Original article:

Drug utilization pattern in Geriatric patients admitted in the Medicine Department at Tertiary care Hospital

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Abstract:

Background: Geriatric population is rising rapidly due to advances in medicine, improved sanitation, improved lifestyles, better diets, and the increase in socio-economic growth. The objective of present study was to assess the drug utilization pattern among the geriatric patients in Tertiary Care Hospital of Kathmandu.

Methods: Total 300 prescriptions of patients' ≥ 65 years admitted in the medicine department of Kathmandu Medical College and Teaching Hospital, Kathmandu were studied from March 2017 to September 2017.Drug utilization pattern, commonly used drugs and WHO indicators were assessed and evaluated after taking ethical clearance from IRC.

Results: Out of 300 patients 217 were males and 83 were females. Average age of geriatric patients was 69.38 years. The numbers of patients having respiratory disorders were 23.81% followed by CVS disorders (20%), and endocrine system disorders (19.30%). Amlodipine was the most frequently prescribed drug followed by Salbutamol, Metformin and Losartan.

Conclusion: Irrational prescribing and polypharmacy were abundantly prevalent among elderly patients. The study on drug utilization pattern can help significantly in evaluating the quality of care given to the elderly patients and enhance rational use of medicines for their better health outcomes.

Keywords: Drug utilization pattern, WHO Essential medicine list, Polypharmacy

Introduction

Geriatric population is expected to rise rapidly due to advances in medical technology, improved sanitation, better diets, and the success of socio-economic growth, in the next few decades.[1] 60% of the world's elderly found in developing countries.[2] Drug use in the elderly compromises of many problems because of the following factors: the physiologic changes of aging and potential drug–drug and drug–disease interactions.[3] Polypharmacy and the inappropriate use of medicines have been identified as major types of nonrational prescribing leading to higher prevalence of adverse drug reactions among them.[4-5] These

factors have also been shown to be responsible for a disproportionately high rate of adverse drug reactions and its associated increased healthcare costs.[6-7] The prevalence of adverse reactions increased in the older people and reactions are reported to be more severe.[8] Studies on hospitalization due to adverse drug reactions reveal that elderly are several times more likely to be admitted and about half of these reactions are preventable.[9]Elderly people consume more medicines than the general population. The use of drugs in elderly patients is almost higher by a factor of three compared to non-elderly population.[10] the higher incidence of chronic diseases and

degenerative pathologies increases demand for prescription medicines. Aging related pathophysiologic changes also make them more prone to medication error. The resulting altered pharmacokinetics and pharmacodynamics due to these changes, makes them more susceptible to the adverse effects of drugs.[11]

Manufacturers do not include elderly in the clinical trials prior to marketing drugs which is the major drawbacks regarding use of medicine.[12] Prescribing too many medications to the elderly leads to lack of medication adherence and results in ineffective treatment.[13]The altered physiology during aging and existence of multiple diseased states makes this population vulnerable that causes significant morbidity and mortality.[14]Health care providers needs to implement use of necessary and safe medicines in order to control misuse and polypharmacy .[15]

This study will provide the information regarding useful planning of geriatric health services. Factors associated with increased drug use will also be identified, so that those who are at high risks could be identified and preventive measures can be applied.

MATERIALS AND METHODOLOGY:-

The prospective cross-sectional study involving 300 patient based on non-probability sampling was conducted in the Department of Internal Medicine of tertiary care hospital from March 2017 to September 2017 after obtaining ethical clearance from Institutional Review committee (IRC). The study was carried out among geriatric patients admitted in the department of Internal Medicine at tertiary care hospital who were prescribed medicine during their hospital stay. Data was recorded in customized proforma from the in-patient daily record sheets and reports. Medical and nursing records were analyzed for patient characteristics (e.g. age, gender and number of days of hospital stay), number of Medicine for each patient, generic or trade names, common diseases prevalence and common medication prescribed to these patients. SPSS package version 20 was used for analysis.
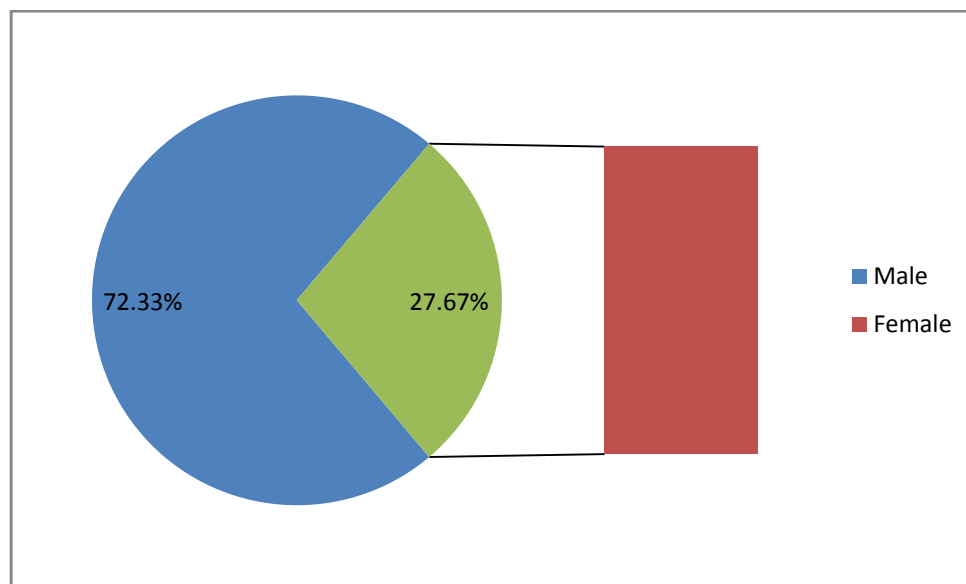
Figure 1: Gender distribution among study populations

