Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

ORIGINAL RESEARCH

An observational study to find out rationality of polypharmacy in geriatric medicine OPD in tertiary care hospital

[1]Dr. Anand Pandey, [2]Dr. DK Katiyar, [3]Dr. Amod Kumar, [4]Dr. Kausar Usman

[2]Associate Professor, [1,3]Department of Pharmacology, King George's Medical University, Lucknow, U.P, India
[4]Department of Medicine, King George's Medical University, Lucknow, U.P, India

Correspondence:
Dr. Anand Pandey
Department of Pharmacology, King George's Medical University, Lucknow, U.P, India

Received: 27 September, 2022 Accepted: 22 October, 2022

Abstract

Aim: An observational study to find out rationality of polypharmacy in geriatric medicine OPD in tertiary care hospital.

Material and methods: Patient with age of 65 years and above fulfilling the inclusion criteria was enrolled after written informed consent. 171 patients were included in this study. Prescription of patient enrolled was be noted down in a paper to be retain for further analyses in case record form. These increases was categories into various category required for application of beer's and STOPP/START criteria. Every visit was be utilized for detail prescription (change if any) and find ADR. Patient was be given telephone number to primary investigator observe reported ADR since beginning further detailed information regarding any ADR was be taken out to be analysed by using Naranjo Scale and Hartwig's Severity scale.

Results: The frequency distribution of age intervals of the study subjects. 88.9% patients were in the age range of 65-75 years, 10.5% in 76-85 years and 0.6% in the age range of more than 85 years. Mean age was 69.15±4.82 years with median of 67 years. It is observed that 737% were make and 26.3% were females. Polypharmacy present includes subjects as 63% not definitely inappropriate and 37% potentially inappropriate. Polypharmacy present includes subjects as 73.7% START, 26.3% STOPP. 79.3% were possible and 20.97% were probable. [83.9 %] were Level - 1 and [16.1%] were level -3. Total 62 ADR were reported in which 22 patients were taking potential inappropriate medication, but this association is insignificant. In polypharmacy present, 61.3% were present and 63.6% were absent. The association was not significant and p value in 0.812.

Conclusion: We concluded that the AGS Beers Criteria in clinical practise in the geriatric population should inspire the prescribers. Strict measures should be adopted to implement medical reconciliation practises in centres caring for older patients with numerous comorbidities because the problem of polypharmacy and potentially inappropriate treatment is rising in developing countries.

Keywords: Polypharmacy, Geriatric**,** Naranjo Scale, Hartwig's Severity,ADR

Introduction

Polypharmacy, defined by the World Health Organization as "the administration of many drugs at the same time or the administration of an excessive number of drugs, is an increasingly common public health problem". While there is not a single, widely accepted

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

definition of how many medications make up polypharmacy, some researchers have suggested that it's either 4 or 5 medications. In the US, 5 prescription medications are used by 15% of all adults. In geriatric populations and primary care-based cohorts, polypharmacy is linked to poor health outcomes, such as prescription non-adherence, adverse pharmacological effects, and lower quality of life Nearing the end of life, patients must take an increasing number of medications to manage non-life-threatening comorbidities, treat life-limiting illnesses and their symptoms, and avoid age-related disorders.[1]

To treat their chronic diseases, older adults frequently take many medications, which frequently leads to polypharmacy (the concurrent use of 5–9 medicines) and hyper polypharmacy (the concurrent use of 10 medicines). There haven't been much research done to determine how common polypharmacy, hyper polypharmacy, and the use of potentially inappropriate medications (PIMs) are among elderly individuals in developing nations. In this study, geographical differences in the prevalence of polypharmacy, hyper-polypharmacy, and PIM use among elderly Indians (60 years and older) were looked at.(2) There were 703 million people aged 65° years or over in the world in 2019. The number of the older people is projected to double to 1.5 billion by 2050, with a more prominent increase in developing countries.[2]

