Janaki Medical College Journal of Medical Sciences (2021); Vol.9 (2):27-33

JMCJMS

Original Article

Polypharmacy among Geriatric People: Community Pharmacy based study in Bhaktapur district, Nepal

Shrijana Kumari Chaudhary[1]

Department of Pharmacology
Kathmandu Medical College Teaching Hospital
Duwakot, Bhaktapur, Nepal

[1]Lecturer, Department of Pharmacology, Kathmandu Medical College Teaching Hospital, Duwakot, Bhaktapur, Nepal

ABSTRACT

Background and Objectives: Polypharmacy among geriatric group is a major problem. Risk of an adverse effect increases exponentially with number of drugs used, partly because multiple drug therapy reflects the presence of many disease. The aim of this study was to assess the polypharmacy among geriatric people visiting community pharmacy of Bhaktapur district.

Material and Methods: A prospective cross sectional study was conducted among 114 geriatric people (>60Years). The data collected from patients included: Socio-demographic details as age, gender, comorbid diseases, medication history. In this study, polypharmacy was considered as having ≥ 5 medications per prescription. Medication appropriateness for patient was analyzed by applying, screening tool to alert to right treatment (START) and screening tool of older person's prescription (STOPP) criteria.

Results: Out of 114 geriatric patients 57.9% were male and 42.1% were female. Number of drugs prescribed to the patients were 634 with an average of 5.56 drugs per person. Cardiovascular drugs accounted for most (33.4%) followed by gastrointestinal tract drugs (11.5%), anti-diabetic drugs (10.89%). Over the counter drugs (OTC) were more common among geriatric, mainly proton pump inhibitor and non-steroid anti-inflammatory drugs. Depending upon the number of drugs, five and more than five drugs were consumed by single patients (n=73). Poly pharmacy can be seen among 64.03% geriatric patients. Potentially inappropriate medications were prescribed to 54 patients, overprescribing to38.5% and omission to 8.7% depending upon screening tool to alert to right treatment (START) and screening tool of older person's prescription (STOPP) START.

Conclusions: In this study polypharmacy was more common among geriatric group. Geriatric group were receiving around 64.03% polypharmacy, 47.3% inappropriate prescription and 33.3% using over the counter drugs.

Key word: Geriatric, over the counter (OTC), Polypharmacy, STOPP and START criteria

INTRODUCTION

World Health Organization (WHO) defined old as a person, above 60 years of age [1]. In Nepal the older population of the country is increasing and It is accounted that 2.1 million elderly inhabitant constitutes 8.1 percent of the total population in the country [2].

Ageing is a progressive generalized impairment of function resulting in the loss of adaptive responses to stress and growing risk of age-associated disease [3]. In elderly, renal

function progressively declines, also there is a reduction in the hepatic microsomal drug metabolizing activity and liver blood flow as compare to adult [4]. They don't have the characteristic symptoms and sign of a disorder and many common conditions may manifest without the typical or classic features [5].Older people are prone to develop cumulative toxicity while receiving prolonged medication so due to this the incidence of adverse drug reactions are much higher in them as there is lower renal as well as metabolic clearance [4].

Polypharmacy can be defined as the concurrent use of five or more than five different medications by a patient for the treatment of a particular disease or group of diseases [5]. Polypharmacy is more common among older people because they use more drugs than other age group and have many chronic disorders that affect drug response so providing safe effective drug therapy is one of the greatest challenges among them [6]. New geriatric potentially inappropriate prescribing (IP) criteria have been revised and validated, called screening tool of older persons' prescriptions (STOPP) and screening tool to alert to right treatment (START) for detection of potential errors of prescribing commission and omission [7].

A community pharmacy is a combination of service and business, where pharmaceuticals are sold and information is provided about the use of medicines and the prevention and treatment of disease [8]. In community pharmacy, the pharmacist could play a significant role in the self-management of minor illness by using over – the - counter medicines [9]. Over the counter drugs are defined as safe and effective for use by the general public without a doctor's prescription [10]. Over-the-counter (OTC) medication is commonly used among older. The most common OTC medications utilized worldwide are Non-steroidal anti-inflammatory drugs (NSAID), stomach upset, antitussive, allergy and skin rashes and itching medications [11].

