

A Prospective Observational Study on Polypharmacy in Geriatrics at a Tertiary Care Hospital, Erode

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ABSTRACT

Objectives: The aim of this research is to investigate the prevalence, different factors and consequences associated with polypharmacy in geriatrics.

Methods: It was a prospective observational study. The study was conducted in in-patient department of a tertiary care hospital, Erode. A total of 350 patients with age group of 65 years and above were randomly selected. Each prescription of the patients were assessed and checked for any consequences of polypharmacy. Polypharmacy were recorded and also patient interview was taken to assess drug related problems due to poly pharmacy. The information recorded included the demographic details of the patients, comorbid illnesses, details about medications being, the total number of drugs being used, and the factors associated with polypharmacy.

Results: A total of 350 patients were recruited for this study, out of this 230 were males (65.71%) and 120 were females (34.28%). Among the 350 patients, 330 patients were on polypharmacy (94.2%). Among 330 patients, 143 patients had their hospital stay ≤ 1 week (43.33%), 117 patients with ≤ 2 week (35.45%), 51 patients with ≤ 3 week (15.45%) and 19 patients with ≥ 3 weeks (5.75%). Majority of the study population had at least one drug related problems.

Conclusion: The prevalence of polypharmacy is very high among geriatric population in the study site. The study supported the consequences of polypharmacy and was closely associated with multiple comorbidity and advanced age. A close and intensive monitoring

of geriatrics in regard with polypharmacy could restrain the consequences. Clinical pharmacist could play crucial role in handling this crisis efficiently, by performing regular medication chart reviews, providing information and patient counselling regarding drug safety and polypharmacy.

Keywords: polypharmacy, prevalence, geriatrics, drug related problem, comorbidity

INTRODUCTION

In the modern era, with the increase in the lifespan of individuals due to increased access to health-care facilities, the population of elderly is also increasing with an equal pace.¹ However, on the other hand, with the increasing population of the elderly, the issue of polypharmacy has also emerged. The term polypharmacy is defined as the use of multiple medications by a patient, but generally, it ranges from 5 to 10.² The use of multiple medications by a patient leads to many problems such as the drug interactions among different drugs taken together, increase in adverse drug reactions, decrease in the compliance of patients taking so many medications together, unnecessary drug expense, and all these factors putting together lead to poor quality of life of patients.³ Polypharmacy is an important issue in elderly people who tend to have more disease conditions for which therapies are prescribed as compared younger individuals.⁴

Older people are more vulnerable to morbidity and mortality secondary to drug-related harms because of age-related changes and pathologies; comorbidity of chronic conditions, such as cardiovascular diseases and psychological disorders; and different pharmacokinetics and pharmacodynamics.⁵ Consequently, older adults are more susceptible to adverse drug reactions (ADR).⁶ As aforementioned, multimorbidity is one of the major problems that arise as populations age. In addition to issues in taking their medication themselves, multimorbid senior patients are more vulnerable to prescription problems.⁷ Even in the best case scenarios, using good clinical practice and accepted guidelines for prescribing medication, the physician is obliged to use multiple guidelines for the treatment of various conditions within the same patient.⁸ On the other hand, available guidelines are usually devised with focus on a single disease, and overlook the possibility of comorbidities and the consumption of other medications by the patient.⁹ This is a condition described as problematic or inappropriate polypharmacy, as opposed to appropriate polypharmacy, where the use of a combination of medicines has been optimised.^{10,11} Self-medication is a potential cause of polypharmacy and the availability of diverse over-the-counter drugs, especially potentially inappropriate medications for older people, exacerbate this problem.^{12,13} Other issues related to drug use include low literacy in general or low health literacy in particular.¹⁴ Additional contributing factors include miscommunication or misunderstanding physician orders as a result of cognitive dysfunction, and mistaking drugs because of similarity in shape or colour, both of which can arise more often in older age groups.^{15,16}

Although the concept of 'polypharmacy' is used interchangeably to describe multiple, excessive, unnecessary, or unindicated drug consumption, each type of polypharmacy has specific consequences on both the patient and the health system.¹⁷ Each definition of polypharmacy implies

that the patient has been exposed to a different risk, and is therefore subject to a variety of different consequences, including higher costs, higher prevalence of ADR, reduced compliance and adherence, lower quality of life, higher risk of hospitalisation and even death.^{18,19}

MATERIALS AND METHODS

A prospective observational study was conducted in a tertiary care hospital, Erode, Tamil Nadu for a six month period from March 2019 to September 2019. Ethical approval was obtained from the institutional review board and a written informed consent was taken from all the participants. A validated questionnaire was used in this study to assess the polypharmacy and its consequences. We assessed the prevalence of polypharmacy by checking each prescription of patients. After that we interviewed the patients to assess any polypharmacy related consequences. Also we assessed the duration of hospital stay of patients.