India is currently experiencing a demographic change. According to the 1991 census, there were 57 million senior people in India, up from 20 million in 1951. The number of elderly people increased significantly between 1991 and 2001, and it has been predicted that by the year 2050, there will be about 324 million elderly individuals worldwide. As a result of 7.7% of its population being over 60, India has earned the reputation of being "an ageing nation." Because of the accessibility of better health care facilities, the demographic transition is attributed to the declining fertility and mortality rates. Population over 60 years of age, 10% suffer from impaired physical mobility and In India, the elderly people suffer from dual medical problems, i.e., both communicable as well as non-communicable diseases. This is further compounded by impairment of special sensory functions like vision and hearing. A decline in immunity as well as age- related physiologic changes leads to an increased burden of communicable diseases in the elderly. The prevalence of tuberculosis is higher among the elderly than younger individuals. Due to their multimorbidity, geriatric patients in long-term care (LTC) facilities have a wide range of (non-specific) symptoms and geriatric syndromes. It is important to distinguish between adverse drug reactions (ADR) brought on by pharmacological therapy and symptoms attributable to a disease. The latter can result in hospital admissions, have a significant influence on morbidity and mortality, and have high health care costs throughout the acquisition phase. Because there may be a variable temporal link between an AE and the delivery of the medicine in that situation, continuous and on-demand drugs were evaluated independently.[3]

Globally, around 50% of people suffer from Diabetes mellitus. Additionally, they already have hypertension, putting them at a higher risk of contracting both macrovascular and microvascular illnesses. This ultimately leads to coronary artery disorders, congestive heart failure, and cardiac cell death. To combat these difficulties, diabetics are more prone to take several medications. Additionally, as the patient ages, he or she develops other chronic diseases and utilises multiple medications as a result.[4]

Geriatricians are trained in assessments of multimorbidity and polypharmacy. A closer cooperation between geriatricians and family physicians (FPs), who have a key role in the follow-up of patients over time, might thus be beneficial. We investigated whether clinical geriatric assessments and collaborative medication reviews conducted by a geriatrician in cooperation with the patient’s FP could have positive effects on HRQoL and other patient-relevant outcomes in homed welling older patients receiving polypharmacy.[5]

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

Geriatricians have received training in multimorbidity and polypharmacy assessments. Thus, increased collaboration between geriatricians and family physicians (FPs), who play a crucial part in the long-term follow- up of patients, may be advantageous. We investigated whether the HRQoL and other patient-relevant outcomes of home-bound, healthy older patients receiving polypharmacy may be improved by clinical geriatric assessments and collaborative medication reviews performed by a geriatrician in collaboration with the patient's FP.[6]

To date, the Beers criteria have been used to the identification of PIMs (possibly inappropriate pharmaceuticals) in the elderly population PIM reduction is linked to better overall health of older patients and has a positive influence in reducing falls.(13) However, additional criteria have been created and verified for the identification of inappropriate medications for older persons because the Beers list of criteria has some major issues and questions have been raised about its application in geriatric pharmacotherapy. STOPP (screening tool of prescriptions of older persons) and START are the names of these new criteria (screening tool to alert to right treatment).[7]

Material and methods

This study was be conducted in department of pharmacology in collaboration of department of medicine utilizing services of geriatric OPD at KGMU. Patient with age of 65 years and above fulfilling the inclusion criteria was enrolled after written informed consent. The sample size was calculated based on a study done where the prevalence of inappropriate medication use according to 2012 Beer's criteria was 40%. By using the formula $N=1.96*2p*q/d^2$ with 95% confidence and 20% allowable error. By applying the value of the p, q, d etc. from previously available study. 171 patients were included in this study. Study was start only after ethical approval on the IEC 1794/Ethics/2021, KGMU Lucknow. Prescription of patient enrolled was be noted down in a paper to be retain for further analyses in case record form. These increases was categories into various category required for application of beer's and STOPP/START criteria. Every visit was be utilized for detail prescription (change if any) and find ADR. Patient was be given telephone number to primary investigator observe reported ADR since beginning further detailed information regarding any ADR was be taken out to be analysed by using Naranjo Scale and Hartwig's Severity scale.

Inclusion criteria

- Patient age ≥65
- Either sex
- Willing to give consent

Exclusion criteria

- Terminally ill patient
- Patient does not give consent

Results

Table 1: Demographic profile of respondents

		N	%
Age intervals	65-75 years	152	88.9%
	76-85 years	18	10.5%
	>85 years	1	.6%
Sex	Male	126	73.7%
	Female	45	26.3%
MARITAL STATUS	Married	137	80.1%

