



A STUDY ON POLYPHARMACY AND POTENTIALLY INAPPROPRIATE MEDICATION USE AMONG ELDERLY INPATIENTS AT A TERTIARY CARE HOSPITAL IN KERALA, SOUTH INDIA

General Medicine

Anagha Haridas

Final Year MBBS Student, Amala Institute of Medical Sciences, Thrissur, Kerala, India

Dr. Anish S*

Assistant Professor; Department of Medicine, Amala Institute of Medical Sciences, Thrissur, Kerala, India. *Corresponding Author

ABSTRACT

The proportion of elderly population has been constantly increasing over last few years. Polypharmacy is unavoidable in the elderly as they usually suffer from multiple co-morbidities. Polypharmacy and potentially inappropriate medication use among the elderly must be carefully assessed in order to reduce the morbidity and mortality in this vulnerable population. **Objectives:** 1. To assess the extent of drug use in hospitalized elderly patients in Medicine Department of AIMS Thrissur. 2. To evaluate inappropriate drug prescribing with the help of Beers Criteria 2015 **Methods:** This was a descriptive cross sectional study done on 100 patients above 60 years of age admitted to medical wards of AIMS Thrissur. Data was collected using structured proforma and by interviewing the patients. Information included sociodemographic data, chronic diseases, medications administered in regular, in-patient and discharge prescriptions. **Results:** Among 100 patients, 51% had polypharmacy in regular prescription (mean 4.87 ± 3.999), 95% in inpatient prescription (mean 12.86 ± 5.673) and 93% in discharge prescription (mean 9.10 ± 5.673). There was a significant association between polypharmacy and history of fall, multimorbidity and education status. Potentially inappropriate medication use was seen in 46% of study subjects. PIM use was 22% in regular prescription, and 38% each in inpatient and discharge prescriptions. Most common PIM use in regular prescription were Digoxin, Hydrochlorothiazide and Tamsulosin (in patients with history of fall). Benzodiazepines were the most common PIM in inpatient and discharge prescriptions. There was significant association between Polypharmacy and PIM use. **Conclusion:** Polypharmacy and PIM use is common among elderly population. To improve drug safety in this high-risk population, appropriate prescribing is very important. Physicians should be more aware of the Beers criteria when treating the elderly. Geriatric pharmacotherapy should be emphasised in undergraduate and postgraduate curriculum to create a generation of doctors well equipped to avoid inappropriate prescribing.

KEYWORDS

Polypharmacy, Inappropriate prescribing, Elderly, Beers criteria

1. INTRODUCTION-

Ageing is a biological reality which is beyond human control. Proportion of the elderly people have been constantly increasing in the last few years as a result of increasing life expectancy. The projected life expectancy in India by 2025 is 69.8 years for men and 72.3 years for women¹.

As the age advances there is increased chance of Polypharmacy, which leads to decreased quality of life, physical problems, increased drug interactions, side effects, and medical problems and also increases the cost of treatment²⁻⁴. With the increase in comorbidities and further use of medications, there is a greater chance of potentially inappropriate medication use. Beers et al⁵ have put forward a criteria for classifying a drug as inappropriate for use in elderly patients. Several studies have reported use of potentially inappropriate medications (PIM) in elderly people based on Beers criteria.^{6,8}

2. OBJECTIVES-

1. To assess the extent of drug use in hospitalized elderly patients in Medicine Department of AIMS Thrissur
2. To evaluate inappropriate drug prescribing with the help of Beers criteria 2015

3. METHODOLOGY-

This was a descriptive cross sectional study done on 100 patients above 60 years of age admitted to medical wards of Amala Institute of Medical Sciences, Thrissur, Kerala during a period of 2 months. All elderly patients (≥ 60 years) admitted to and discharged from wards under Department of Medicine with a length of hospital stay > 48 hrs were included. Patients unwilling to participate due to any reasons, death of the patients before discharge, patients with active malignancy as diagnosis, patients discharged against medical advice, patients taken over to other departments were excluded. Ethical clearance was obtained from Institutional Ethics Committee. Data was collected using a structured proforma after getting written informed consent.

Medications were classified into different categories based on Anatomical Therapeutic Chemical Classification System. In this study, Polypharmacy was defined as the state in which five or more medications are taken concurrently.^{2,4} Multimorbidity was defined as presence of 2 or more chronic diseases. Potentially Inappropriate Medications were defined as, medications or medication class that should be avoided in persons 60 years or older because they are either ineffective or they pose unnecessary higher risk to older persons and

safer alternative is available⁵. Sociodemographic data, history of fall, chronic diseases and regular prescription were collected by interviewing the patients. Inpatient and discharge prescriptions were obtained by case sheet review on the day of discharge. Regular, inpatient and discharge prescriptions were audited for polypharmacy. Potentially inappropriate medications were identified using Beers criteria. The collected data was compiled in the Microsoft Excel data sheet and analysed with appropriate statistical technique using SPSS software version 23.

4. RESULTS-

The present study was conducted on 100 patients (50 males and 50 females). The mean age was 72.13 ± 6.662 years. Half of the study subjects were living with spouse and children and about one third with their children. More than 2/3rd of the subjects were educated till secondary level and were financially dependent on their children. The average length of hospital stay was 6.61 ± 4.35 days. 40% had history of fall in past 6 months. Multimorbidity was present in 85% of study population. The most prevalent comorbidities were systemic hypertension (81), type 2 diabetes mellitus (52), coronary artery disease (33), cerebrovascular disease (30), chronic kidney disease (22) and COPD (21). Antihypertensives, Antithrombotics & Vasoprotectives and medications used for diabetes were the most common category of drugs administered in regular prescription. Alimentary tract and Metabolic drugs, Antihypertensives and drugs for obstructive airway diseases were the most commonly administered drugs in inpatient and discharge prescriptions.

