PRESCRIPTION PATTERN AND POLYPHARMACY AMONG ELDERLY PATIENTS: HOME MEDICATION REVIEW

Dr. Pranabesh Sikdar[1], Dr. G. Saisriharsha[2*] , [3]Dr.SaravanaKumar Kasimedu

[1] Associate Professor, Royal School of Pharmacy, The Assam Royal Global University, Guwahati
[2] Research Scholar, Royal School of Pharmacy, The Assam Royal Global University, Guwahati
[3] Professor, Seven Hills College of Pharmacy(Autonomous), Tirupati, Andhra Pradesh.
*Address for correspondence: Dr. G. Sai Sri Harsha, Research Scholar, Royal School of Pharmacy, The Assam Royal Global University, Guwahati,

Abstract

The growing size of the elderly population in developing world including India is undoubtedly posing mounting pressures on various socio-economic fronts including increased inter-personal and health related problems, health care expenses etc. Moreover, this considerable population faces multiple physiological, medical and psychological problems with aging that are different than that of other stages; chronic diseases are common, the rate of drug related problems, drug interactions and inappropriate medication use is much disturbing and at times severe. So, there is an emerging need to pay greater attention to age-related issues. The aim of this study was to assess the polypharmacy among elderly patients. A cross-sectional study was conducted on 207 elderly patients of ≥ 60 years old with concomitant use of 4 or more medications, defined as Polypharmacy. The results found that the percent prevalence of polypharmacy among the study population was 32.3%. The generated data of this study can be used to implement various programs on awareness and prevention regarding Polypharmacy to reduce the adverse effects and misery to the elderly. Further, this can be utilized by programmers, policymakers, researchers, academicians and social workers who are working in the field of health of geriatrics. **Keywords:** Geriatrics, Elderly, Aging, Polypharmacy, Concomitant usage, Prescribing patterns

Introduction

India considered as an 'ageing population' has the second highest population of elderly in the world, projected to rise to 12% of the total population by 2025 with 80% of elderly living in rural areas, 40% below the poverty line, over 73% illiterate, about 90% of them having no official social security and 73% of deaths accounting to heart diseases, smoking and cancers. [1] In the modern era, increasing use of inappropriate and multiple medication among elderly is emerging as a major public health concern as it leads to many complexities during old age with the detrimental effect (even death at times) on the health of elderly and the quality of life of the elderly. [2] There are few studies on the predictors of polypharmacy among elderly in India. Thus, there is reasonable need to undertake this study. [3] With this study, we will be able to assess the level of polypharmacy that is prevalent among the elderly population.[4] The generated data of this study can then be utilized in various programmes to take adequate measures to reduce its adverse effects and misery to the elderly.[5] More emphasis should be laid down for the proper use of medication and to improve the comfort level among elderly patients and the health providers to talk and communicate freely about their health issues. [6] Findings of the study will be helpful for the policymakers, researchers, academician and social workers who are working in the field of health.[7] The main aim of this study is to assess the polypharmacy among the elderly patients and to determine association between socio-demographic factors with polypharmacy.

Methodology

Study Design- A cross-sectional descriptive design was adopted to carry out the study.

Study population- The study population constituted of patients above 60 years of age

Sample size- $n = NZ^2 p (1-p) d^2 (N-1) + Z^2 p (1-p)$ Since the population of the area was finite(less than 50,000) n = Sample size Z = Standards normal variable with 95% confidence interval

Sampling technique- Proportionate sampling technique was used. Sampling was done based on by home medication review.

Population of the study / sample-

Inclusion criteria

• Elderly aged above 60 year who were willing to participate in the study.

• Elderly present at the time of study.

Exclusion criteria

• Elderly suffering from cancers and other traumatic disorders.

• IPD patients.

• Mentally disturbed patients.

Data Collection Tool- Data was collected using structured survey questionnaire by the researcher.

Validity and Reliability-Validation and reliability were done with the reference of research papers. The questionnaire was prepared in an easy way for the better understanding of the respondents. Expert opinion was taken whenever needed.

Study Period- The study period allotted for the completion of thesis. Data analysis software SPSS version 23 was used for data entry, processing and analysis.

Ethical consideration- The research was conducted after taking approval from the Institutional Review Committee (IRC). Verbal and written consent were taken from participants. Privacy of the information was maintained and used for research objective only.

Following descriptive and inferential statistics were performed for data analyses- • Frequencies and percentages of different variables to check the prevalence of polypharmacy. • Chi-square test to examine significant statistics of polypharmacy with socio-demographic variables.