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

	Unmarried	1	.6%
	Widower	20	11.7%
	Widowed	13	7.6%
RELIGION	Hindu	129	75.4%
	Muslim	42	24.6%
TYPES OF FAMILY	Joint Family	136	79.5%
	Nuclear Family	35	20.5%
EDUCATIONAL STATUS	Primary	5	2.9%
	Junior High School	9	5.3%
	High School	28	16.4%
	Intermediate	10	5.8%
	Graduate	62	36.3%
	Postgraduate	16	9.4%
	Illiterate	41	24.0%
SOCIOECONOMIC STATUS	Lower class	18	10.5%
	Middle class	87	50.9%
	Upper class	66	38.6%
RESIDENCE AREA	Urban	97	56.7%
	Rural	74	43.3%

Table 1 shows the frequency distribution of age intervals of the study subjects. 88.9% patients were in the age range of 65-75 years, 10.5% in 76-85 years and 0.6% in the age range of more than 85 years. Mean age was 69.15±4.82 years with median of 67 years. Minimum age was 65 years and maximum age was 92 years. Above table shows the sex ratio of the study population. It is observed that 737% were make and 26.3% were females.

Table 2: Distribution of age intervals according to their polypharmacy.

Age intervals	Polypharmacy (>=5 drugs)					
	Absent		Present		Total	
	N	%	N	%	N	%
65-75 years	52	82.5%	100	92.6%	152	88.9%
76-85 years	11	17.5%	7	6.5%	18	10.5%
>85 years	0	.0%	1	.9%	1	.6%
Total	63	100.0%	108	100.0%	171	100.0%

p value=0.061

Table 2 shows the association of age intervals of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 92.6% in the age range of 65-75 years, 6.5% in age range of 76-85 years and0.9% in more than 85 years. There was no significant difference found in the above association.

Table 3: Distribution of gender according to their polypharmacy.

Sex	Polypharmacy (>=5 drugs)					
	Absent		Present		Total	
	N	%	N	%	N	%
Male	44	69.8%	82	75.9%	126	73.7%
Female	19	30.2%	26	24.1%	45	26.3%
Total	63	100.0%	108	100.0%	171	100.0%

Table 3 shows the association of sex ratio of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 75.9% males and 24.1% females. There was no significant difference found in the above association.

The association of marital status of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 78.7% married, 13.9% widower and 7.4%

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

widowed. There was no significant difference found in the above association. The association of religion belief of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 73.1% being Hindu and 26.9% being Muslim. There was no significant difference found in the above association. The association of type of family of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 78.7% were living in a joint family and 21.3% were living in a nuclear family. There was no significant difference found in the above association. The association of education status of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects 3.7% primary pass, 4.6% junior high school pass, 17.6% high school pass, 5.6% intermediate pass, 34.3% graduate pass, 8.3% postgraduate and 25.9% illiterate. There was no significant association found in the above association. The association of socioeconomic status of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 13% lower class, 50% middle class and 37% were upper class. There was no significant difference found in the above association. The association of residence area of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 54.6% were living in a urban area and 45.4% were living in a rural area. There was no significant difference found in the above association. The association of family h/o any disease of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 53.7% had history of a disease and 46.3% had no history of any disease. When family H/o disease was associated with polypharmacy, a significant difference was found (p value= 0.001).

Table 4: Distribution of habits according to their polypharmacy.

		Polypharmacy (>=5 drugs)						p value
		Absent		Present		Total		
		N	%	N	%	N	%	
Tobacco consumption	No	28	44.4%	48	44.4%	76	44.4%	1.000
	Yes	35	55.6%	60	55.6%	95	55.6%	
	Total	63	100.0%	108	100.0%	171	100.0%	
Alcohol consumption	No	10	15.9%	22	20.4%	32	18.7%	0.467
	Yes	53	84.1%	86	79.6%	138	80.7%	
	Total	63	100.0%	108	100.0%	171	100.0%	
Smoking	No	11	17.5%	26	24.1%	37	21.6%	0.311
	Yes	52	82.5%	82	75.9%	134	78.4%	
	Total	63	100.0%	108	100.0%	171	100.0%	
Substance abuse	No	30	47.6%	52	48.1%	82	48.0%	0.947
	Yes	33	52.4%	56	51.9%	89	52.0%	
	Total	63	100.0%	108	100.0%	171	100.0%	

Table 4 shows the association of bad habits of the study subjects with polypharmacy present and absent. Polypharmacy present includes 55.6% subjects who consume tobacco, 79.6% drinks alcohol, 75.9% smoke and 51.9% do substance abuse. There was no significant association found when the above stated parameters were associated.

