Drug Utilization Pattern in Elderly Hospitalized Patients in Tertiary Care Hospitals of Quetta, Pakistan

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Abstract

Background: Changes in Pharmacokinetics and pharmacodynamics in different age groups, especially in elderly age group, have extensively been documented and studied and concurrent chronic diseases may underlie polypharmacy in elderly. **Aim:** The aim of this study was to assess drug utilization pattern in elderly hospitalized patients in tertiary care hospitals of Quetta. **Methods:** Specifically, designed questionnaire based, cross sectional study was conducted in Bolan Medical Complex Hospital and Sandeman Provincial Hospital Quetta with total of 397 participants. Non-Probability convenience sampling technique was used in this study. Cronbach alpha test was applied to check reliability of questionnaire, Cronbach alpha value was 0.886 that is acceptable range. **Results:** Majority of the participants were from age group 60 to 70 years (n=301, 75.8%), fever and cough were present in majority of hospitalized patients (n=180,11.7%). Majority (n=232, 58.4%) of participants were having uncontrolled disease with yearly health service utilization of more than 3 times (n=234, 58.9), medication recommended to majority (146, 36.8%) of participants were 4. Ceftriaxone was mostly prescribed in cough (n=162,90%), hypertension (n=114, 67.1%), fever (n=154, 85.6%) of cases, while in gastritis omeprazole was mostly prescribed (n=84, 73.7%). Most of the hospitalized patients were complaint to ceftriaxone, omeprazole, dimenhydrinate and diclofenac sodium. **Conclusion:** Ceftriaxone was most prescribed drugs among elderly patients that were admitted in different specialty departments. Most of the elderly patients had uncontrolled disease status. This study concluded that the compliance to medication was 82.1% of elderly patients.

Key words: Compliance, Drug Utilization, Drug utilization pattern, Elderly hospitalized patients, Quetta.

INTRODUCTION

According to report of United Nations, in about even less than 4 decades that is between in time of 2012 to 2050, age of population in the world has changed dramatically, over the years and still changing continuously.[1] The population of world having age 60 or older will be double than current population of world and will be increased to 2.03 billion and the population having age 80 or more will be more than 3-fold of current population of this age group.[2] According to report by world health organization, population percentage of people that are 60 years or older are 5.6% and that is estimated to be doubled to almost 11% by 2025.[3]

The patients aged 60 years, or more are considered more prone to chronic diseases due to the changes that are physiological changes and age-related effects,[4] and according to study almost 80% of elderly people have chronic diseases.[5] Drug usage has increased in elderly patients, as in prevalence of more than one chronic diseases to patients increased, that is why they are more prone to decrease in compliance due to polypharmacy, drug- drug interactions and drug related adverse effects.[6]

In Pakistan the data is scarce on drug utilization among patients older than 60 years and polypharmacy drug prescription and utilization is less studied. The total expenditure of health has increased in Pakistan because large percentage of elderly patients are using more than 5 medicines per day.[7]

The research of drug utilization assess the impact and utilization of drugs and is has important role in assessing medication needs of individual patients as per their needs and also provides prioritization of drugs in national of regional formularies, and results from surveys of drug utilization help in improvement in rational use of drugs.[8]

After extensive literature review, no such study was found and considering the importance of drug utilization review, this study was conducted in Quetta, Pakistan.

MATERIALS AND METHODS

Study design, setting and duration: This study was prospective, cross sectional and questionnaire-based study conducted in Sandeman Provincial Hospital (SPH) and Bolan Medical Complex Hospital (BMCH) Quetta, Pakistan. Duration of this study was 08 months that is from February to September 2022.

Study population: All the elderly patients hospitalized in Sandeman

Provincial Hospital (SPH) and Bolan Medical Complex Hospital (BMCH) Quetta were study population.

Sample size: Rao Soft sample size calculator was used to calculate sample size,[9] 50% of response distribution, 5% margin of error and 95% confidence interval was given as input which resulted in sample size of 385. Total of 450 questionnaires were used out which 397 were considered valid and included in study.

Sampling technique: Nonprobability simple convenience sampling technique used in this study.

Inclusion and exclusion criteria: All the patient above age 60 years and ready to participate in the study were included in study while those having age less than 60 years and were no willing to participate in study were excluded from the study.