Results

Characteristics of the elderly patients:

Table- 1: Socio-demographic characteristics of the geriatrics

Variable	Non-Polypharmacy *n*=143 (%)	Polypharmacy *n*=61 (%)	Excessive Polypharmacy *n*=3 (%)	Total *n*=207 (%)
Age in years				
60-64	45 (31.5)	15 (24.6)	1 (33.3)	61 (29.5)
65-69	57 (39.9)	29 (47.5)	1 (33.3)	87 (42)
70-74	24 (16.8)	11 (18)	1 (33.3)	36 (17.4)
75-79	10 (7)	5 (8.2)	-	15 (7.2)
>80	7 (4.9)	1 (1.6)	-	8 (3.9)
Gender				
Male	74 (51.7)	29 (47.5)	3 (100)	106 (51.2)
Female	69 (48.3)	32 (52.5)	-	101 (48.8)
Marital status				
Widowed/Married	58 (40.6)	21 (34.4)	2 (66.7)	81 (39.1)
Unmarried	85 (59.4)	40 (65.6)	1 (33.3)	126 (60.9)
Occupation				

Variable	Non-Polypharmacy *n*=143 (%)	Polypharmacy *n*=61 (%)	Excessive Polypharmacy *n*=3 (%)	Total *n*=207 (%)
Unemployed/Housewife	65 (45.5)	35 (57.4)	3 (100)	101 (48.8)
Employed	78 (54.5)	26 (42.6)	0	106 (51.2)
Socioeconomic Status				
Lower Middle Class	36 (25.2)	19 (31.1)	1 (66.7)	56 (27.1)
Middle Class	100 (69.9)	40 (65.6)	2 (33.3)	142 (68.6)
Upper Middle Class	6 (4.2)	2 (3.3)	0	8 (3.9)
High Class	1 (0.7)	0	0	1 (0.5)
Educational Status				
Illiterate	64 (44.6)	29 (47.5)	3 (100)	95 (45.9)
Primary Education	54 (37.5)	27 (44.3)		82 (39.6)
Higher Education	25 (17.5)	5 (8.2)		30 (14.5)
Co-morbid conditions				
Present	101 (70.5)	51 (84.4)	3 (100)	155 (75)
Absent	42 (29.5)	10 (16.6)	0	52 (25)

Table 2: Characteristics of the elderly patients

Variable	Non-Polypharmacy *n*=143 (%)	Polypharmacy *n*=61 (%)	Excessive Polypharmacy *n*=3 (%)	Total *n*=207 (%)
Self-Reported Health				
Good	22 (15.4)	5 (8.2)	0	27 (13)
Moderate	106 (74.1)	48 (78.7)	3 (100)	157 (75.8)
Poor	15 (10.5)	8 (13.1)	0	23 (11.1)
Usage of Medicines				
Regular	69 (48.3)	45 (73.8)	2 (66.7)	116 (56)
Irregular	74 (51.7)	16 (26.2)	1 (33.3)	91 (44)
Health Status				
Any longstanding illness or chronic conditions	13 (9.1)	11 (18)	1 (33.3)	25 (12.1)
Handicap	0	0	0	0
Depression in past one year	8 (5.6)	3 (4.9)	0	11 (5.3)
Contact with health services in past one month	58 (40.6)	31 (50.8)	2 (66.7)	91 (44)

Variable	Non-Polypharmacy *n*=143 (%)	Polypharmacy *n*=61 (%)	Excessive Polypharmacy *n*=3 (%)	Total *n*=207 (%)
Hospitalization in past one year	14 (9.8)	4 (6.6)	0	18 (8.7)
Undergone any surgery in past one year	4 (2.8)	1 (1.6)	0	5 (2.4)
Nil	46 (32.2)	11 (18)	0	57 (27.5)
Alternative system of Medicine Followed				
Ayurvedic	5 (3.5)	6 (9.8)	0	11 (5.3)
Homeopathic	5 (3.5)	1 (1.6)	0	6 (2.9)
Siddha	4 (2.8)	1 (1.6)	0	5 (2.4)
Unani	0	0	0	0
Nil	129 (90.2)	53 (87)	3 (100)	185 (89.4)

Co-morbid medical conditions prevalent in the geriatric patients

Table 3: Co-morbid medical conditions prevalent in the geriatric patients

Co-morbid medical conditions	Number of patients (percentage of patients who suffered from particular disease)
Diabetes mellitus	55 (35.6)
Hypertension	47 (30.4)
Heart disease	21 (13.5)
Musculoskeletal disorders	42 (27.1)
Osteoarthritis	47 (30.4)
Respiratory diseases	17 (11.1)
CNS disorders	13 (8.5)

Prescription pattern of the study population

Table 4: Prescription pattern in the study population using World Health Organization core drug prescribing indicators

Core prescribing indicators	Values
Average number of drugs prescribed per encounter	4
Percentage of drugs prescribed by generic name	709 (85.5)

Core prescribing indicators	Values
Percentage of encounters with an injection prescribed	47 (22.7)
Percentage of encounters with an antibiotic prescribed	19 (9.2)
Percentage of drugs prescribed from National list of essential medicine	726 (87.6)
Percentage of drugs prescribed as fixed dose combinations	20 (9.7)

Table 5: Drugs utilization pattern according to WHO-ATC classification in the geriatric population