Table 5: Distribution of activities according to their polypharmacy

		Polypharmacy (>=5 drugs)						p value
		Absent		Present		Total		
		N	%	N	%	N	%	
Diet	Veg	21	33.3%	37	34.3%	57	33.3%	0.902
	Non-Veg	42	66.7%	71	65.7%	112	65.5%	
	Total	63	100.0%	108	100.0%	171	100.0%	
Exercise	Routine	13	20.6%	18	16.7%	31	18.1%	0.348

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

	Occasional	24	38.1%	33	30.6%	57	33.3%	
	No	26	41.3%	57	52.8%	83	48.5%	
	Total	63	100.0%	108	100.0%	171	100.0%	
Physical activity	No	6	9.5%	4	3.7%	10	5.8%	0.125
	Moderate	13	20.6%	34	31.5%	47	27.5%	
	Mild	44	69.8%	70	64.8%	114	66.7%	
	Total	63	100.0%	108	100.0%	171	100.0%	

Table 5 shows the association of diet, exercise and physical activity of the study subjects with polypharmacy present and absent. Polypharmacy present includes 34.3% vegetarians and 65.5% non-vegetarians. 16.7% do routine exercise, 30.6% do occasional exercise and 52.8% do no exercise. 31.5% do moderate physical activity and 64.8% to mild activity while rest do none. There was no significant association found when the above stated parameters were associated.

Table 6: Distribution of patient's anthropometry status according to their polypharmacy

	Polypharmacy (>=5 drugs)						**p value**
	Absent		**Present**		**Total**		
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	
WEIGHT (KG)	64.58	11.31	67.06	10.34	66.15	10.74	0.085
HEIGHT Meter	1.64	.09	3.30	17.16	2.69	13.64	0.529
BMI	24.03	4.14	24.69	4.04	24.45	4.07	0.234

Table 6 shows the mean association of weight, height and BMI in the study subjects with polypharmacy present and absent. Polypharmacy present had mean weight 67.06±10.34 kg, mean BMI was 24.39± 4.04 and mean height 3.30±17.16 m. There was no significant mean change observed in the above association. The above stated parameters were more in present group than absent group.

Table 7: Distribution of duration of disease according to their polypharmacy

	Polypharmacy (>=5 drugs)						**p value**
	Absent		**Present**		**Total**		
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	
Duration of disease	8.48	7.78	13.01	8.86	11.34	8.73	**<0.001**

Table 7 shows the mean association of duration of disease in the study subjects with polypharmacy present and absent. Polypharmacy present had mean duration as 13.01±8.86. There was a significant mean change observed in the above association (p value= <0.001). duration of disease was more in present group than the absent group.

Table 8: Distribution of average no. of drug per day according to their polypharmacy.

Average no. of drug per day	**Polypharmacy (>=5 drugs)**					
	Absent		**Present**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**
<5	63	100.0%	0	.0%	63	36.8%
5-9	0	.0%	69	63.9%	69	40.4%
10-14	0	.0%	35	32.4%	35	20.5%
>15	0	.0%	4	3.7%	4	2.3%

p value=**<0.001**

Table 8 shows the association of average no. of drug per day with polypharmacy. In polypharmacy present, 63.9% were 5-9 avg. no. of drug per day and 32.4% were 10-14 drug per day and 3.7% were >=15 drug per day. There was a significant association found when above associated.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

Table 9: Distribution of comorbidities and complications according to their polypharmacy.

		Polypharmacy (>=5 drugs)						p value
		Absent		Present		Total		
		N	%	N	%	N	%	
CO-MORBIDITIES	Yes	22	34.9%	75	69.4%	97	56.7%	**<0.001**
	No	41	65.1%	33	30.6%	74	43.3%	
	Total	63	100.0%	108	100.0%	171	100.0%	
COMPLICATIONS	Yes	11	17.5%	26	24.1%	37	21.6%	0.311
	No	52	82.5%	82	75.9%	134	78.4%	
	Total	63	100.0%	108	100.0%	171	100.0%	

Table 9 shows the association of comorbidities and complications with polypharmacy present and absent. In polypharmacy present, 69.4% subjects had comorbidities and 24.1% had complications. Comorbidities shows a significant difference when associated within polypharmacy; present or absent. It is observed that no. of drugs in use decreased due to any comorbidity present.

