

PREVALENCE AND RISK REDUCTION OF POLYPHARMACY: OVER THE AGE OF 25 YEARS

Yellamraju Venkata Hari Shankar*¹, Bandaru Madhu Harsha¹, Bandi Ravi Teja Reddy¹, Kathi Vara Prasad¹, Nallani Venkata Rama Rao² and Nadendla Ramarao³

¹Department of Pharmacy Practice, Chalapathi Institute of Pharmaceutical Sciences, Lam, Guntur, Ap.

²Associate Professor, Department of Pharmacy Practice, Chalapathi Institute of Pharmaceutical Sciences, Lam, Guntur, Ap.

³Principal, Chalapathi Institute of Pharmaceutical Sciences, Lam, Guntur, Ap.

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***Corresponding Author**
Yellamraju Venkata Hari
Shankar

Department of Pharmacy
Practice, Chalapathi
Institute of Pharmaceutical
Sciences, Lam, Guntur,
AP.

ABSTRACT

The concurrent use of multiple medications by a patient to treat usually coexisting conditions and which may result in adverse drug interactions is called as **Polypharmacy**. The term “polypharmacy” was originally coined to refer to certain issues related to multiple drug consumption and excessive drug use. It is arguably one of the most pressing prescribing issues as the percentage of the population described as elderly is growing, and a higher prevalence of multiple, chronic disease states must be managed concurrently. Among older adults, polypharmacy is a common problem. Currently, 44% of men and 57% of women older than age 65 take five or more medications per week; about 12% of both men and women take 10 or more medications per week. These agents include both prescription and

over-the-counter (OTC) preparations. The more medicines a patient takes, the higher their risk of adverse events, including serious ones, from these combinations, rather than from the underlying illnesses. Healthcare providers must evaluate and balance a drug’s potential adverse effects against its potential benefits to identify the appropriate approach for an older patient. Advances in information technology, such as electronic prescribing, electronic medical records, and electronic laboratory records, are innovative ways to decrease the risk of adverse drug reactions and interactions. The aim of the present study is to implement clinical pharmacy services to the patients under polypharmacy. We also aim to provide information

about the disease, drugs, & DRPs. Unforeseen risks could be minimised if they are identified in time.

KEYWORDS: Polypharmacy, Over the Counter Drugs, Electronic Medical Records, Drug Related Problems.

INTRODUCTION

The use of multiple drugs, often termed polypharmacy is commonly defined as using from 5 to 10 prescription drugs.^[1] This polypharmacy is sometimes necessary, but may be associated with an increased risk of adverse outcomes.^[2] Although the term polypharmacy has evolved over time and is often used to mean many different things in different situations, its basic definition is quite simple, more drugs are prescribed or taken than are clinically appropriate.^[1,2] A recent survey indicated that 25% of the overall population takes five or more medications per week.^[3] When specifically considering the population 65 years of age and older, this percentage increases to about 50%, with 44% of men and 57% of women taking five or more medications per week and 12% of both sexes taking 10 or more prescriptions per week.^[4] The most worrisome consequence of polypharmacy is the occurrence of adverse drug reactions (ADRs), but increased drug costs and patient quality of life are also significant issues.^[5] The elderly population, which often suffers from multiple chronic diseases requiring multiple medications, continues to increase.^[6] These patients are much more likely to experience Polypharmacy and its negative consequences, especially ADRs.^[7] ADRs affect approximately 10-20% of hospitalized patients and around 7% of the general population; this number increases when the population of interest is limited to the elderly.^[8]

Drug interactions refer to modification of response to one drug by another when they are administered simultaneously or in quick succession. Although, the severity of these interactions in most of the cases is unpredictable.^[9]

Inappropriate medications can be defined, in terms of older people, as “medications or medication classes that should generally be avoided in persons 65 years or older because they are either ineffective or they pose unnecessarily high risk for older persons and a safer alternative is available”.^[10]

Over the last 20-30 years, problems related to ageing, multimorbidity and polypharmacy have become a prominent issue in global healthcare. The consequences of polypharmacy and drug interactions in elderly patients have already been documented by many researchers particularly in western countries.^[11]