In elderly adverse drug reactions can cause functional deterioration, changes in mental status, failure to thrive, depression, confusion or loss of appetite [6].

Polypharmacy increases the potential for drug-drug interactions and for prescription of potentially inappropriate medications. Medication review is an essential part among geriatric patients to avoid adverse effects that can be caused due to polypharmacy and drug related adverse effects. This study was conducted to assess the polypharmacy among older population in Bhaktapur district.

MATERIALS AND METHODS

A cross-sectional study among 114 geriatric patients (>60yrs age) was conducted in the community based pharmacy of Bhaktapur district (Suryabinayak) for duration of 3months (Dec.2020-March2021). Before starting the study ethical committee clearance was obtained from Institutional Review Committee Kathmandu Medical College. Socio-demographic characteristics and medical information such as age, sex, comorbidity, drug (dose, frequency, and route) were recorded from geriatric group. In addition, geriatric were specifically asked about the use of OTC and herbal drugs. The structural interview was done at the pharmacy. Community pharmacists were interviewed by using a structured questionnaire to assess the appropriateness of the drug. The collected data were analysed using the Statistical Package for Social Sciences (SPSS) for Windows version 17.0. Descriptive statistics were used to summarize data. Medication appropriateness for each patient was analysed by, Screening tool of

older people's potentially inappropriate prescription (STOPP) criteria, and screening tool to alert doctors to right treatment (START) criteria. Elderly patients (>60 years) are included in study. Patients excluded in this study are: age of patients less than 60 years, uncooperative, unable to give response (major hearing loss, disoriented, not able to speak properly).

RESULTS

A total of 114 geriatric patients were included in the study. Out of the total subjects 57.9% were males and 42.1% were females. The mean age of the subject was 69.24 ± 7.3 years and age range was 61 to 90 years. The most common comorbidities were HTN (62.3%), DM (46%), acute peptic disease (APD) (14.03%), chronic obstructive pulmonary disease (COPD) (5.3%), benign prostate hypertrophy (BPH) (5.3%), others (33.3%) and 6.14% had no any associated comorbid condition. Among the study population 42.9%, 43.9%, 13.0% and 0.88% were having single, double, triple and more than triple comorbid conditions respectively. The patients were taking a minimum of 1 and a maximum of 11 medications.

Among 114 patients, total number of drugs prescribed was 634 and average number of drugs per prescription was 5.56. Cardiovascular drugs were most commonly used (33.4%), followed by GIT drugs (11.5%), antidiabetic drugs (10.8%), antimicrobial drugs (6.15%). The five most commonly used drugs/drug classes were oral hypoglycemic drug (10.8%), Calcium channel blockers (CCB) (10.09%), proton pump inhibitors (9.6%), angiotensin receptor blockers (ARBs) (9.1%) and antimicrobial (6.15%).

Table 1 Sociodemographic details of geriatric patients

Titles	Number N=114	Percentage (%)
Age		
61yrs-75yrs	19	13.29%
76-85yrs	66	46.15%
>85	58	40.56 %
Gender		
Male	66	57.9%
Female	48	42.1%
Comorbidities		
Single (1)	49	42.9%
Double (2)	50	43.9%
Triple (3)	15	13.0%
>3	1	0.88%
None	7	6.1%
HTN	71	62.3%
DM	46	40.3%
APD	16	14.03%
COPD	6	5.3%
BPH	6	5.3%
Others	38	33.3%

Table 2: Distribution of drugs among geriatric patients in different categories according to Anatomic Therapeutic Chemical classification

Drugs Class	Drug code (based on ATC classification)	Number of prescribed drugs	Percentage (%)
Cardiovascular drugs		212	**33.43%**
CCB	C08CA	64	
Diuretic	C03CA	2	
B-Blocker	C07AB	4	
ARBS	C09CA	58	
Miscellaneous		84	
GIT Drugs		**73**	**11.51%**
PPI	A02BC	61	
Miscellaneous		12	
Antidiabetic Drug		**69**	**10.89%**
OHA	A10B	69	
Antimicrobial	J01	**39**	**6.15%**
Miscellaneous		238	37.53%
Herbal		**3**	0.47%

