

Evaluation of Polypharmacy and Appropriateness of Prescription in Respiratory Associated Diseases among Geriatric Patients in a Tertiary Care Hospital: A Cross-Sectional Study

Anns Abraham¹, Ankit Kumar², Ranjeet Kumar³

^{1,2}(Department of pharmacy practice, Nims Institute of Pharmacy, India)

³(Head of the department, Department of pharmacy practice, Nims Institute of Pharmacy, India)

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Abstract:

Background: Polypharmacy has always been a challenge to geriatric patients. There is a sharp increase in the elderly population in India. Due to age related problems and comorbid conditions polypharmacy is common in elderly patients. Therefore it has always been important to assess the impact of polypharmacy in geriatric population.

Materials and method: In this prospective observational study a 100 patients (>60 years) of either gender were selected from the general medicine ward with respiratory associated disease. Medication appropriateness for each patient was analyzed separately based on their medical history and clinical findings by applying a screening tool to alert to right treatment (START) and screening tool of older people's potentially inappropriate prescriptions (STOPP) and Beers criteria.

Results: Out of 100 geriatric patients, 73 (73%) were males and 27 (27%) were females. Polypharmacy was seen in 86 prescriptions (86%). Highest prevalence of polypharmacy was seen in the 60-69 years age group. 76 (76%) prescriptions were inappropriate according to Beers, START/STOPP criteria.

Conclusion: Inappropriateness of prescription was observed in the study population. Highest prevalence of polypharmacy was seen in age group 60-69 years. Polypharmacy was significantly observed in patients without any co-morbidities. A focused and systematic way of prescribing is needed to improve for the better quality of life of the patient.

Key words: Polypharmacy, appropriateness of prescription, Beers criteria, START/STOPP criteria, geriatric.

I. INTRODUCTION

According to WHO polypharmacy is defined as "the administration of many drugs at the same time or the administration of an excessive number of drugs" (WHO, 2004), commonly considered to be the use of 5 or more drugs.

In older people the most challenging health issues are drug related. Other than drug related, the age related changes and pathologies in older people are a secondary cause and they are more vulnerable to morbidity and mortality, The term polypharmacy originally coined to check issues like multiple drug consumption and excess use of drugs.^[1] Due to increased number of comorbidities polypharmacy is inevitable in elderly population. However polypharmacy does have its disadvantages which include increase in non-adherence, side effects, interactions and irrational use of medications. The association between polypharmacy and its disadvantages has been proven in many studies^{[2][3]}

Potentially inappropriate medication (PIMs) consists of those medications whose risk outweighs their benefits. These medications can be identified by using various screening tools like Beers criteria, START/STOPP criteria. These criteria are used to improve the rational and safe use of medication. Thus they prevent overprescribing of medications and subsequently side effects caused by it in the elderly population. Inclusion of medications in these criterias are mostly based on the possibility of side effects occurring in specific susceptible age groups like geriatric patients.^{[4][5]}

II. MATERIALS AND METHODS

A prospective observational study was carried out on 100 patients (>60 years) with respiratory associated illness admitted to the general medicine department in a tertiary care teaching hospital. The study was conducted for a duration of 6 months and was approved by the Institutional Ethical Committee of NIMS University. A total of 100 patients were enrolled in the study after obtaining informed consent and by considering the inclusion and exclusion criteria. Data collected included the socio-demographic details, assessment of the patient and treatment plan prescribed. Data obtained as analysed using SPSS version 22.0.

III. Results

Table no 1. Distribution of polypharmacy with respect to gender in the study population

Groups	Polypharmacy	
	Present	Absent
Male	61	12
Female	25	2
Total population	86	14