Polypharmacy and associated **adverse drug reactions** are becoming very common now a days. It is well established that older adults are more likely to be affected by multiple chronic conditions, thus increasing the likelihood that they take several or more medications concurrently.^[12] Elderly patients often use multiple medications together, including prescription, nonprescription, and herbal or dietary supplements. In India there are no standard guidelines about the use of drugs. The geriatric patients with a multiple diseases had consumed more drugs and have higher chance of polypharmacy and inappropriate drug usage.^[13]

Polypharmacy increases the risk of **drug-related events** such as falls, confusion and functional decline. In one of the studies, it was found that elderly commonly used both prescribed and non-prescribed medicine together which get them into the risk of major drug-drug reaction.^[14]

National Health and Nutrition Examination Survey (NHANES III) reveals that nearly 74% of the elderly populations in India use prescribed medications. Half of them aged 65-74 use 2 or more prescribed drug and 12% use 5 or more prescribed drug.^[15]

Appropriate prescribing is the outcome of the decision-making process that maximizes net individual health gains within the society's available resources. If a drug has benefits that outweigh the risks, then the use of drug is considered appropriate.^[16]

Evaluation of quality of health care, especially in geriatrics, is gaining more importance in the recent years. Elderly patients are the largest consumers of medication. Nearly, 7.7% of the Indian population are geriatrics (60 years old).^[17] Longer life expectancy, comorbidity, and the strict adherence to evidence-based clinical practice guidelines pave the way for polypharmacy. **Prescribing cascade**, i.e., medication resulting in an adverse drug reaction (ADR) that is treated with another medication could be one of the factors involved in polypharmacy.^[18]

AIM AND OBJECTIVES

AIM: To study the Impact of Clinical pharmacy services in Polypharmacy Patients.

OBJECTIVES

1. To study the rationale of the prescription
2. To identify drug related problems and decrease complications
3. To educate the patient about the disease, drugs and the importance of medication adherence.

DESIGN OF STUDY: Cross sectional, house hold study.

MATERIALS AND METHODS: A structured questionnaire was used to know about the basic data regarding awareness, knowledge, traditional beliefs, treatment practices and other issues of the condition. The prescriptions of poly pharmacy patients will be examined.

INCLUSION CRITERIA

- People who come under category of polypharmacy are selected
- Adults > 25 years and < 75 years were included in the study
- Both the genders were included in the study

EXCLUSION CRITERIA

- Age < 25 years and >75 years were excluded
- Pregnant and lactating mothers were excluded

STUDY METHOD

The study was conducted in the community settings (rural areas around the Guntur) by taking the samples randomly. Patients were selected based on inclusion and exclusion criteria.

Patient were observed for their medication taking behavior, ADR's, response to treatment and counseled accordingly and the data will be tabulated and analyzed using suitable statistical tools.

RESULTS

A total of 1186 people were screened. Among them 395 subjects were included and explained about the study, 45 of them refused to participate in the study. Out of 350 study

participants 268 were found to be non-adherent with their treatment and 82 strictly follows the therapeutic recommendations provided by their physicians.

Table 1: Patient characteristics.

Parameter	No of subjects (N=350) n	Percentage (%)
Age:		
25-35	29	8.28%
36-45	54	15%
46-55	66	18.80%
56-65	98	28%
>66	103	29.42%
Gender		
Male	212	60.57%
Female	138	39.42%
Education		
Illiterate	99	28.28%
Primary	136	38.85%
Secondary	74	21.14%
Graduate	41	11.71%
Income level/month		
<10,000	185	52.85%
10,000-20,000	118	33.71%
>20,000	47	13.42%

DISTRIBUTION OF DISEASES

Out of 350 patients, 75 patients are suffering from Diabetes and Hypertension and 48 patients are suffering from Diabetes, Hypertension and CVA and 46 patients are suffering from Varicose veins and obesity and 38 are presented with DVT and Thyroid and 37 are presented with Diabetes and Osteoarthritis and 36 are suffering from Diabetes and Hypertension and CAD whereas, 26 patients are with liver disorders and 23 are with Renal impairment and 16 are with respiratory disorders. 3 patients are suffering from HIV & TB and only 2 are suffering from Acute Psychosis.

