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DRUG UTILIZATION STUDY IN GERIATRIC PATIENTS VISITING THE OUTPATIENT DEPARTMENT IN TERTIARY CARE RURAL HOSPITAL

Pharmacology

Mr Haresh A Desai Ph D scholar, Sumandeep Vidyapeeth, Assistant Professor, Department of Pharmacology, Parul Institute of Medical Science & Research, Limda, Vadodara, Gujarat

Dr Bhagya Manoj Sattigeri* Prof & Head, Department of Pharmacology,SBKS MI& RC, Sumandeep Vidyapeeth, Piparia, Vadodara, Gujarat. *Corresponding Author

ABSTRACT

Aim & Objective: The study aimed to evaluate the disease pattern, drugs used & the prescribing patterns to the geriatric patients at rural hospital.

Materials and Methods: A total of 300 patients were enrolled in the prospective, cross sectional study. The demographic details, drugs used condition for which the drugs were prescribed and other related factors; names by which they were prescribed, use of fixed dose combinations were recorded and subjected to analysis.

Observation and Results: Enrolled patients belonged to the age between 65 to 74 years, who presented with cardiovascular (21.22%) followed by musculoskeletal conditions (17.44%). Medicines were mostly prescribed by brand names 72.11%, Ranitidine was most frequently prescribed followed by Aceclofenac. About 20.35% were prescribes as FDCs for ex; Aceclofenac + Paracetamol was most commonly prescribed FDC followed by Amoxicillin + Clavulanic Acid.

Conclusion: Cautious use of medicines in geriatric patients is essential which can be provided by rational prescribing.

KEYWORDS

Geriatric patients, drug utilization pattern, Generic name prescribing, FDCs, outpatient department

INTRODUCTION:

Elderly population in the world is increasing rapidly with the growth rate of 1.9% which is higher than the growth rate of general population (1.2%) [1]. Geriatric patients are very often exposed to the practice of polypharmacy due to the comorbid conditions they suffer. Compromised health condition, exposure to polypharmacy and irrational use of drugs makes them succumb to the drug interactions and adverse drug reactions. Studies in developed countries showed that consumption of medication increases with age and that many elderly use at least three prescribed drugs concurrently [2,3]. In developing countries, the proportion of elderly using at least more than one medication daily ranges from 85% to 90% [4-7]. This makes them more vulnerable for drug-drug interactions and subsequently adverse drug reactions (ADRs). Elderly patients are reported to be consumers of half the total drugs prescribed [8]. Physiological changes that occur with the aging process that greatly influence the pharmacokinetics and pharmacodynamics aspects of the drugs, making it essential to closely monitor the drug effects which may greatly prevent the ADRs and drug interactions [9].

Drug utilization study has been defined by the World Health Organization (WHO) in 1977 as "study of marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences [10]." Drug utilization study may provide insights into different aspects of drug use and drug prescribing, such as pattern of drug use, quality of use, determinants of use, and outcome of drug use. Various researchers have studied geriatric drug utilization patterns but very few studies on drug utilization in geriatric patients have been carried out in Indian set up. Hence, the present study was undertaken with the broad aim of understanding the pattern of drug use in geriatric patients and prevent the practice of irrational use of medications, occurrence of drug interactions and adverse drug reactions.

METHODOLOGY:

The prospective, cross-sectional, observational study was carried out at Out Patient Department of Dhiraj Hospital, Sumandeep Vidyapeeth, Vadodara during, May-2015 to April-2016 to observe the drug utilization pattern in geriatric population.

A total of 300 geriatric patients of either gender who visited various outpatients department of Dhiraj Hospital, Sumandeep Vidyapeeth during the study duration were enrolled serially after they were explained about study in detail, in the language they understood, in the presence of his/her Legally Authorized Representative (LAR). The study was initiated after the approval of the Institutional Ethics Committee and after obtaining the informed consent.

The demographic details of the patient, the clinical condition for which he or she was treated, the details of the existing comorbid conditions, drugs used in the treatment (including dose, frequency, duration, combination, generic/branded, indication), prescribing pattern, etc. were recorded in the case record form. The collected data was then subjected to analyze the number of drugs prescribed, average number of drugs per prescription, use of fixed dose combinations (FDC), whether drugs were included in WHO-Essential Medicines List (WHO-EML), category wise distribution of drugs, route of administration of drugs. Analysis was carried out by using Microsoft Excel 2010. Data were represented as actual frequencies, percentage, and mean as appropriate.