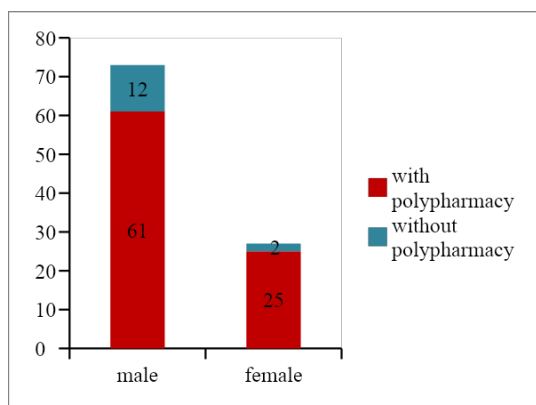


Figure 1

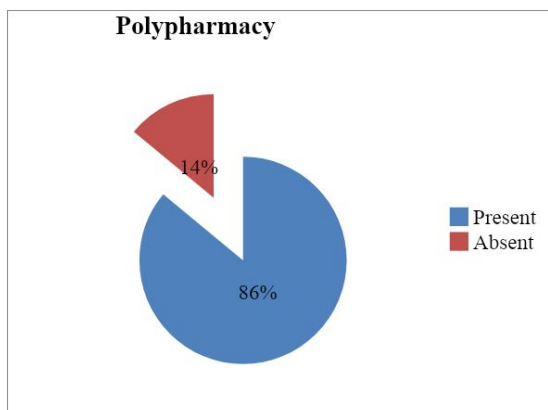


Figure 2

The table no. 1 shows the distribution of polypharmacy with respect to gender in the study population. Out of 100 patients polypharmacy was present in 86% of the population.

Table no. 2. Distribution of polypharmacy with respect to age among study population

Age distribution	Total number of Patients	Number of patients with polypharmacy
60-69	81	68 (83%)
70-79	16	15 (93%)
80-89	02	02(100%)
≥90	01	01 (100%)

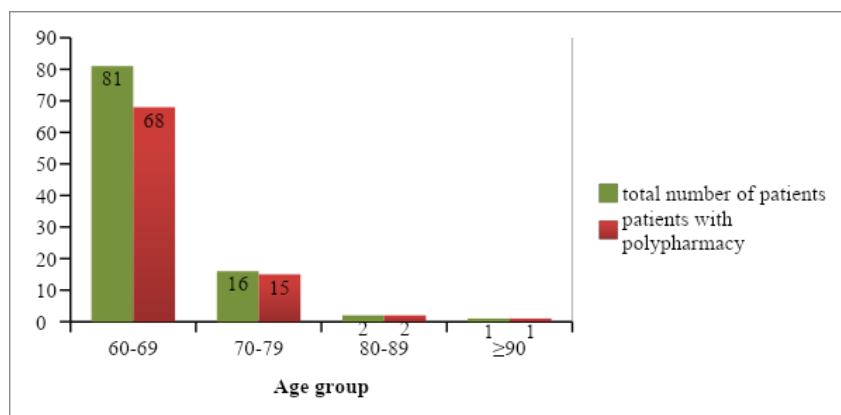


Figure 3

As shown in the figure and table above the proportion of polypharmacy is higher in the age group 60-69 that is 68. While the least number of polypharmacy were found to be in the age group of above 90 that is 1.

Table no. 3. Association between comorbidities and number of drugs prescribed in the study population

Number of comorbidities	Average number of drugs prescribed (mean ± SD)
0	9.56±3.93
1	11.81±3.70
2	12.09±4.30
3	22.0

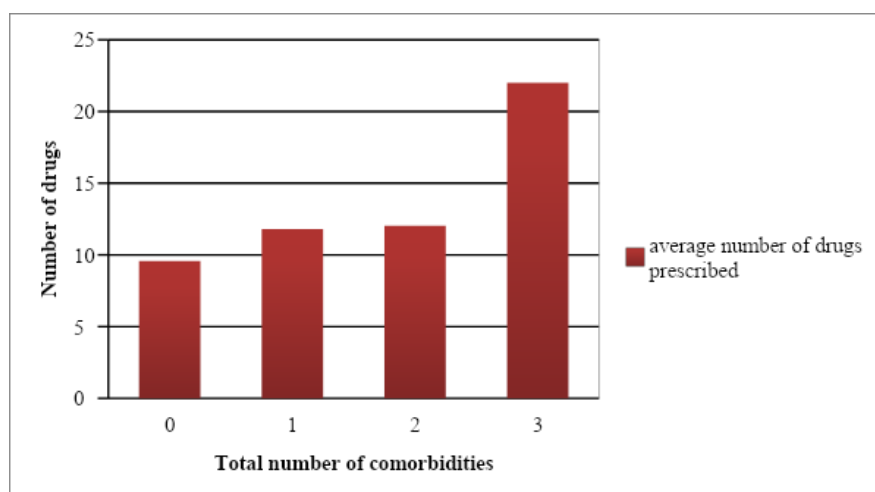


Figure 4

The above table and figure shows the association between comorbidities and number of drugs prescribed. The average numbers of drugs prescribed were 9.5 for patients who did not suffer from any comorbidity. The p value was found to be 0.001. The highest number of drugs prescribed was 22 in patients suffering from 3 comorbidities. There was a positive correlation between increasing comorbidity and polypharmacy ($r = 0.323$).