DISTRIBUTION OF DISEASES

DISEASE	FREQUENCY	PERCENTAGE
DM & HTN	75	21.42%
DM & HTN & CVA	48	13.71
DM & HTN & CAD	36	10.28
DVT & THYROID	38	10.85
DM & OA	37	10.57
LIVER DISORDERS	26	7.42
RENAL IMPAIRMENT & HTN	23	6.57
VARICOSE VEINS & OBESE	46	13.14

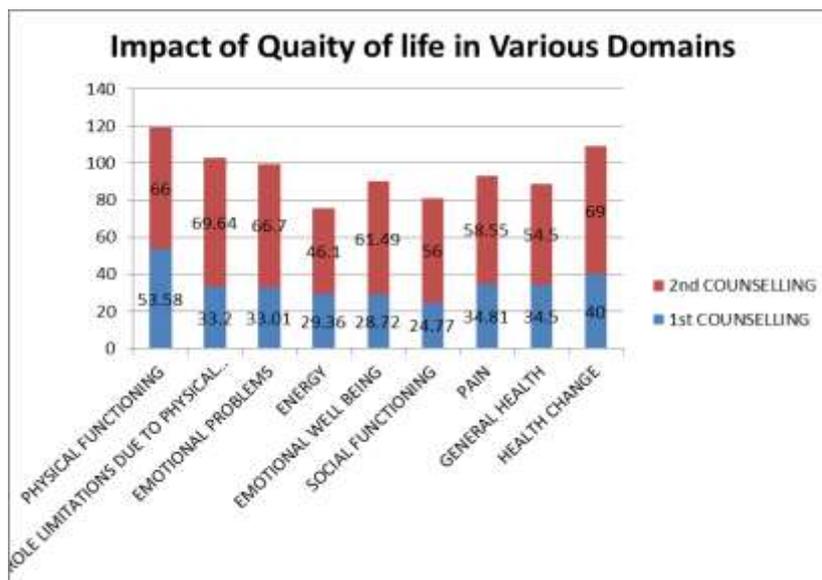
RESPIRATORY PROBLEMS & ANEMIA	16	4.57
HIV & TB	03	0.85
HTN & ACUTE PSYCOSIS	02	0.57
TOTAL	350	100

COMPARISON OF MEAN SCORES OF QOL BETWEEN VISITS

DOMAINS	BASELINE	VISIT 1	P-VALUE
Physical functioning	53.58 +23.2	66.00+24.10	< 0.0001 ***
Role limitations due to physical health	33.62+32.06	69.64+30.19	< 0.0001 ***
Emotional problems	33.01+33.30	66.70+33.45	< 0.0001 ***
Energy	29.36+10.88	46.10+13.53	< 0.0001 ***
Emotional well			
Being	28.72+16.70	61.49+13.29	< 0.0001 ***
Social functioning	24.77+17.70	56.00+22.55	< 0.0001 ***
Pain	34.81+30.83	58.55+26.06	< 0.0001 ***
General health	34.50+12.15	54.50+13.70	< 0.0001 ***
Health change	40.00+12.26	69.00+12.74.	< 0.0001 ***

P-value of < 0.0001*** represents highly significant.

The mean scores of various domains in the SF36 questionnaire were compared among the both follow-ups and p values were determined. The p value of <0.0001 was found to be highly significant. The mean scores were considerably increased from the follow up to the second.



Among the given data, there was a considerable growth in all the domains after counselling. A huge increase was found in the role limitations domain from 33.2% to 69.64%. And also the Social Well being was increased enormously. The mean data of Pain and Health change

domains were also increased considerably. Overall, the QOL of the patient has got a good change after Patient Counselling.

DISCUSSION

Out of 350 Patients enrolled, Majority of the subjects were within the age group of 65 and above age, and were males, employed, had primary education, income level per month was <10,000, family details were 3-5 in no and majority subjects care givers were spouses.. The adherence among the patients was improved as evident from the questionnaire. 263 people were interested in getting counselling. Most of the Patients suffered from DM & HTN. The number of DRP (Drug related problems) was also decreased from the 1st follow up to the 2nd follow up. (Influence of Patient Counselling in The Decrease of Drug-Drug Interactions). Quality of life of patients were also improved after patient counseling as measured using the WHO QOL, patients condition improved by each visit. P-value was calculated by using unpaired t-test and the results are found to be statistically highly significant ($p < 0.0001^{***}$) (figure: Impact of Quality of Life In Various Domains). This study was in concordance with study done by Dixon Thomas (2009) on “**Effect of Patient Counseling on Quality of Life of Hemodialysis Patients in India**” which concluded that patient counseling is an effective way to improve health- related QOL and awareness. The number of Drug Interactions were also decreased considerably with the 2nd followup.