Table 3: The number and percentage of inappropriate drug according to STOPP criteria and potentially prescribing omission according to START criteria

Criterion	Description	N (%)
STOPP	Calcium channel blockers with chronic constipation	6 (5.2%)
	Duplicate drug class prescription(two concurrent NSAID)	29 (25.3%)
	PPI maximum therapeutic dosage for >-8weeks	5 (4.3%)
	Anticholinergic, antispasmodic with chronic constipation	2 (1.75%)
	Loperamide for treatment of diarrhea of unknown cause	1 (0.8%)
	Aspirin >150mg per day(increase bleeding risk)	1 (0.8%)
	Total	**44 (38.5%)**
START	Calcium and vitamin D supplement with known osteoporosis	9(7.8.%)
	Regular inhaled corticosteroids for moderate severe asthma or COPD where predicted FEV1<50%	1(0.8%)
	Total	**10 (8.7%)**

Polypharmacy

Total number of drugs prescribed was 634 and an average5.6 drugs per prescription was observed. Among 51 (44.7%) patients 5 to 7 drugs per prescription were found followed by 8 to 9 drugs per prescription in 21 (18.4%) patients (Figure 1).

The geriatric medications were assessed according to the STOPP and START criteria. Out of 114 prescriptions 44 were overprescribed as per STOPP criteria and 10 patients were under prescribed as per START criteria. The details are presented in table 3.

Over –the- counter medications

Among geriatric patients, 33.3%were using over the counter drugs and most common drugs were nonsteroidal anti-inflammatory group drugs followed by proton pump inhibitor (26.3%).The most common NSAID group drugs were paracetamol and ibuprofen.

DISCUSSION

Among 114 geriatric patients the average number of prescribed medications per patient was 5.56 which was similar to the studies conducted by Oliveria MPV et al [12] (5.69) and Sharma N et al [13] (5.51) .The studies done by Mishra A K et al [14] (9.3) reported slightly higher values for the average number of medication received by the geriatric patient. The variation in average number of drugs may be due to number of patients and associated comorbidities. The most common comorbidity among geriatric

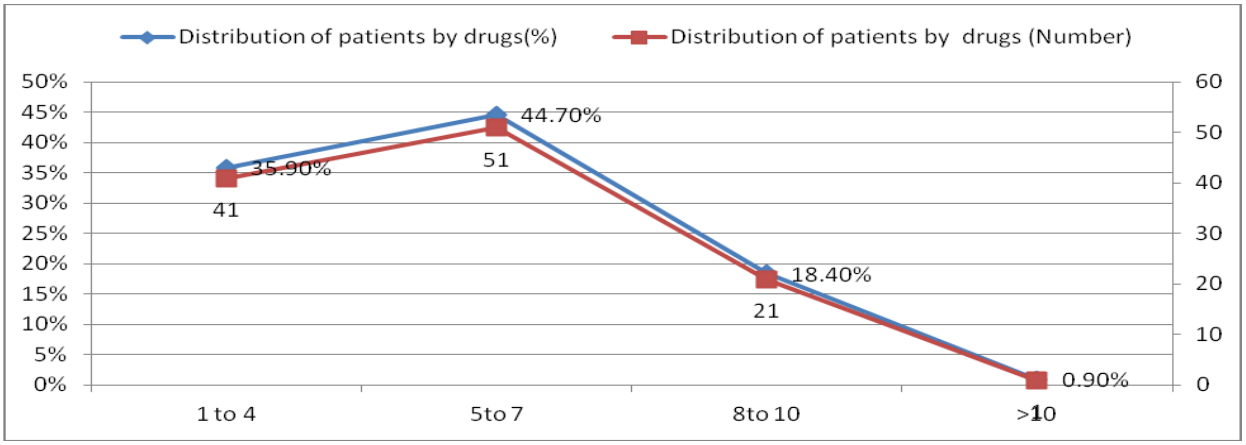

Figure 1: Distribution of geriatric patients by number of drugs administered

was hypertension (62.3%) followed by acute peptic disease and diabetes mellitus. Similarly, hypertension was the most frequent diagnosis found on the study done by Gupta R et al [15]. Sharma N et al [13] and Assefa YA et al [16]. Depending upon the number of comorbidities, 43.9% geriatric patients had two comorbidities. Ageing is a progressive generalized impairment of function resulting in the loss of adaptive responses to stress and growing risk of age-associated disease [3].