Category of Drugs	Drug Name	Number of Drugs (%) (*n*=829)	Dosage Form	ATC Code
Drugs acting on gastrointestinal system	Ranitidine	158 (19)	Oral	A02BA02
	Metoclopramide	15 (1.8)	Oral	A03FA01
	Ondansetron	12 (1.4)	Oral, parenteral	A04AA01
	Loperamide	5 (0.6)	Oral	A07DA03
	Oral rehydration salts	5 (0.6)	Oral	A07CA
	Antacid	5 (0.6)	Oral	A02AD01
Vitamins, minerals	Multivitamins	73 (8.8)	Oral	A11AA03
	Calcium	67 (8.1)	Oral	A02AC01
	Ferrous sulphate	23 (2.8)	Oral	B03AA07
	Vitamin B 12	18 (2.2)	Parenteral	B03BA01
Drugs acting on cardiovascular system	Enalapril	66 (8)	Oral	C09AA02
	Aspirin	29 (3.5)	Oral	B01AC06
	Clopidogrel	26 (3.1)	Oral	B01AC04
	Amlodipine	18 (2.2)	Oral	C08CA01
	Isosorbide dinitrate	10 (1.2)	Oral	C01DA08
	Spironolactone	6 (0.7)	Oral	C03DA01
Drugs acting on endocrine system	Metformin	50 (6)	Oral	A10BA02
	Glibenclamide	30 (3.6)	Oral	A10BB01
	Insulin	7 (0.8)	Parenteral	A10AB02
	Betamethasone	4 (0.5)	Topical	D07XC01
Analgesic, anti- inflammatory, antipyretic drugs	Diclofenac	50 (6)	Oral, topical, parenteral	M01AB05
	Paracetamol	16 (1.9)	Oral	N02BE01
	Ibuprofen	10 (1.2)	Oral	M01AE01

Category of Drugs	Drug Name	Number of Drugs (%) (*n*=829)	Dosage Form	ATC Code
Hypolipidemic drugs	Atorvastatin	49 (5.9)	Oral	C10AA05
Drugs acting on respiratory system	Salbutamol	11 (1.3)	Oral	R03CC02
	Theophylline	3 (0.4)	Oral	R03DA04
	Cough suppressant	10 (1.2)	Oral	R05FB01
Antimicrobial drugs	Amoxycillin	7 (0.8)	Oral	J01CA04
	Metronidazole	5 (0.6)	Oral	A01AB17
	Ciprofloxacin	4 (0.5)	Oral	J01MA02
	Gentamicin	3 (0.4)	Topical	J01GB03
	Norfloxacin	3 (0.4)	Oral	J01MA06
Drugs acting on nervous system	Phenytoin	7 (0.8)	Oral	N03AB02
	Valproate	5 (0.6)	Oral	N03AG01

Discussion

A total of 296 elderly patients who attended the home medication review to participate in this study and at the end of 2 months, a total of 207 prescriptions from consented patients were analyzed (response rate: 70%).

On analysis about 29.5% (61) were on polypharmacy and only 1.5% (3) patients were on excessive polypharmacy. Out of the 207 patients, 51.2% (106) were males and 48.8% (101) were females. Most of the patients, 42% (87) were in the age group of 65-69 years. One or more comorbid conditions were present in all of the patients (100%) on excessive polypharmacy and in about 84.4% of the patients on polypharmacy. [8] [Table 1].

In this study about 18.7% of the elderly patients with polypharmacy and excessive polypharmacy reported about irregular intake of medicines. An overall of 44% patients had visited health care facility in the past one month. None of the patients on excessive polypharmacy revealed to be on any complementary system of medicines [Table 2]. [9]

Statistically significant differences were not obtained between the three subgroups of patients namely non- polypharmacy, polypharmacy and excessive polypharmacy, based on their sociodemographic and health related characteristics.

Co-morbid medical conditions prevalent in the geriatric patients[10]

The average number of co-morbidities was 1.6 with the most common comorbid medical condition being diabetes mellitus in about 35.6% (55), followed by hypertension and osteoarthritis in 30.4% (47) of patients respectively [Table 3].

Prescription pattern of the study population[11-12]

The average number of drugs per encounter was 4 and about 85.5% (709) of drugs were prescribed by the generic name. Percentage of encounters with an antibiotic injection prescribed were 9.2% and 22.7% respectively. A total of 87.6% (726) drugs were prescribed from National List of Essential Medicine [Table 4& 5].

Conclusion

The present study concluded that polypharmacy is an emerging public health concern among elderly in India. This study highlights the growing prevalence of polypharmacy among elderly patients. While intervention strategies showed a statistically significant reduction in polypharmacy cases, careful monitoring remains essential to prevent adverse outcomes. Future research should explore deprescribing strategies and patient education to further minimize risks. Since the only focus of the study was the use of polypharmacy & its associated factors, thus more research needs to be done to have insight into the geriatric health and the consequences of polypharmacy.

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