RESULTS & DISCUSSION

Table 1. Demographic details

Characteristics	Frequency	Percentage (%)
Sex		
Male	230	65.71
Female	120	32.26
Age(Years)		
65-70	228	65.1
71-76	82	23.4
77-82	18	5.14
83-88	13	3.71
89-94	9	2.57
Social Status		
Alcoholic	169	48.28
Smokers	84	24
Alcoholic & Smokers	58	16.57
Teetotalers	39	11.14
Comorbidities		
DM	109	31.14
Hypertension	92	26.28
Dyslipidemia	52	14.85
CVD	57	16.28
LRTI	21	6
Others	19	5.42

Table 2. Prevalence of poly pharmacy

Sl. No	Number of drugs in a prescription	Frequency (n=330)	Percentage (%)
1	<5	17	5.1
2.	5-10	221	63.1
3.	11-15	79	22.57
4.	>15	13	3.71

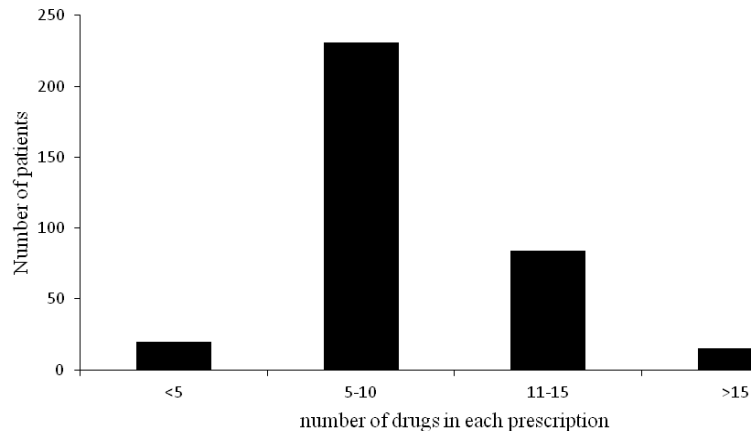


Figure 2. Prevalence of polypharmacy

Table 3. Distribution of hospital stay of patients

Sl.No	Duration of hospital stay	Frequency (n=330)	Percentage (%)
1.	<1 week	143	43.33
2.	<2 week	117	35.45
3.	<3 week	51	15.45
4.	>3 week	19	5.75

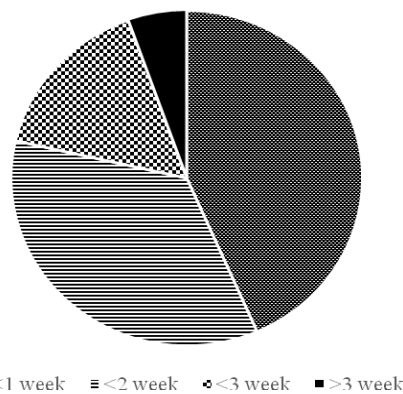


Figure 3. Distribution of hospital stay of patients

Table 4. Distribution of polypharmacy related consequences

Sl.No	Polypharmacy related problems	Frequency (n=330)	Percentage (%)
1.	Adverse drug reactions (ADR)	24	7.27
2.	Drug - drug interactions (DDIs)	30	9.09
3.	Potentially Inappropriate Medications (PIMs)	90	27.27
4.	Drug related problems (DRPs)	186	56.36

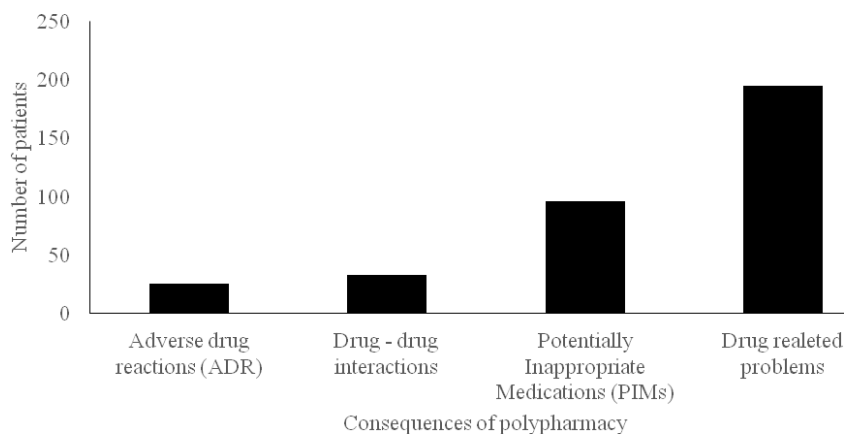


Figure 4. Distribution of polypharmacy related consequences

The study was conducted to find out the prevalence of polypharmacy among elderly patients and also to assess the consequences of polypharmacy in geriatric population. A total of 350 patients were recruited for this study, out of this 230 were males (65.71%) and 120 were females (34.28%) (Table 1).