Study Questionnaire: Specifically designed questionnaire were used to conduct this study with the help of some previous studies and after extensive literature review.[10-13] Total of 16 questions were added to questionnaire which was divided among 2 sections. Section 1 contained questions regarding demographic characteristics and comprised 7 questions, section 2 contained questions regarding disease area, disease status, hospitalization, treatment status, treatment duration, compliance etc. and comprised of 9 questions.

Reliability and validity: Content and face validity was conducted by distributing the initial questionnaire among experts of Faculty of pharmacy and the experts were asked about their level of agreement to questions, any question they want to remove or any information that need to be added

to questionnaire. Content validity was conducted by asking the experts for sorting the questions as per question importance and relevance. Cronbach alpha test was applied to check reliability of questionnaire, Cronbach alpha value was 0.886 that is acceptable range.[14]

Statistical analysis: Statistical package for social sciences (SPSS) version 21 were used for analysis of this study. Descriptive statistics were applied for analysis in this study and its results were computed and summarized as frequency and percentages.

Ethical Considerations: Consent was taken before filling the questionnaire from participants which clearly stated that participation in this study is voluntary, and the participant can leave the study at any level. The information provided by the participant will be kept confidential. Approval was taken from University of Balochistan's ethical committee before conducting this study.

RESULTS

Demographic Characteristics are summarized in Table 1, Majority of the participants were from age group 60 to 70 years (n=301, 75.8%), while (n=208, 52.4%) of the participants were from rural locality with male dominance participation (n= 291, 73.3%). Majority (n=385, 97%) were married while (n=128,32.2%) of participants were uneducated and unemployed. Monthly income of majority (n=134,33.85) of participants were from 5000-10000 PKR.

Table 1: Demographic Characteristics.

Description	Frequency	Percentage (%)
Locality		
Urban	189	47.6
Rural	208	52.4
Age group		
60-70	301	75.8
71-80	77	19.4
81-90	16	4.0
91-100	3	0.8
Gender		
Male	291	73.3
Female	106	26.7
Marital Status		
Married	385	97.0
Single	12	3.0
Education		
Uneducated	128	32.2
Religious Education	116	29.2
Primary	63	15.9
Matric	46	11.6
Intermediate	32	8.1
Graduation	12	3.0
Occupation		
Unemployed	128	32.2
Housewife	80	20.2
Government. servant	38	9.6
Private Job	35	8.8
Business	56	14.1
Others	60	15.1
Monthly Income		
5000-10000	134	33.8
10001-20000	89	22.4
20001-30000	74	18.6
>30000	52	13.1
Nothing	48	12.1

Table 2: Disease characteristics of hospitalized patients.

Description	Frequency	Percentage (%)
Fever	180	11.70
Cough	180	11.70
Hypertension	170	11.10
Shortness of breath	126	8.20
Gastritis	114	7.40
Diabetes mellitus	87	5.70
Body ache	87	5.70
Chronic obstructive pulmonary disease	66	4.30
HCV	44	2.90
Vomiting	42	2.70
Tuberculosis	40	2.60
Arthritis	38	2.50
Malaria	37	2.40
Pneumonia	34	2.20
RTI	32	2.10
Chronic liver disease	29	1.90
Anorexia	28	1.80
Asthma	26	1.70
Epigastric pain	18	1.20
Diarrhea	18	1.20
Urinary Tract infection	16	1.00
Acute exacerbation of chronic bronchitis	16	1.00
Diabetic neuropathy	16	1.00
Ischemic heart disease	14	0.90
Malabsorption syndrome	12	0.80
Hepatic lymphoma	10	0.70
Typhoid	10	0.70
Liver Abscess	8	0.50
Sore Throat	8	0.50
Polycythemia vera thromboembolism	8	0.50
Addison disease	8	0.50
Constipation	8	0.50
Lymphoprolacrimia	4	0.30

Diseases characteristics of hospitalized patients are summarized in Table 2. Fever and cough were present in majority of hospitalized patients (*n*=180,11.7%) preceded by hypertension (*n*=170,11.1%), shortness of breath (*n*=126, 8.2%) and gastritis (*n*=114, 7.4%).