Table no. 4. Age group-wise distribution of elderly patients based on the number of comorbidities (n=100)

Number of comorbidities	Total number (%) n=100	Age category, n(%)			
		60-69 years (n=81)	70-79 years (n=16)	80-89 years (n=2)	≥90 years (n=1)

0	72(72%)	60	9	2	1
1	16(16%)	10	6	0	0
2	11(11%)	10	1	0	0
3	1(1%)	1	0	0	0

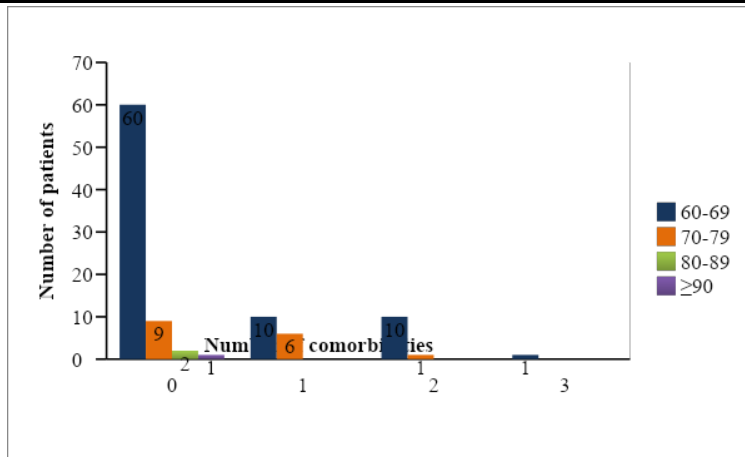
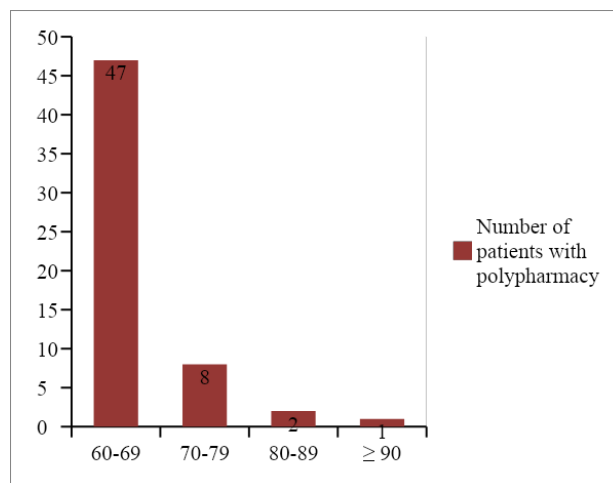


Figure 5

The above table and figure represents age group-wise distribution of elderly patients based on the number of comorbidities. The number of patients in the age group 60-69 who did not have any comorbidity was 60. The patients suffering from one comorbidities and two comorbidities were 10 each. 1 patient suffered from three comorbidities in this age group. Similarly, 9 patients in the age group 70-79 years did not suffer from any comorbidity. The patients suffering from one comorbidities were 6 and patients suffering from two comorbidities were 1.

Table no. 5. Distribution of polypharmacy in patients without comorbidities

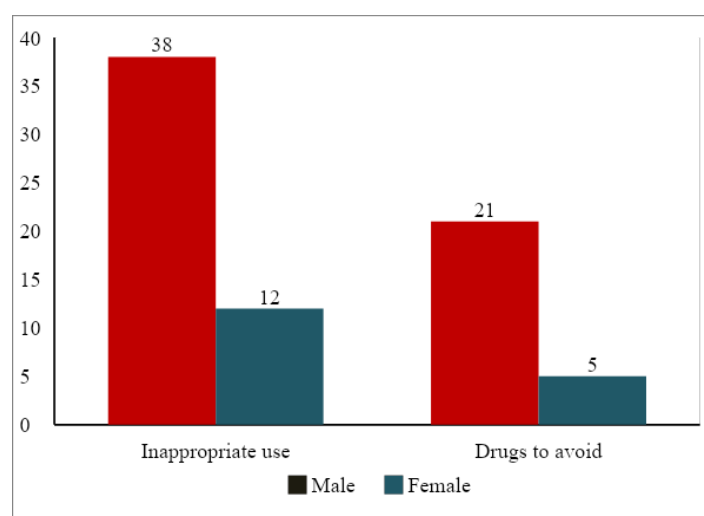
Age group	Number of patients with Polypharmacy (n=100)
60-69	47 (58%)
70-79	8 (50%)
80-89	2 (100%)
≥90	1 (100%)



The above table and figure shows Polypharmacy was found in 58% patients in the age group of 60-69 years despite having no comorbidity while 50% of the patients in the age group 70-79 years were found to have polypharmacy without any comorbidities. 100% patients in the age groups 80-89 years and above 90 years were exposed to polypharmacy without any comorbidity.