Similarly, Viswam KS et al., conducted a prospective observational study on polypharmacy in geriatric population. Their study population consists 130 (61%) males and 82 (39%) were females.

Among 350 patients, 228 belongs to the age group of 65-70 years (65.1%), 82 belongs to 71-76 years (23.4%), 18 belongs to 77-82 years (5.14%), 13 belongs to 83-88 years (3.71%) and 9 belongs to 89-94 years (2.57%). The result indicated that majority of the patients were in the age group of 65-69 years (Table 1). Among the 350 patients, 330 patients were on polypharmacy (94.2%) (Table 2).

Similarly, Cia KT et al., conducted a study on prevalence of polypharmacy in elderly patients. They concluded that multiple comorbidity results in reduced life expectancy which might be the reason for more number of patients in the age group of 65-69 years. Moreover average Indian life expectancy is in between 65-70 years.

Out of 350 patients, 169 patients were alcoholics (48.28%), 84 were smokers (24%), 58 were both alcoholic and smoker (16.57%) and 39 were teetotalers (11.11%) (Table 1).

The present study discloses majority of the patients were alcoholics which is contradictory to a similar study conducted by Viswam KS et al., stating that teetotalers were common among their study population.

Among 350 patients, 109 patients had diabetes mellitus (31.14%), 92 patients had hypertension (26.28%), 57 patients had CVD (16.28%), 52 patients had dyslipidaemia (14.85%), 21 patients had LRTI and 19 patients had others comorbid conditions (Table 1).

In the present study, the most common comorbid conditions were diabetes (31.14%), hypertension (26.28%) and 57 (16.28%) were suffering from Cardio Vascular Disease (CVD). Similarly, Gale et al., on International Diabetic Foundation (IDF) concluded that India have maximum number of diabetes patients than any other country. A statistical significant association was observed between comorbidities and polypharmacy. Also, Park et al., concluded in his study that as the age progresses, the chances of multiple comorbidity is common which in turn reflects the prevalence of polypharmacy among geriatrics.

The number of drugs prescribed for the study population was calculated. The result revealed that total of 2245 drugs was prescribed. The average number of drugs prescribed in the study population was found to be with a minimum of 5 drugs to the maximum of 14 drugs. 94.2% of the study population was found to be under polypharmacy (Table 2). A similar result observed in a study conducted by John et al., also reported polypharmacy prevalence to be very high among their study population.

Among 330 patients, 143 patients had their hospital stay ≤ 1 week (43.33%), 117 patients with ≤ 2 week (35.45%), 51 patients with ≤ 3 week (15.45%) and 19 patients with ≥ 3 weeks (5.75%) (Table 3). This result was alike to a study conducted by Nagaraju PJ et al., that shows the majority of the population were discharged within a week.

Out of 330 patients, 24 patients developed an ADR (adverse drug reaction) (7.27%). During the study period, 30 (9.09%) of the study population were found to be prescribed with PIMs (potentially inappropriate medications) listed in Beers criteria. 90 patients had drug interaction (27.27%) and 186 patients had drug related problem (DRP) (56.36%). Majority of the study population had at least one drug related problems (Table 4).

Similarly, Subessh et al., concluded in his study that risk of ADRs among

geriatrics is higher as they are on polypharmacy and necessitates to be vigilant on drug therapy safety. Drug response in geriatrics might be unpredictable as the physiological functions are altered. Alike, a study by Viktil et al., shows that DRPs are related to the drugs being used during hospital stay; addition of each drug increases the risk of DRPs which has occurred in over whole range of drugs. It was found that 27(13%) of the study population were free from DRPs while majority of the study population had at least one drug related problems.

Limitations

The study was conducted in a short time period and collected sample size was less.

CONCLUSION

The prevalence of polypharmacy is very high among geriatric population in the study site. The study supported the consequences of polypharmacy and was closely associated with multiple comorbidity and advanced age. A close and intensive monitoring of geriatrics in regard with polypharmacy could restrain the consequences. Clinical pharmacist could play crucial role in handling this crisis efficiently, by performing regular medication chart reviews, providing information and patient counselling regarding drug safety and polypharmacy. Also the hospital stay and financial burden increased due to polypharmacy along with health related consequences. A multidisciplinary approach by involving physician, nurses and clinical pharmacist to work as a team is the best way of dealing with the challenges.

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