Prevalence of polypharmacy in regular, inpatient and discharge prescriptions were 51%, 95% and 93% respectively. Mean number of drugs administered in regular, inpatient and discharge prescriptions were 4.84 ± 3.39 , 12.86 ± 5.67 and 9.10 ± 5.67 respectively. There was a significant association between polypharmacy and history of fall, multimorbidity and education status.

Table 1 : Clinical and demographic characteristics of study subjects

Variables		Frequency (n)
Age (years)	≤ 70	48
	71-75	29
	76-80	11
	81-85	5
	≥ 86	7

Residential status	Lives alone	5
	With spouse	12
	With spouse and children	51
	With children	32
Education level	Primary	15
	Secondary	64
	High school	13
	Graduate	7
Financial status	Post graduate	1
	Dependent	67
	Partially dependent	19
Length of stay	Independent	14
	≤5	49
	6-10	35
	11-15	3
History of fall in past 6 months	≥15	13
	Present	44
	Absent	56
Multimorbidity	Present	85
	Absent	15
No of drugs (regular prescription)	5-10	37
	>10	14
No of drugs (inpatient prescription)	5-10	28
	11-20	56
	>20	11
No of drugs (discharge prescription)	5-10	67
	>10	26
PIM use (regular prescription)	Present	22
	Absent	78
PIM use (inpatient prescription)	Present	38
	Absent	62
PIM use (discharge prescription)	Present	38
	Absent	62

Potentially inappropriate medication use was seen in 46 % of study subjects. PIM use was 22% in regular prescription, and 38 % each in inpatient and discharge prescriptions. Most common PIM use in regular prescription were Digoxin ,Hydrochlorthiazide and Tamsulosin (in patients with h/o fall). Benzodiazepines were the most common PIM in inpatient and discharge prescriptions. PIM use was significantly associated with history of fall, which is a geriatric giant. Polypharmacy was significantly associated with PIM use.

Table 2- Categorisation of medications based on Anatomical Therapeutic Chemical Classification System and frequency of use

Category of drugs	Regular Prescrip-tion (n)	Inpatient Prescrip-tion (n)	Discharge Prescrip-tion (n)
Anti-inflammatories-antirheumatics&analgesics	7	21	6
Anti-hypertensives	79	82	77
Medications used for diabetes	40	34	43
Drugs used for central nervous system	21	29	32
Lipid modifying drugs	36	44	47
Antianemic preparations	14	18	21
Alimentary tract and metabolism drugs	30	83	87
Drugs used for bone diseases	8	15	10
Drugs for obstructive airway diseases	21	63	57
Antithrombotic agents and vasoprotectives	43	46	46
Antineoplastic& immunomodulatory agents	0	1	1

Table 3 : Distribution of PIM use in regular, in patient and discharge prescriptions

Potentially Inappropriate Medication	Regular prescription (Frequency = n)	Inpatient prescription (Frequency = n)	Discharge prescription (Frequency = n)
Benzodiazepines	0	6	6
Multivitamins	0	1	4
Amitriptyline	0	1	1

Digoxin	2	2	2
Nifedipine	0	0	1
Clonidine	1	2	2
Trihexaphenidyl	0	1	1
Hydrochlorothiazide	2	1	1
Amiodarone	1	1	1
Bethanacol	0	0	0
Diuretics+Tamsulosin	0	0	1
Prazosin +Furosemide+Nitrate	1	1	1
Diuretics+H/o fall	1	2	2
Diuretics +Tamsulosin+Nitrate	0	1	1
Tamsulosin +H/o fall	2	2	2
Amiodarone+Warfarin	1	1	1
Tamsulosin+Nitrate	1	1	1
Hydralazine+H/o fall	0	1	1
Diuretics+ Nitrate	1	1	0

5.DISCUSSION-

This cross sectional study done on 100 hospitalised elderly patients observed significant multi morbidity, polypharmacy and PIM use. Polypharmacy was higher in the inpatient and discharge prescriptions as compared to the regular prescription. With increasing multimorbidity in the elderly, this is expected as more number of medications in various combinations will be used during hospital stay. This could result in more drug-drug interactions and inappropriate drug prescribing.⁹ PIM use was higher in the inpatient and discharge prescriptions as compared to regular prescription, congruent with the polypharmacy observed.¹⁰ Close to half of the study subjects had atleast one PIM use, which is an alarming proportion. Beers criteria has been used by many researchers to identify PIM use in elderly population. The present study throws light on the importance of popularising its use among generalists as well as specialist doctors because multiple prescriptions from multiple doctors could result in more pill burden and drug interactions. The aim of drug prescribing in elderly should be to reduce pill burden, weigh risk versus benefit and decide the appropriateness of prescription on a case to case basis. A vigilant auditing of drug prescription using Beers criteria is important to avoid inappropriate drug use in a population which is special and vulnerable. Geriatric education especially with regard to pharmacotherapy in elderly should be given emphasis in undergraduate as well as postgraduate curriculum to create a generation of doctors well equipped to avoid inappropriate prescribing.

6.CONCLUSION-

Polypharmacy and PIM use is common among elderly population. To improve drug safety in this high-risk group, appropriate prescribing is very important. Physicians should be more aware of the Beers criteria when treating the elderly. Education in geriatric pharmacotherapy should be emphasised to create a generation of doctors well equipped to avoid inappropriate prescribing in this special and vulnerable population.

7.REFERENCES-

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