Table 2: Age wise distribution of the study populations (N=300).

Serial No	Age	No. of prescriptions	Percentage (%)
1	65-70	161	53.66
2	71-75	76	25.33
3	76-80	40	13.33
4	80 and above	23	07.68

Table 3: Distribution of drugs prescribed among study population (N=300)

Category of Drugs and Disease	No of drugs (2150)	Percentage
Drugs prescribed for Respiratory system	512	23.81 %
Drugs prescribed for CVS	430	20.00%
Drugs prescribed for CNS	118	05.48%
Drugs prescribed for Endocrine system	415	19.30%
Drugs prescribed for G.I.T	218	10.13%
Prescribed Vitamins, minerals & dietary supplements	111	5.16%
Prescribed Antimicrobials	225	10.46%
Prescribed Analgesics	121	05.66%

Table :4

Number of Drugs per prescription

S. N.	No. of drugs per prescription	No. of patients	percentage
1.	5 drugs	53	17.66%
2.	5-8 drugs	140	46.66%
3.	>8 drugs	107	35.68%

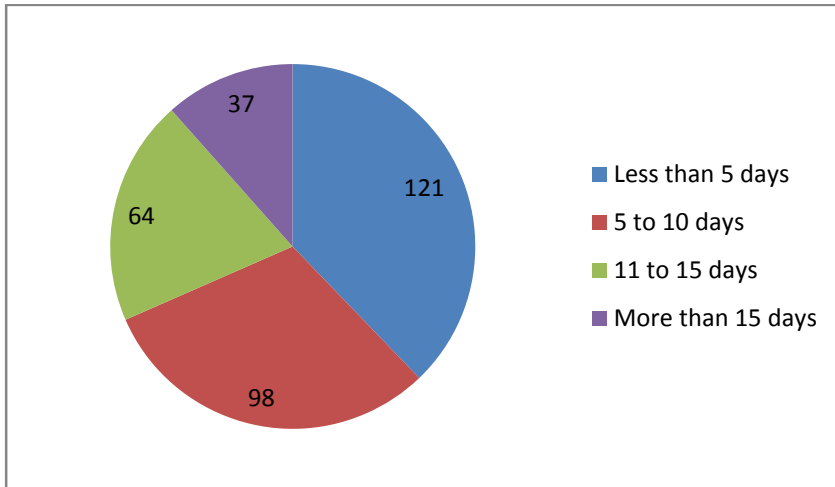**Figure 2: Duration of hospital stay among study population (N=300)**

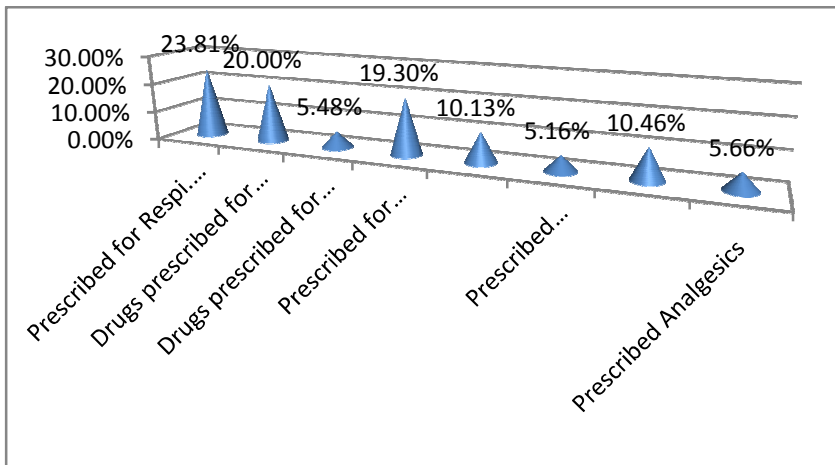**Figure 3: Distribution of drugs prescribed among study population (N=300)**

