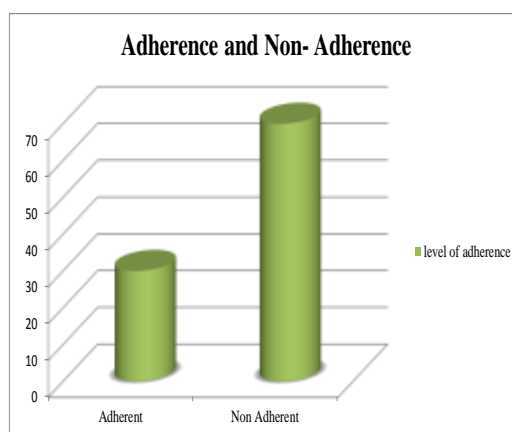


Table 6: Distribution of Patients according to number of interactions

Among 136 prescriptions, we had identified 79 major drug –drug interactions and 23 moderate drug-drug interactions

INTERACTION	NUMBER OF INTERACTIONS
MAJOR	79
MODERATE	23

Figure 6: Distribution of patients according to number of interactions:



Table 7: Examples of drug interactions

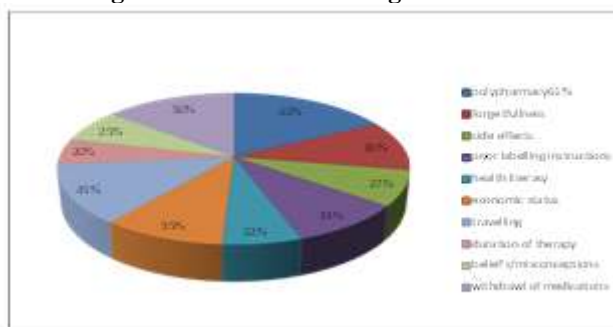
Sl. no	MAJOR	MODERATE
1	Aspirin+clopidogrel	Atorvastatin+clopidogrel
2	Enalapril+telmisartan	Aspirin+Enalapril
3	Aspirin+Furosemide	Aspirin+Carvedilol
4	Metronidazole+Ondansetron	Aspirin+Bicarbonate
5	Ciprofloxacin+Amlodipine	Carvedilol+Clonidine
6	Clopidogrel+Amlodipine	
7	Atorvastatin+Diltiazem	
8	Doxycycline+Pipz	

Table 8 : Factors affecting the adherence

REASONS	NO OF RESPONSES	PERCENTAGE
Polypharmacy	83	61%
Forgetfulness	52	38%
Side effects	37	27%
Poor labelling instructions	46	33%
Health literacy	30	22%
Economic status	48	35%
Travelling	62	45%
Duration of	28	20%

therapy		
Beliefs\ misconceptions	34	25%
Withdrawal of medicines	69	50%

Figure 8 – Factors affecting adherence :



IV. DISCUSSION:

- In our study patients taking drugs < 10 were 78 and patients taking drugs 10-20 were 58. This is compared with Xiaoxing Lai et al¹⁰ their result were for , 10 drugs was 55 and patients taking drugs 10-20 were 46 .
- In our study the level of adherence among the patients was 30% is analysed with Juliana Martins Ribeiro Valassi et al² their result for level of adherence 50%.
- In our study the patients with age between 60-80 years was 84.5% and patients of age above 80 years was 15.5% which is identical with R Shruithi et al⁴ their result were age 60-80 year was 95.61% and age above 80 years was 4.78%
- In our study males were 61% and females were 39% . This is in contrast with Yu Ting Li et al⁶ their result for male is 45.8% and for female is 54.2%.
- In our study males were 83 and females were 53 which is analysed with Ramanath KV et al⁷ their result for male is 107 and females is 56

V. CONCLUSION

- Polypharmacy is defined as the use of five or more medication by an individual per day. Now a day polypharmacy has become a burden for the older adults to administer more number of drugs. Thereby the treatment success is often delayed or reduced, which in term increases the length of hospital stay and duration of health outcomes.
- According to some recent studies polypharmacy is the leading factor behind the

failure of the treatment by causing the interactions, ADR's and non-adherence. Non-adherence is the primary reason behind the delayed outcome or the treatment failure.

- This study shows the reduced medication adherence among the geriatric patients. By helping the patient regarding the drug regimen or reducing the pill burden, making the patient to understand regarding the benefits of medication use should be the major target for the clinical pharmacist.
- As the patients in this study has a difficulty in following the medication adherence, by giving the appropriate medications for comorbidities present, prescribing the best treatment option can help the patient to achieve a proper level of medication adherence.
- However the polypharmacy is the commonest problem among the geriatrics due to much comorbidity, we aim to increase the medication adherence in the patients and make sure that treatment is a success and thereby it reduces the duration of hospital stay, increases health outcomes and betterment of life.

STRENGTHS AND LIMITATIONS

STRENGTHS:

- This study helps to identify the level of adherence among the geriatric patients by using MMAS-4
- By using this study, we can provide the patient counseling regarding drug use.
- By using 10-scale questionnaire the problems related to the medication non adherence can be resolved by counseling the patients.

- This study explains about the proper medication use to the geriatrics for their better quality of life.

LIMITATIONS:

- Some of the subjects refused to follow the medication adherence because of the unintended adverse effects of drugs like nausea, gastric irritation, constipation etc
- Follow up of the patients was difficult because of the unintimated discharges from the hospital.
- In this study we did not use any types of medication adherence tools.

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