Diabetes was most common clinical condition [76.02] and Hypertension is 2and most common clinical condition associated in my study. The association of BMI of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 27.8% were overweight, 13.9% were obese and 1.9% were underweight. The above association was not significant (p value= 0.705).

Table 10: Association of Beer's criteria according to their polypharmacy.

Beer's criteria	Polypharmacy (>=5 drugs)					
	Absent		Present		Total	
	N	%	N	%	N	%
Appropriate	49	77.8%	68	63.0%	117	68.4%
Potentially inappropriate	14	22.2%	40	37.0%	54	31.6%
Total	63	100.0%	108	100.0%	171	100.0%

p value=**0.044**

Table 10 shows the association of Beer's criteria of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 63% not definitely inappropriate and 37% potentially inappropriate. The above association was significant (p value= 0.044).

Table 11: Association of START/STOPP criteria according to their polypharmacy.

START/STOPP CRITERIA	Polypharmacy (>=5 drugs)					
	Absent		Present		Total	
	N	%	N	%	N	%
START	55	87.3%	71	65.8%	126	73.7%
STOPP	8	12.7%	37	34.3%	45	26.3%
Total	63	100.0%	108	100.0%	171	100.0%

p value=**0.002**

Table 11 shows the association of STOPP/ START criteria of the study subjects with polypharmacy present and absent. Polypharmacy present includes subjects as 73.7% START, 26.3% STOPP. The above association was significant. (p value= 0.002).

Table 12: Distribution of NARANJO scale according to their polypharmacy.

Naranjo Scale	N	%
P0SSIBLE	49	79.3
PROBABLE	13	20.97
Total	62	100.0

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

Table 12 shows the distribution of NARANJO scale of the study subjects. 79.3% were possible and 20.97% were probable.

Table 13: Distribution of Hertwig's Severity scale according to their polypharmacy.

Hertwig's Severity Scale	N	%
LEVEL-1	52	83.9
LEVEL-3	10	16.1
Total	62	100.0

Table 14: Association of Hertwig's Severity scale according to their Beer's Criteria

Hertwig's Severity Scale	Beer's Criteria			
	Appropriate		Potentially Inapproprite	
	N	%	N	%
LEVEL-1	35	87.5%	17	77.3%
LEVEL-3	5	12.5%	5	9.3%

p-value=0.294

Table 15: Association of Naranjo Scale according to their Beer's Criteria.

Naranjo Scale	Beer's Criteria			
	Appropriate		Potentially Inapproprite	
	N	%	N	%
P0SSIBLE	34	85%	15	68.2%
PROBABLE	6	15%	7	31.8%

p-value=0.119

Above table shows the Distribution of HERTWIG'S SEVERITY scale of the study subjects. [83.9 %] were Level - 1 and [16.1%] were level -3. Total 62 ADR were reported in which 22 patients were taking potential inappropriate medication, but this association is insignificant.

Table 16: Association of AYUSH medicine scale according to their polypharmacy.

AHUSH medicine	Polypharmacy (>=5 drugs)						p-value
	Absent		Present		Total		
	N	%	N	%	N	%	
Present	12	38.7%	19	61.3%	31	100.0%	0.812
Absent	51	36.4%	89	63.6%	140	100.0%	

Above table shows the association of AYUSH medicine taken by study subjects with polypharmacy. In polypharmacy present, 61.3% were present and 63.6% were absent. The association was not significant and p value in 0.812.

Discussion

The study reveal male patients were [73.7%] and female patients were [26.3%] Similarly, study conducted by [Subeesh et al, 2017] reported male [61%] and female [39%] Another similar study conducted [Borah et al,2017] reported male [65%] and female [35%].[8,9] Demographic profile the study reveals that highest number of respondents were in the age group 65-75 years (88.9%), and minimum, (0.6%) were aged above 85 years. Mean age of the respondents was 69.15±4.82 which differed from the mean age of other studies 71.14±8.16 years and 80.24 years.[7]

Polypharmacy was found to be predominant among male [75.9 %] and female [24.1%] like this study conducted Nagaraju also reported that male is more susceptible to polypharmacy. The male predominance of polypharmacy among geriatric is probably due to male is more health conscious and more prone for multiple co-morbidities.[8] Polypharmacy was found to be maximum among age interval 65-75 years [92.6%] in comparison to other age interval.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

Polypharmacy was found to be maximum among Married patients [78.7%] comparison to other in our study. Polypharmacy was found to be maximum Joint family [78.7%] in comparison to nuclear family. In education status Graduates were highest [34%] of polypharmacy.