Disease status,risks and health service utilization is summarized in Table 3, Majority (*n*=232, 58.4%) of participants were having uncontrolled disease with yearly health service utilization of more than 3 times (*n*=234, 58.9), while majority (*n*=138, 34.8) were not having significant risk factors for their diseases.

Table 3: Disease status, risks, and health service utilization of hospitalized patients.

Description	Frequency	Percentage
Disease status controlled uncontrolled	165 232	41.6 58.4
Health Service Utilization in year 1 to 3 times more than 3 times	163 234	41.1 58.9
Health risks smoking obesity non risk others	101 136 138 22	25.4 34.3 34.8 5.5

Table 4: Medication administration to hospitalized patients.

Description	Frequency	Percentage (%)
Ceftriaxone	287	14.90
Omeprazole	238	12.40
Dimenhydrinate	84	4.40
Diclofenac Sodium	82	4.30
Metronidazole	82	4.30
Acetaminophen	79	4.10
Esomeprazole	70	3.60
Hydrocortisone sodium succinate	70	3.60
Furosemide	64	3.30
Insulin	61	3.20
Acetyl salicylic acid	60	3.10
Levofloxacin	48	2.50
Lactulose	48	2.50
Ciprofloxacin	46	2.40
Renacid	46	2.40
Azithromycin	44	2.30
Drotaverine	44	2.30
Losartan	38	2.00
Tramadol	36	1.90
Atorvastatin	32	1.70
Domperidone	28	1.50
Pregabalin	26	1.30
Iron Sucrose	26	1.30
Vitamin k	24	1.20
Dexamethasone	22	1.10
Aspirin	20	1.00
Quinine	17	0.90
CO Amoxiclav	16	0.80
Rosuvastatin	16	0.80
Vit B complex	16	0.80
Metoclopramide	16	0.80
Vitamin D	14	0.70
Ketorolac	10	0.50
Imipenem/ Cilastatin	10	0.50
Ranitidine	10	0.50
Ramipril	9	0.50
Clarithromycin	8	0.40
Metformin	8	0.40
Rifaximin	8	0.40
Metoprolol Tartrate	8	0.40
Dopamine	8	0.40
Allopurinol	8	0.40
Hydroxyurea	8	0.40
Clopidogrel	8	0.40
Nystatin	8	0.40
Digoxin	4	0.20
Amino Acid	4	0.20
Etizolam	4	0.20
Lisinopril	2	0.10
Acyclovir	1	0.10
Montelukast	1	0.10

Table 4 summarizes the medication status to hospitalized elderly participants. Ceftriaxone (*n*=287, 14.9%) were mostly prescribed to elderly hospitalized patients along with Omeprazole (*n*= 238, 12.4%), dimenhydrate (*n*=84, 4.40%), while diclofenac Sodium and metronidazole were prescribed to (*n*=82, 4.3%) of participants.

Table 5: Treatment and compliance status of hospitalized elderly patients.

Description	Frequency	Percentage (%)
Presence of old prescription Yes No	56 341	14.1 85.9
Compliance with prescription yes No	326 71	82.1 17.9
Medicines recommended 3 4 5 6 7 8 9	58 146 106 25 33 11 18	14.6 36.8 26.7 6.3 8.3 2.8 4.5
Treatment duration 2 3 4 5 6 10 12	100 94 111 66 16 2 8	25.2 23.7 28.0 16.6 4.0 0.5 2.0
Dosage form frequency Dosage form IV Dosage form non-IV	397 389	50.5% 49.5%

Treatment and compliance status of hospitalized patients are summarized in Table 5, Majority (*n*= 341, 85.9%) of patients were not having old prescription with them and majority (*n*=326, 82.1%) of participants were complaint to their prescribed medications. Medication recommended to majority (146, 36.8%) of participants were 4, having treatment duration (*n*=111, 28%) of 4 months. Dosage form frequency to majority (397,50.5%)

Table 6: Cross Tabulation of treatment pattern with gender.