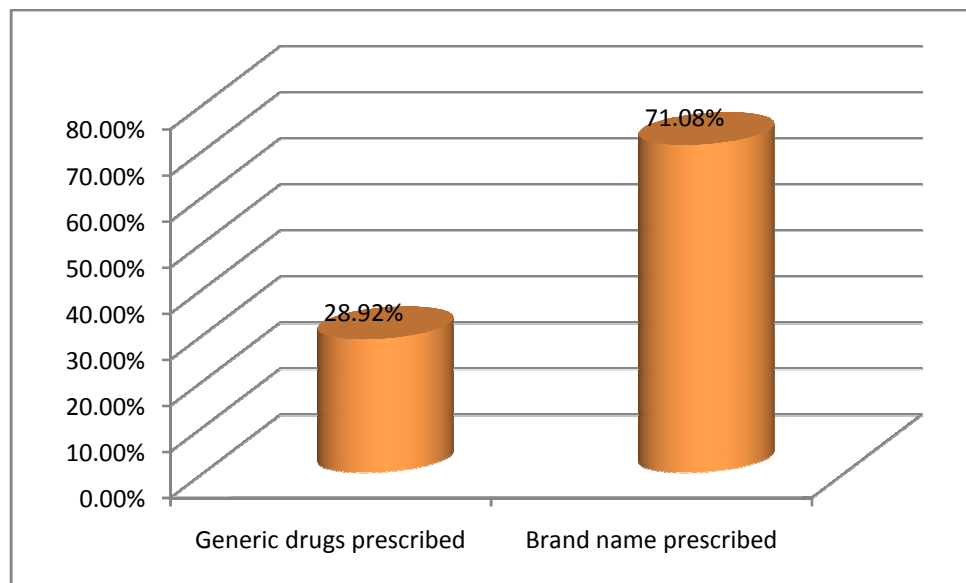**Figure 4: Distribution of prescribed drugs (Generic Vs Brand name)**

Table: 4 category of Disease and most commonly used Drugs for therapeutic use.

Category of Disease and therapeutic use of Drugs	Most commonly prescribed Drugs	Total no prescribed
Drugs prescribed for Respiratory system	Salbutamol	135
	Ipratropium bromide	086
	Cetrizine	054
Drugs prescribed for CVS	Amlodipine	147
	Losartan	097
	Atenolol	064
Drugs prescribed for CNS	Lorazemap	042
	Amytriptiline	027
	phenytoin	018
Drugs prescribed for Endocrine and renal system	Metformin	116
	Insulin	082
	Furosemide	058
Drugs prescribed for G.I.T. system	Ranitidine	072
	Pantoprazole	063
	Digestive enzymes	035
Drugs prescribed as vitamins, minerals, dietary supplement	Vit B complex	037
	Folic acid	024
	Calcium	017

Drugs prescribed as **Antimicrobials**	Ceftriaxone	082
	Amoxicillin	055
	Metronidazole	033
Drugs prescribed as **Analgesics**	Ibuprofen	052
	Nimesulide,	027
	Paracetamol	022

RESULTS

A total of 300 elderly patients fulfilled the inclusion criteria, Total 217 male and 83 female were included in the study. The gender distribution of the elderly in which 217 (72.33%) were males and 83(27.67%) were females. The average age was 69.38 years in which maximum number of patients were of age group 65-70 (53.66%), followed by 76(25.33%) were of age group 71-75 similarly 40(13.33%) were of age group 76-80 and 23(7.68%) were of age group more than 80 years.Table 3 shows the total number of drugs prescribed based on diagnosis of diseases. It was found that highest number 512(23.81%)of the drugs from total 2150 has been prescribed to patient suffering from respiratory diseases similarly 430(20%) drugs were prescribed to the patient suffering from cardiovascular diseases followed by415(19.30%) suffering from endrocrine and renal diseases.118(5.48%)of the patients were prescribed for central nervous system diseases. The average number of drugs prescription was 7.16 per patient. Similarly 53(17.66%)of patient were prescribed with 5 drugs followed by 140(46.66%)were prescribed with 5-8 drugs and 107(35.68%) were prescribed with more than 8 drugs. 40.33% of the patients were hospitalized for less than 5 days, whereas 32.66% of the patients were hospitalized for less than 10 days and 13.86% of the patients were hospitalized for less than 15 days followed by 12.33% of patients who were hospitalized for more than 15 days.Based on drug prescription 71.08% of the drugs were prescribed on brand name whereas only 28.92 % of the drugs were prescribed on generic name.Based on diagnosis and therapeutic purpose among the respiratory diseases maximum number of drugs were prescribed for chronic obstructive pulmonary disease followed by bronchial asthma and allergic rhinitis, in which salbutamol (135) has been prescribed followed by ipratropium bromide (86) and cetrizine (54).Similarly, in case of cardiovascular disease hypertension was the most common disease in which calcium channel blockers amlodipine(147) were prescribed followed by losartan (97)and beta blockers atenolol(64).Among the drugs prescribed on CNS diseases insomnia followed by anxiety and epilepsy were   the common disease in which lorazepam, amytriptiline and phenytoin were prescribed. In renal and endocrine system Diabetes mellitus and urinary obstructions were the most common diseases in which metformin (116)and insulin(82) followed by furosemide(58) were prescribed. Among the drugs related to gastrointestinal system drugs for gastroenteritis and anti ulcer drugs ranitidine and pantoprazole were prescribed followed by digestive enzymes. On the basis of vitamins, minerals and dietary supplements vitamin b complex, folic acid and calcium were prescribed more commonly.Based on infectious diseases typhoid fever, septicaemia and