In our study out of 171 geriatric patients' polypharmacy use of more than 5 drugs per day was found in [63.2%] of individuals. Similar study done by [Borah et al 2016] was observed polypharmacy [78%].[8] In contrast, polypharmacy was observed only in16.5% patient in a study conducted in Pondicherry. Average number of drugs per prescription as we found was 7.18 [1229/171] which show polypharmacy Similar to our study [Subeesh et al, 2017] found average number of drugs per prescription was [9.68].[9] In contrast to study done in Brazil [3.9] which is equal to a study done in Nigeria [3.9] which was less than that observed in our study. The reason for that is coexistence of more than one comorbid condition in geriatric patients. This can lead to multiple drug -drug interaction and serious adverse effects.[10,11]

In polypharmacy present, 69.4% subjects had comorbidities. Maximum number of polypharmacy found average no of drug used per day [5-9] were [63.9%]. A statistically significant association was observed between comorbidities and polypharmacy. In polypharmacy present, 24.1% had complications in comparison 75.9% had polypharmacy but no complications less no. of pts were polypharmacy with complication due to stoppage of many drugs in complication. In present study most common associated clinical condition was type -2 Diabetes mellitus [76.02%], hypertension [52.63%], CAD [11.70%], BPH [7.60], COPD [7.02%], Parkinson's [2.34%], CVA [1.75%], CKD [1.75%], Hypothyroidism [1.75%], Other [11.11%] Similar to our study [Subeesh et al, 2017] found [43%], hypertension [61; 29%] and 37 [18%] were suffering from cardiovascular disease (CVD).[9] According to International Diabetic Foundation (IDF), India has maximum number of diabetes patients than any other country. A statistically significant association was observed between comorbidities and polypharmacy. This shows that as the age progresses, the chance of multiple comorbidities is common which in turn reflects the prevalence of polypharmacy among geriatrics.[12]

In our study Polypharmacy present had mean duration as 13.01±8.86. There was a significant mean change observed in the association. It is probably due when duration of disease increase comorbidities also increases, so the polypharmacy. This observation goes in the same tune as the study conducted by [Ersoy S et al] where chronic diseases with prolonged duration were associated with the polypharmacy.[13]

Polypharmacy present includes subjects as 53.7% had history of a disease and 46.3% had no history of any disease. When family H/o disease was associated with polypharmacy, a significant difference was found (p value= 0.001). none of article found to relate family history and polypharmacy. Probable reason is due to most of patients in our study were Diabetes and Hypertension both were familial disease. Priya et al 2018 suggested that prevalence of joint disorder was highest, followed by hypertension, diabetes mellitus, respiratory and sleep disorder. Some similarity to the prospective multi- centre cross-sectional study conducted among the population of the three districts (Nablus, Tulkarm, and Jenin) revealing the commonest disease affecting elderly was hypertension, followed by joint diseases, diabetes mellitus, and cardiovascular disease.[7] The maximum number of medications were taken for respiratory disorders (68.5%), followed by (60.4%) for Hypertension & CVDs, (57.1%) for Diabetes Mellitus, (53.1%) for Joint Disorders and (22.1%) for Depression & Sleep disorders. However, a cross sectional study carried out in Hassan revealed that the most common medication was used for Gastro intestinal disorders (78.3%) [7] In this study by applying Beer criteria potentially inappropriate medication [31.6%] and appropriate medication found [68.4%]. Similar study done by [Prabhu M et al] found PIM in elderly to be [87.3%].[14] Polypharmacy present includes subjects as 63% not definitely

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

inappropriate and 37% potentially inappropriate. The above association was significant. In this study by applying START/ STOPP criteria [73.7%] START, 26.3% STOPP. out of STOPP 34.3% was found polypharmacy. In our study out of 171 patients ADRs were reported from elderly age group which constitutes for 36.25%. Similar study [Jayanthi et al] was found 11% ADRs.[15] The distribution of NARANJO scale of the study subjects. 79.3% were possible and 20.97% were probable. In contrast to our study [Prabhu M et al] found majorly probable [90%] and possible [2.4%].[14] Distribution of HERTWIG'S SEVERITY scale of the study subjects. [83.9 %] were Level -1 and [16.1%] were level -3. Out of 62 patients 52 were mild severity and 10 patients were moderate severity. In contrast to our study [Prabhu M et al] found 83.0% moderate severity. Total 62 ADR were reported in which 22 patients were taking potential inappropriate medication. 31 patients out of 171 taking AYUSH medicine [61.3%] were present polypharmacy but association is not significant.