Table no. 6. Proportion of patients receiving inappropriate prescriptions in the study population

Groups	Inappropriate use	Drugs to avoid
All patients n (%)	50	26
Males, n (%)	38	21
Females, n (%)	12	5



The above table and figure represents the proportion of patients receiving inappropriate prescriptions. Inappropriate uses of medications were found in 50 patients of which 76% were male and 24% were female. Total number of 26 patients had drugs to avoid according to beer's criteria in their prescription. Of these 80% were male and 20% were female.

IV. DISCUSSION

Polypharmacy is one of the major problems in geriatric patients. Because of age related problems and comorbidities they have to take a large number of medications. Polypharmacy increases the risk of numerous negative health consequences in the elderly.

In this study we evaluated the proportion of geriatric patients with respiratory associated diseases receiving polypharmacy in a tertiary care hospital. In this study the age of the selected patients were ≥ 60 years. A total of 100 patients were included in the study among them, 73 (73%) were males and 27 (27%) were females. Mean age of the patient was 67.21 ± 5.53 years (60-92 years). Around 14 (14%) patients were receiving <5 medications and 86 (86%) patients were on five or more than five medications. Mean number of medications used by patients was 10.33 ± 4.19 (range 1-23). A study done by K.B. Rakesh, et al^[6] the prevalence of polypharmacy was 66.2% and there was no difference in the proportion of polypharmacy in both genders. In our study the prescription with highest number of drugs had 23 while similar study had 10 drugs prescribed.^[6]

In this study the proportion of polypharmacy is higher in the age group 60-69 years that is 68 while the least number of polypharmacy were found to be in the age group of above 90 that is 1. In the age group 60-69

years 47 patients were exposed to polypharmacy without any comorbidity. This shows that most patients were exposed to polypharmacy as a result of medication prescribed for symptomatic treatment.

One of the important reasons for polypharmacy in geriatrics is comorbidities. In this study 28% of the patients were suffering from comorbidities like DM, HTN, CKD, Liver diseases and others. In this study 16% (n=16) of the patients having one comorbid condition and 11% (n=11) of patients with two comorbid conditions and 1% (n=1) of patients with three comorbid conditions. A study done by Raut A et al,^[7]. A large number of patients (33.33%, n = 40) had two comorbid conditions; on the other hand, some patients (25% n = 30) had one comorbid condition. A few number of patients had five or more comorbid conditions.

Focusing on avoiding inappropriate drug use will allow clinicians and other health professionals to reduce side effects and other complications. By using Beers, START/STOPP criteria we can avoid inappropriateness of drug use and promote appropriateness of prescriptions in geriatric patients. These criteria are used to alert physicians and help to reduce inappropriate prescribing^[5].

In this study 50% of the patients were receiving inappropriate medication according to STOPP criteria. Of these 38 (76%) of them are males and 12 (24%) of them are females. Compared to females the inappropriate use of medication was seen more in males. Under use of medications was assessed by START criteria and there was no indication of drug prescription omissions according to START criteria. MuhtesemErolYayla, et al,^[8] in this study the number of patients that took part was 325 (average age: 73.23±6.44 years). Among these participants, 48 patients (14.8%) were using drugs inappropriately according to STOPP criteria. Similar to our study there was no potential prescribing omissions in MuhtesemErolYayla, et al,^[8] study. For assessment of inappropriateness in the patients both overused drugs and drugs to be avoided were considered and it was found that 76 patients (76%) received inappropriate medication. A study done by Chowta et al,^[9] the inappropriate use of medication was seen in 39 patients out of 120 patients (32.5%).

The Beers Criteria are intended to improve medication selection, reduce adverse drug events, and provide a tool to assess cost, patterns, and quality of care of drugs used for people aged 65 years or older. In this study as per Beers criteria out of 100 patients 26 (26%) were prescribed the drugs which are to be avoided. Of these 21 (80%) patients were males and 5 (20%) patients were females. Our study found that most of the patients were exposed to inappropriate medication similar to the study done by BollaNithin et al,^[10].

V. CONCLUSION

Inappropriate prescription was observed in geriatric patients. The prevalence of polypharmacy was high in the study population. Polypharmacy was mostly seen in the patients due to medications prescribed for symptomatic treatment. In addition, a significant amount of inappropriateness was observed in the study. This can be prevented by following the criteria established and providing empirical treatment to the patients. Most of the criteria have been developed in western countries and the adverse events observed may not be similar in India. These factors should be considered while assessing the appropriateness of prescription in geriatric patients. A focused and systematic way of prescribing is needed to improve for the better quality of life of the patient.

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