Drug	Gender	
	Male	**Female**
Levofloxacin	34 (11.7%)	14 (13.2%)
Clarithromycin	8 (2.7%)	0 (0.0)
Ceftriaxone	195 (67.0%)	92 (86.8%)
Azithromycin	16 (5.5%)	28 (26.4%)
Ciprofloxacin	42 (14.4%)	4 (3.8%)
Diclofenac Sodium	44 (15.1%)	38 (35.8%)
Omeprazole	174 (59.8%)	64 (60.4%)
Esomeprazole	70 (24.1%)	0 (0.0)
Insulin	41 (14.1%)	20 (18.9%)
Metformin	6 (2.1%)	2 (1.9%)
Ketorolac	10 (3.4%)	0 (0.0)
Digoxin	0 (0.0)	4 (3.8%)
Ramipril	9 (3.1%)	0 (0.0)
Acyclovir	1 (0.3%)	0 (0.0)
CO Amoxiclav	8 (2.7%)	8 (7.5%)
Tramadol	26 (8.9%)	10 (9.4%)
Pregabalin	22 (7.6%)	4 (3.8%)
Domperidone	28 (9.6%)	0 (0.0)
Acetaminophen	55 (18.9%)	24 (22.6%)
Renacid	24 (8.2%)	22 (20.8%)
Quinine	17 (5.8%)	0 (0.0)
Atorvastatin	28 (9.6%)	4 (3.8%)
Acetyl salicylic acid	56 (19.2%)	4 (3.8%)
Furosemide	58 (19.9%)	6 (5.7%)
Metronidazole	70 (24.1%)	12 (11.3%)
Aspirin	8 (2.7%)	12 (11.3%)
Rifaximin	8 (2.7%)	0 (0.0)
Losartan	28 (9.6%)	10 (9.4%)
Amino Acid	0 (0.0)	4 (3.8%)
Rosuvastatin	8 (2.7%)	8 (7.5%)
Montelukast	1 (0.3%)	0 (0.0)
Metoprolol Tartrate	8 (2.7%)	0 (0.0)
Vit B complex	6 (2.1%)	10 (9.4%)
Vitamin k	16 (5.5%)	8 (7.5%)
Vitamin D	14 (4.8%)	0 (0.0)
Dopamine	0 (0.0)	8 (7.5%)
Dexamethasone	8 (2.7%)	14 (13.2%)
Etizolam	0 (0.0)	4 (3.8%)
Lactulose	30 (10.3%)	18 (17.0)
Allopurinol	8 2.7%)	0 (0.0)
Drotaverine	34 (11.7%)	10 (9.4%)
Metoclopramide	14 (4.8%)	2 (1.9%)
Dimenhydrinate	58 (19.9%)	26 (24.5%)
Hydroxyurea	8 (2.7%)	0 (0.0)
Lisinopril	0 (0.0)	2 (1.9%)
Hydrocortisone sodium succinate	60 (20.6%)	10 (9.4%)
Iron Sucrose	14 (4.8%)	12 (11.3%)
Imipenem/ Cilastatin	10 (3.4%)	0 (0.0)
Clopidogrel	8 (2.7%)	0 (0.0)
Ranitidine	0 (0.0)	10 (9.4%)
Nystatin	8 (2.7%)	0 (0.0)

of patients were intravenous, while (*n*=389,49.5%) were prescribed non-Intravenous form of medications.

Cross Tabulation of treatment pattern with gender is summarized in Table 6, Majority of hospitalized male patients were prescribed ceftriaxone

Table 7: Cross Tabulation of treatment pattern with Fever.

Drug	Frequency	Percentage
Ceftriaxone	154	85.60
Omeprazole	122	67.80
Acetaminophen	62	34.40
Diclofenac Sodium	52	28.90
Dimenhydrinate	48	26.70
Metronidazole	46	25.60
Acetyl salicylic acid	38	21.10
Azithromycin	36	20.00
Hydrocortisone sodium succinate	34	18.90
Atorvastatin	28	15.60
Tramadol	26	14.40
Esomeprazole	22	12.20
Pregabalin	22	12.20
Lactulose	20	11.10
Furosemide	18	10.00
Dexamethasone	18	10.00
Drotaverine	18	10.00
CO Amoxiclav	16	8.90
Vitamin k	16	8.90
Renacid	12	6.70
Vitamin D	12	6.70
Levofloxacin	10	5.60
Ciprofloxacin	10	5.60
Ketorolac	10	5.60
Domperidone	10	5.60
Vit B complex	10	5.60
Iron Sucrose	10	5.60
Clarithromycin	8	4.40
Insulin	8	4.40
Quinine	8	4.40
Rifaximin	8	4.40

Table 7: Cont'd.