respiratory tract infections were common diseases in which ceftriaxone (82) followed by amoxicillin (55) and Metronidazole (33) was prescribed.In case of analgesic agents ibuprofen (52) were prescribed followed by nimesulide (27) and paracetamol(22) were prescribed for headache , fever and lower backache which were common diseases.

DISCUSSION

The data was collected from 300 hospitalized patients using specially designed data collection form in which 217 (72.33%) were males and 83 (27.67%) were females. Majority of drug utilization in elderly was more common in males. The study revealed that majority of the patient were from the age group 65-70 years (53.66%)followed by 71-75 age group(25.33%) , 76-80 years with (13.33%) and more than 80 years by (7.68%). The average number of drugs per prescription is an important index in drug utilization pattern which is 7.16 in our study which shows poly pharmacy while it was 5.51 in Sharma et al[16] and 5 in another study conducted in Brazil[17] the reason for poly pharmacy is due to multiple diseases prevalence which has to be reduced in order to prevent adverse drugs effect, drug interaction, increased cost of medication and treatment as well as duration of hospital stay. Drugs prescribed by generic name was found to be 28% which is less than brand name 72% .whereas in other studies it was found to be 23% in Ghosh et al [18] which was less than our study and 53.6% in Joshi et al[19] of generic name which was high than our study, this finding state that we need to encourage prescription through generic name in our hospital and Medical college. The trend of using brand names was due to attraction on marketing policy which should be discouraged by the prescriber. Based on the disease prevalence and medication maximum number of drugs were prescribed to Patients suffering from respiratory tract diseases in which bronchial asthma , COPD, allergic rhinitis were common diseases were salbutamol, ipratropium bromide and cetrizine were prescribed. Among the drugs prescribed in CNS alprazolam, amytriptiline and phenytoin were most common for insomnia ,anxiety and seizure which was found to be 5.48% which was similar 5% with the study conducted in Hongkong[20] ,those drugs were commonly prescribed particularly to control the anxiety and insomnia which is more common in elderly patient due to multiple chronic diseases. Metformin, insulin and frusemide were the most common drugs prescribed for renal and endocrine diseases like Diabetes mellitus and urinary tract obstructions which was different than the other studies in which sulfonylureas was commonly prescribed.

In our study pantoprazole, ranitidine, multivitamins, were prescribed for gastroenteritis and peptic ulcer and as dietary supplements medication which was similar with the study observed by Shankar et al [21] to overcome the various adverse effects of multiple medication like antimicrobials ,analgesics elderly patient were prescribed with antiulcer and gastric inhibiting drugs.

The most commonly prescribed drugs in antimicrobials were ceftriaxone, amoxicillin and Metronidazole for enteric fever and respiratory tract infections which is similar with the other studies since the elderly patient are more vulnerable to opportunistic infections as well as due to decrease in immunity due to ageing they are susceptible for infections.[22]

In our study analgesics were also prescribed most commonly for the reason of lower back pain which is similar with the study done by Phillips et al[23.] Many

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elderly patients were found more vulnerable from lower back pain due to ageing of intervertebral discs.

CONCLUSION:

Polypharmacy and prolonged duration of hospital stay are prevalent among elderly patient in order to prevent multiple disorder and complications. There is deficient in studies regarding the diseases and drug therapy in elderly patient .This study has shown the pattern of various drugs utilization in most common diseases in elderly patient whish has helped to provide baseline data. This type of drug utilization study may help to improve the quality of health care as well as to prevent further complications in elderly patient.

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