Conclusion

We concluded that the AGS Beers Criteria in clinical practise in the geriatric population should inspire the prescribers. Strict measures should be adopted to implement medical reconciliation practises in centres caring for older patients with numerous comorbidities because the problem of polypharmacy and potentially inappropriate treatment is rising in developing countries.

References

1. Schenker Y, Park SY, Jeong K, Pruskowski J, Kavalieratos D, Resick J, et al. Associations Between Polypharmacy, Symptom Burden, and Quality of Life in Patients with Advanced, Life-Limiting Illness. J Gen Intern Med. 2019 Apr 15;34(4):559–66.
2. Bhagavathula AS, Vidyasagar K, Chhabra M, Rashid M, Sharma R, Bandari DK, et al. Prevalence of Polypharmacy, Hyperpolypharmacy and Potentially Inappropriate Medication Use in Older Adults in India: A Systematic Review and Meta-Analysis. Vol. 12, Frontiers in Pharmacology. Frontiers Media S.A.; 2021.
3. Lexow M, Wernecke K, Schmid GL, Sultzer R, Bertsche T, Schiek S. Considering additive effects of polypharmacy: Analysis of adverse events in geriatric patients in long-term care facilities. Wien Klin Wochenschr. 2021 Aug 1;133(15–16):816–24.
4. Yayla ME, Bilge U, Binen E, Keskin A. The Use of START/STOPP criteria for elderly patients in primary care. The Scientific World Journal. 2013;2013.
5. Kumari S, Jain S, Kumar S. Effects of Polypharmacy in Elderly Diabetic Patients: A Review. Cureus. 2022 Sep 12;
6. Romskaug R, Skovlund E, Straand J, Molden E, Kersten H, Pitkala KH, et al. Effect of Clinical Geriatric Assessments and Collaborative Medication Reviews by Geriatrician and Family Physician for Improving Health-Related Quality of Life in Home-Dwelling Older Patients Receiving Polypharmacy: A Cluster Randomized Clinical Trial. JAMA Intern Med. 2020 Feb 1;180(2):181–9.
7. Priya S, Nl G, Hs C. Polypharmacy-prevalence and risk factors among elderly patients in government medical college, Tanda, Distt Kangra (HP).
8. Borah L, Devi D, Debnath PK, Deka D. A study of drug utilization pattern of the geriatric patients in the department of geriatric medicine in a tertiary care hospital in Assam, India. Asian Journal of Pharmaceutical and Clinical Research. 2017 Feb 1;10(2):122–6.
9. Subeesh VK, Gouri N, Beulah ET, Shivashankar V. A prospective observational study on polypharmacy in geriatrics at a private corporate hospital. J Appl Pharm Sci. 2017 Oct1;7(10):162–7.
10. Eze UI, Olowu AO. Prescribing Patterns and Inappropriate Use of Medications in Elderly Outpatients in a Tertiary Hospital in Nigeria [Internet]. Vol. 10, Tropical Journal of

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

Pharmaceutical Research. 2011. Available from: http://www.tjpr.org
11. pharmpract-05-179[NEW-2].
12. Gupta R, Malhotra A, Malhotra P. A study on polypharmacy among elderly medicine in-patients of a tertiary care teaching hospital of North India. Natl J Physiol Pharm Pharmacol. 2018;8(9):1297.
13. Ersoy S, Engin VS. Risk factors for polypharmacy in older adults in a primary care setting: A cross-sectional study. Clin Interv Aging. 2018;13:2003–11.
14. Prabhu M, Ranganath Pai SK. Monitoring of adverse reactions in geriatric south Indian patients in a tertiary care teaching hospital: A prospective study [Internet]. Article in Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2016. Available from: https://www.researchgate.net/publication/292464489
15. Jayanthi CR, Renuka M, Panchaksharimath P. An observational study to analyze the adverse drug reactions among the elderly at a tertiary care hospital. Biomedical and Pharmacology Journal. 2017;10(1):345–52.