OBSERVATIONS & RESULTS:

Of the enrolled patients two third of them belonged to the age between 65 to 70 years while, the remaining one third were above 70 years. It was observed that there were more male patients (62%) than the female patients (38%) as indicated in table no 1.

Table 1: Indicates age and gender wise distribution of enrolled participants (n=300)

Age Group	Male	%	Female	%	Total
65 to 70 Years	124	62.00%	76	38.00	200
71 to 75 Years	53	66.25%	27	33.75	80
> 75 Years	9	45.00%	11	55.00	20
Total	186	62.00%	114	38.00	300

Majority of the patients 24.33 % had cardiovascular disease followed by 20% had musculoskeletal conditions whereas 11.67% had endocrine related disorder, 07.33% had ocular diseases and 10% had respiratory disease as indicated in table no 2.

Table 2: Indicates the disease distribution among enrolled patients.

S no	Disease conditions	N	%
1	Cardiovascular disease	73	24.33%
2	Musculoskeletal Condition	60	20.00%
3	Endocrine Disorder	35	11.67%
4	Respiratory disease	30	10.00%
5	Ocular disease	22	07.33%
6	Gastrointestinal disease	20	06.67%
7	Genitourinary disease	21	07.00%
8	Viral Fever	09	03.00%
9	Liver related disease	10	03.33%
10	Dermatological disease	8	02.67%
11	Neurological disorder	6	02.00%
12	Psychiatric disorder	5	01.67%
13	Surgical condition	1	00.33%
	Total	**300**	**100.00%**

A total of 1776 drugs were prescribed for the patients, giving an average of 2.96 drugs per patient (range 1 to 8). Almost 34.17% patients were prescribed by 2 drugs whereas three drugs were prescribed to 31.50% of the patients, 13.33% patients had four drugs, 10.83% of the patients had five drugs, 6.83% had six drugs, 2.50% had seven drugs and 0.83% had eight drugs which clearly indicated the practice of poly pharmacy. Out of all drugs prescribed 27.89% were generic and 72.11% were branded. However, it was found that 97.89% of the prescribed medications were for oral administration, 20.35% of prescribed drugs were in the form of FDCs as indicated in table no 3.

Table 3: Indicates drug prescribing indicators.

S no	Indicators	%
1	Average number of drugs per prescription	02.96%
2	Generic Drugs	27.89%
3	Branded Drugs	72.11%
4	Drugs from essential drug list	75.65%
5	Drug prescribed by oral route	97.89%
6	FDCs	20.35%

Most commonly prescribed medicines included Ranitidine followed by Aceclofenac (37 cases), Pantoprazole (34 cases), Metformin (30 cases), Clopidogrel (30 cases), Calcium (30 cases), Methylcobalamine (24 cases), Amlodipine (20 cases), Aspirin (19 cases), Atorvastatin (13 cases) as shown in table 4.

Table 4: Indicates ten most frequently prescribed drugs in the enrolled participants

S no	Drug	No of Prescription
1	Ranitidine	46
2	Aceclofenac	37
3	Pantoprazole	34
4	Metformin	30
5	Clopidogrel	30
6	Calcium	30
7	Methylcobalamine	24
8	Amlodipine	20
9	Aspirin	19
10	Atorvastatin	13

It was observed that in a total of 122 patients the medicines were prescribed as Fixed dose combinations (FDCs). The most commonly used preparations included Aceclofenac + Paracetamol in 37 patients, followed by Amoxicillin + Clavulanic Acid in 15 patients, Clopidogrel + Aspirin were prescribed to 10 patients, Montelukast + Levocetrizine were prescribed to 6 patients, Salmeterol + Fluticasone MDI prescribed to 5 patients, Ibuprofen + Paracetamol were prescribed to 5 patients, Metformin + Glimepiride were prescribed to 4 patients, Levocetrizine + Phenylephrine + Paracetamol were prescribed to 2 patients as indicated in table 5.