Drug	Frequency	Percentage
Losartan	8	4.40
Metoprolol Tartrate	8	4.40
Allopurinol	8	4.40
Hydroxyurea	8	4.40
Clopidogrel	8	4.40
Metformin	0	0.00
Digoxin	0	0.00
Ramipril	0	0.00
Acyclovir	0	0.00
Aspirin	0	0.00
Amino Acid	0	0.00
Rosuvastatin	0	0.00
Montelukast	0	0.00
Dopamine	0	0.00
Etizolam	0	0.00
Metoclopramide	0	0.00
Lisinopril	0	0.00
Imipenem/ Cilastatin	0	0.00
Ranitidine	0	0.00
Nystatin	0	0.00
Vitamin k	8	7.00
Imipenem/ Cilastatin	8	7.00
Nystatin	8	7.00
Metformin	4	3.50
Metoclopramide	2	1.80
Lisinopril	2	1.80
Ranitidine	2	1.80

(n=195, 67%), omeprazole (n=174, 59.8%), esomeprazole (n=70, 24.1%) and acetaminophen (n=70,24.1%). Majority of female patients were prescribed ceftriaxone (n=86.8%), omeprazole (64, 60.4%), diclofenac sodium (n=38, 35.8%) and azithromycin (n= 28, 26.4).

Cross Tabulation of treatment pattern with Fever is summarized in Table 7, Ceftriaxone was prescribed to majority (n=154,85.6) of hospitalized patients who were febrile along with omeprazole (n=122, 67.8%), acetaminophen (n=62, 34.4%) and diclofenac sodium (n=52, 28.9%) were prescribed to hospitalized elderly patients.

Table 8: Cross tabulation of treatment pattern with Gastritis.

Drug	Frequency	Percentage
Omeprazole	84	73.70
Ceftriaxone	68	59.60
Metronidazole	48	42.10
Diclofenac Sodium	36	31.60
Dimenhydrinate	32	28.10
Ciprofloxacin	28	24.60
Lactulose	24	21.10
Losartan	18	15.80
Drotaverine	18	15.80
Hydrocortisone sodium succinate	18	15.80
Furosemide	16	14.00
Acetyl salicylic acid	12	10.50
Levofloxacin	10	8.80
Azithromycin	10	8.80
Tramadol	10	8.80
Domperidone	10	8.80
Renacid	10	8.80
Vit B complex	10	8.80
Dexamethasone	10	8.80
Esomeprazole	8	7.00
Insulin	8	7.00
CO Amoxiclav	8	7.00
Acetaminophen	8	7.00

Table 9: Cross tabulation of treatment pattern with Hypertension.

Drug	Frequency	Percentage
Ceftriaxone	114	67.10
Omeprazole	98	57.60
Diclofenac Sodium	48	28.20
Furosemide	44	25.90
Dimenhydrinate	44	25.90
Hydrocortisone sodium succinate	42	24.70
Acetaminophen	38	22.40
Metronidazole	36	21.20
Esomeprazole	32	18.80
Insulin	32	18.80
Acetyl salicylic acid	30	17.60
Losartan	30	17.60
Atorvastatin	28	16.50
Pregabalin	26	15.30
Levofloxacin	18	10.60
Azithromycin	18	10.60
Renacid	18	10.60
Ciprofloxacin	16	9.40
Metoclopramide	16	9.40
Vit B complex	12	7.10
Ketorolac	10	5.90
Dexamethasone	10	5.90
Lactulose	10	5.90
Iron Sucrose	10	5.90
Imipenem/ Cilastatin	10	5.90
Ramipril	8	4.70
Tramadol	8	4.70
Quinine	8	4.70
Aspirin	8	4.70
Rosuvastatin	8	4.70
Metoprolol Tartrate	8	4.70
Allopurinol	8	4.70
Drotaverine	8	4.70
Hydroxyurea	8	4.70
Clopidogrel	8	4.70
Metformin	2	1.20
Vitamin D	2	1.20

Cross Tabulation of treatment pattern with Gastritis is summarized in Table 8, In gastritis hospitalized patients, omeprazole was mostly prescribed (*n*=84, 73.7%) along with ceftriaxone (*n*=68,59.6%), metronidazole (*n*=48,42.1%) and diclofenac sodium to (*n*=36, 31.6%) of hospitalized patients.