Among geriatric patients 64.03% were receiving five or more medications. Similar finding was observed in the studies conducted by Rakesh KB et al [17] (66.2%) and Ahmed B et al [18] (68.2%). Comparing polypharmacy with respect to gender, it was found to be more in male individuals (60.8%) compared to females (39.2%). Depending upon the age, polypharmacy was more common in between the age of 61 to 87 years (44.70%). With age the body undergoes several changes that can affect the pharmacokinetic (absorption, distribution, metabolism, and excretion of drugs). These changes included a reduction in renal clearance, liver size, and lean body mass [19]. The most clinically important of these changes is the reduction in renal clearance, which results in reduced excretion of water soluble drugs [20]. Polypharmacy is the administration of many drugs (five or more drugs) which is more common among geriatric people who have more chronic diseases and have to use multiple drugs [21]. Polypharmacy has also been documented as a major risk factor for adverse drug effects [22].

Out of total prescribed drugs (634) most commonly prescribed drugs were cardiovascular drugs (33.3%), gastrointestinal drugs (11.5%) and diabetic drugs (10.8%). Considering individual drugs, the most commonly prescribed drugs were oral hypoglycemic drugs (10.8%), calcium channel blockers (10%), Angiotensin receptor blockers (9.1%), and Proton-pump inhibitor (9.6%). Drugs acting on cardiovascular system were the most commonly used drugs in study conducted by Sharma N et al [13]. Hypertension (62.3%) was more common among geriatric group as well as important risk factor for cardiovascular morbidity and mortality. Ageing is an inevitable part of life and brings along two inconvenient events: physiologic decline and disease state [23].

The prevalence of the usage of over the counter (OTC) drugs among geriatric group was 51%[13].In this study 43.8% of geriatric group were using OTC drugs and the most commonly used were NSAID (3.15%) and proton pump inhibitor (4.73%).The usage of OTC drugs was associated with higher socioeconomic status and literacy [24].

In this study the total inappropriate prescribing were 54 (44 STOPP and 10 START).Depending upon the number of inappropriate prescription, 8prescription had two inappropriate drug one prescription had 3 inappropriate drugs. Over prescribing (38.5%) was assessed by using STOPP and omission (8.7%) was assessed by START criteria. The potential prescribing omissions (PPO) were lesser as compared to study conducted by Rakesh KB et al [17] (13.1%). The variation among prevalence of inappropriate prescriptions may be due to differences in patient characteristics, drug prescribing pattern and assessment [24].

CONCLUSION

The polypharmacy among geriatric group was 64.03%.and the highest in the age

between 61 to 87 years. Inappropriate prescription was observed in the geriatric patients. Older people often have several coexisting medical problems and take multiple drugs. Polypharmacy is associated with increases in many adverse outcomes. A number of patients receive drugs which are to be avoided as per STOPP criteria, and under prescribed as per START criteria. Good prescribing practice can reduce inappropriate prescribing among geriatric people. Pharmacists, who practice in community-based settings are key to improving adherence to prescribed medications. The regular medication reviews, with patients taking four or more drugs per day.

ACKNOWLEDGEMENTS

I would like to express my special thanks to the pharmacists who helped me during my study period in their pharmacies as well as elderly who accepted to participate in the study. Secondly I would like to thank Dr. Naresh Manandhar for his valuable guidance and support.

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Correspondence to:
Dr. Shrijana Kumari Chaudhary
Department of Pharmacology
Kathmandu Medical College
Duwakot, Bhaktapur, Nepal
Email: scshrisan@gmail.com