CONCLUSION

The current survey shows that the majority of rural population had a poor knowledge about the self medication and the proper usage of drugs. Firstly the clinical pharmacists should educate about the dangers of indiscriminate use of OTC drugs. Secondly, the physician should be more judicious in prescribing, and must insist the chemist on appropriate dispensing of drugs which should be done only on a valid prescription. Thirdly, a proper statutory drug control must be strictly implemented. These, three measures would definitely reduce the incidence of drug-related mishaps and help in maintaining good health of the Individual's and the society. Finally by the medication history interview and medication chart review, clinical pharmacist can reduce the errors and can improve the medication appropriateness. So, clinical pharmacy services within a multi-professional healthcare team improve the quality and safety of patients' drug therapy.

BIBLIOGRAPHY

1. Zarowitz BJ, Stebelsky LA, Muma BK, Romain TM, Peterson EL. Reduction of high-risk polypharmacy drug combinations in patients in a managed care setting. *Pharmacotherapy*, 2005; 25: 636–45.
2. Goh CR. Minimising Polypharmacy - a challenge in palliative care. *Singapore Med J.*, 2002; 43: 273–5.
3. Nisly NL, Gryzlak BM, Zimmerman MB, Wallace RB. Dietary Supplement Polypharmacy: An Unrecognized Public Health Problem? *Evid Based Complement Alternat Med.*, 2010; 7: 107–13.
4. Kaufman DW, Kelly JP, Rosenberg L, Anderson TE, Mitchell AA. Recent patterns of medication use in the ambulatory adult population of the United States. The Slone Survey. *JAMA*, 2002; 287: 337–44.
5. Nolan L, O'Malley K. Prescribing for the elderly: Part 1. Sensitivity of the elderly to adverse drug reactions. *J Am Geriatr Soc.*, 1998; 36: 142–9.
6. Lamy PP. adverse drug effects. *Clin Geriatr Med.*, 1990; 6: 293–307.
7. Montamat SC, Cusack B. Overcoming problems with polypharmacy and drug misuse in the elderly. *Clin Geriatr Med.*, 1992; 8: 143–58.
8. Williams P, Rush DR. Geriatric polypharmacy. *Hosp Pract*, 1986; 21: 9–20.
9. Roenke KL, Pinholt EM. Reducing polypharmacy in the elderly. *J Am Geriatr Soc.*, 1990; 38: 31–6
10. Kroenke KL. Polypharmacy. *Am J Med.*, 1985; 79: 149–52.
11. Stewart RB, Cooper JW. Polypharmacy in the aged. Practical solutions. *Drugs Aging*, 1994; 4: 449–61
12. Gurwitz JH, Field TS, Harrold LR, Rothschild J, Debellis K, Seger AC, et al. Incidence and preventability of adverse drug events among older persons in the ambulatory setting. *JAMA*, 2003; 289: 1107–16.
13. Gomez ER, Demoly P. Epidemiology of hypersensitivity drug reactions. *Curr Opin Allergy Clin Immunol*, 2005; 5: 309–16.
14. Chumney EC, Robinson LC. The effects of pharmacist interventions on patients with polypharmacy. *Pharm Pract*, 2006; 4: 103–9.
15. Aminzadeh F, Dalziel WB. Older adults in the emergency department: A systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. *Ann Emerg Med.*, 2002; 39: 238–47.

16. Carlson JE. Perils of polypharmacy: 10 steps to prudent prescribing. *Geriatrics*, 1996; 51: 26–35.
17. Hanlon JT. Drug-related problems update. *Am J Geriatr Pharmacother*, 2004; 2: 88-90.
18. Steinman MA, Rosenthal GE, Landefeld CS, Bertenthal D, Sen S, Kaboli PJ. Conflicts and concordance between measures of medication prescribing quality. *Med Care*, 2007; 45: 95–9.