Table 10: Cross tabulation of treatment pattern with Cough.

Drug	Frequency	Percentage
Ceftriaxone	162	90.00
Omeprazole	130	72.20
Hydrocortisone sodium succinate	54	30.00
Acetyl salicylic acid	46	25.60
Azithromycin	44	24.40
Metronidazole	36	20.00
Acetaminophen	34	18.90
Lactulose	30	16.70
Diclofenac Sodium	28	15.60
Esomeprazole	28	15.60
Dimenhydrinate	28	15.60
Tramadol	26	14.40
Atorvastatin	26	14.40
Levofloxacin	18	10.00
Furosemide	18	10.00
Drotaverine	18	10.00
Iron Sucrose	18	10.00
Vit B complex	16	8.90
Renacid	14	7.80
Ketorolac	10	5.60
Pregabalin	10	5.60
Losartan	10	5.60
Dexamethasone	10	5.60
Clarithromycin	8	4.40
Ciprofloxacin	8	4.40
Domperidone	8	4.40
Quinine	8	4.40
Rifaximin	8	4.40
Metoprolol Tartrate	8	4.40
Vitamin k	8	4.40
Allopurinol	8	4.40
Hydroxyurea	8	4.40
Insulin	4	2.20
Metformin	4	2.20
Amino Acid	4	2.20
Vitamin D	4	2.20
Etizolam	4	2.20
Metoclopramide	2	1.10
Imipenem/ Cilastatin	2	1.10

Cross Tabulation of treatment pattern with Hypertension is summarized in Table 9, In hospitalized elderly patients suffering from hypertension, ceftriaxone was mostly prescribed (*n*= 114, 67.1%) along with omeprazole (*n*=98,57.6%), diclofenac sodium (*n*=48, 28.2%) and furosemide to (*n*=44,25.9%) of hypertensive hospitalized patients.

Table 11: Cross tabulation of treatment pattern with Compliance (Multiple responses).

Drug	Complaint		Non-Complaint	
	Frequency	Percentage	Frequency	Percentage
Ceftriaxone	240	73.60	47	66.20
Omeprazole	186	57.10	52	73.20
Dimenhydrinate	68	20.90	16	22.50
Diclofenac Sodium	64	19.60	18	25.40
Esomeprazole	62	19.00	8	11.30
Metronidazole	56	17.20	26	36.60
Insulin	52	16.00	9	12.70
Acetaminophen	52	16.00	27	38.00
Hydrocortisone sodium succinate	52	16.00	18	25.40
Acetyl salicylic acid	48	14.70	12	16.90
Lactulose	48	14.70	0	0.00
Renacid	44	13.50	2	2.80
Drotaverine	44	13.50	0	0.00
Ciprofloxacin	38	11.70	8	11.30
Losartan	38	11.70	0	0.00
Azithromycin	34	10.40	10	14.10
Levofloxacin	32	9.80	16	22.50
Furosemide	30	9.20	34	47.90
Tramadol	28	8.60	8	11.30
Domperidone	28	8.60	0	0.00
Vitamin k	24	7.40	0	0.00
Atorvastatin	20	6.10	12	16.90
Aspirin	20	6.10	0	0.00
Pregabalin	16	4.90	10	14.10
Quinine	16	4.90	1	1.40
Rosuvastatin	16	4.90	0	0.00
Metoclopramide	16	4.90	0	0.00
Iron Sucrose	16	4.90	10	14.10
Vitamin D	14	4.30	0	0.00
Dexamethasone	12	3.70	10	14.10
Imipenem/ Cilastatin	10	3.10	0	0.00
Ranitidine	10	3.10	0	0.00
Clarithromycin	8	2.50	0	0.00
Metformin	8	2.50	0	0.00
Ramipril	8	2.50	1	1.40
CO Amoxiclav	8	2.50	8	11.30
Rifaximin	8	2.50	0	0.00
Metoprolol Tartrate	8	2.50	0	0.00
Dopamine	8	2.50	0	0.00
Allopurinol	8	2.50	0	0.00
Hydroxyurea	8	2.50	0	0.00
Clopidogrel	8	2.50	0	0.00
Vit B complex	6	1.80	10	14.10
Digoxin	4	1.20	0	0.00
Amino Acid	4	1.20	0	0.00
Etizolam	4	1.20	0	0.00
Lisinopril	2	0.60	0	0.00
Ketorolac	0	0.00	10	14.10
Acyclovir	0	0.00	1	1.40
Montelukast	0	0.00	1	1.40
Nystatin	0	0.00	8	11.30

Cross Tabulation of treatment pattern with Cough is summarized in Table 10, In hospitalized elderly patients suffering from cough ceftriaxone was mostly prescribed (*n*=162, 90%), while omeprazole (130,72.2%), hydrocortisone sodium succinate (*n*=54,30%) acetyl salicylic acid (46, 25.6%) and azithromycin (*n*=44, 24.4%) were prescribed to hospitalized patients suffering from cough.

Cross Tabulation of treatment pattern with Compliance (Multiple Responses) is summarized in Table 11, Most of the hospitalized patients were complaint to ceftriaxone (*n*=240,73.6%), omeprazole (*n*=186, 57.1%), dimenhydrinate (*n*=68, 20.9%) and diclofenac sodium (*n*=64, 19.6%). Elderly hospitalized patients were non-complaint mostly to omeprazole (*n*=52, 73.2%), ceftriaxone (*n*=47, 66.2%), furosemide (*n*=34,47.9%) and acetaminophen (*n*=27, 38%).

DISCUSSION

Our study showed that 4.3% of hospital admission was due chronic obstructive pulmonary disease (COPD) unlike the study conducted by Nayaka *et al.* showed that 41% of hospital admission was due to COPD. Diabetes mellitus related hospital admission was 5.7% in our study while study conducted by Nayaka *et al.* showed 35.3% of admission from diabetes mellitus. Hypertension related hospital admission was 11.7% in our study while study conducted by Nayaka *et al.* showed 49% of admission from diabetes mellitus.[15]

In this study 36.8% of the patients were prescribed 4 drugs, 26.7 % of patients were prescribed 5 drugs and 8.3% of patients were prescribed 7 drugs for their diseases. most number of medications prescribed to the patient in this study was 9. Study conducted by Nayaka *et al.* resulted that less than 5 medications prescribed in 22.67% of hospitalized patients. While 5 to 10 medications were prescribed to 62% of patients.[15] The study conducted by Braga *et al.* showed that 58.9% of elderly patients were prescribed 5 drugs.[16] Study conducted by Sharma *et al.* resulted that average drugs prescribed to elderly patients were 5.[17] Christopher *et al.* resulted in 3.3 drugs prescribed per elderly patients.[18]

This study showed that 50.5% of medications prescribed to hospitalized patients were parenteral dosage form while no intravenous routes drugs were 49.5% prescribed. Study conducted by Nayaka *et al.* resulted that 26.38% of parenteral, 58.5% oral and 15% of other dosage forms were prescribed to hospitalized patients.[15]

In our study antacids that was frequently prescribed (12.4%) was omeprazole and esomeprazole (3.6%) while study conducted by Nayaka *et al.* resulted in 52% of antacid prescriptions where mostly prescribed antacid was pantoprazole[15] and the study conducted by Braga *et al.* resulted that ranitidine was most prescribed antacid.[16] Our study showed that ceftriaxone was prescribed to 14.9% of elderly patients while study conducted by Nayaka *et al.* resulted in 21.33% of elderly patients.

Our study showed that 82.1% of elderly patients were compliant with the medication while study conducted by Miller *et al.* resulted in compliance of 50% to their prescribed medications.[19] While study conducted by Ross *et al.* resulted in good compliance of 74.1%.[20]

The differences of values between our study and other studies that are mentioned above, since almost all the studies were conducted in different hospital specialty settings where different diseases affected patients reported.

CONCLUSION

This study concluded that the compliance to medication was 82.1% of elderly patients. Ceftriaxone was most prescribed drugs among elderly patients that were admitted in different specialty departments. Most of the elderly patients had uncontrolled disease status. Fever was chief complaint of hospitalized elderly patients.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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