Table 5: Indicates the commonly used Fix Dose Combinations in the enrolled patients

S no	Fix Dose Combination Drugs	No of Cases
1	Aceclofenac + Paracetamol	37
2	Amoxicillin + Clavulanic Acid	15
3	Clopidogrel + Aspirin	10
4	Montelukast + Levocetrizine	6
5	Salmeterol + Fluticasone MDI	5
6	Ibuprofen + Paracetamol	5
7	Metformin + Glimepiride	4
8	Levocetrizine + Phenylephrine + Paracetamol	2

DISCUSSION:

Advanced health care facilities have led to an increase in the life expectancy of Elderly population not just in India but all over the world. The vulnerable population, with advancing age has the physiological changes occurring that makes them different from a normal adult also the morbidity pattern is unique to elderly population. Hence, they are challenge to the treating physician.

To the best of our knowledge literature related to drug utilization pattern and related issues in elderly patients is limited in India, particularly in Gujarat. The present study was conducted with aim and objective of evaluating drug utilization pattern in geriatric population and practical problems faced during therapeutic interventions in elderly patients in a rural based tertiary care teaching hospital. In the defined study duration, a required data was collected and analyzed to explore the problems in elderly patients using different parameters.

After analyzing demographic data, it is observed that more number of male patients was affected with illnesses as compared to the female patients, thus indicating that the men are more vulnerable for the comorbid situations. This observation of ours is just opposite to the observations made by the researchers in a Japanese based study [11]which shows the predominance in female patients (74.7%) as compared to the male patients (25.3 %). Considering the age factor, in our study it was observed that more number of patients belonged to the age group of 65-74 years while the Japanese based studies (2005) it was observed to be more common in patients in age group of > 85 years which shows a major demographic differences in the patients, which can be attributed to the life span of individuals in Japan being more as compared to Indian (around 69). [11]

In the present study we have observed typical morbidity pattern in India, where, we have found that Cardio-vascular system (CVS) was the most commonly affected system. Most common diseases in CVS were hypertension followed by coronary artery disease and congestive cardiac failure. The second most common system affected was musculoskeletal system, and the conditions included osteoarthritis and fractures due to falls. The psychiatric conditions were least frequently encountered during the study period in contrast to studies done in the western countries where Psychiatric conditions are among the common ones. [12] In India, we find that the geriatric patients with psychiatric illness are the most neglected and probably this could be the reason of less patients attending the psychiatric OPD thus low frequency of psychiatric diseases observed in present study.

It was observed that in the present study, average number of drugs prescribed per prescription was 2.96 as compared to 5 drugs per prescription reported by Weiss DP (2004). [13] A similar study by Shenoy et al (2006) in South India also reported an average of 5 drugs per prescription for elderly patients. [14] The existence of the comorbid conditions in the elderly, explains the number of drugs prescribed per patients. However, the study center being a teaching institute in which the treating physicians are exposed to repetitive educational interventions as part of routine training programs this might have contributed to lower number of average drugs per prescription.

A total of 72.11% of formulations were prescribed by their brand names as observed in our study, however, there are very few studies that have been conducted focusing on this aspect of drug prescribing. Mamun K et.al.,(2004) have reported that 38.85% of prescribing was done by generic name, which is higher than our setup. [15] Similarly, Shewade and Pradhan (1998) had reported that 43.9% of medicines were prescribed by generic name in prescriptions collected from a government teaching hospital in India which is also higher than our study. [16] Prescribing by brand names of medicines is obvious for private consultants, as drugs are marketed largely by their brand names. This suggests that there is a need for encouraging the practice of prescribing the medicines using their generic names, particularly in a hospital attached to a medical college where medical students are taught medicines by generic name and generic prescribing is emphasized.

All over the world, only official names of drugs are used in teaching medical institutions. In the medical textbooks, scientific and research journals, drugs are mentioned only by generic names. Further, only generic names are accepted for legal and administrative purposes. However, aggressive marketing practices adopted by commercial interests and faulty drug policy in India have forced the doctors to use brand names while prescribing the medicines. Commitment on the part of prescriber to prescribe drugs by generic names and political will on the part of legislative and administrative bodies to enforce drug production and prescribing only by generic names can certainly lead to decrease in irrational prescribing and increase in availability of essential drugs , thus ultimately promoting rational use of medicines at a cheaper cost.

We found that, Ranitidine was the most frequently prescribed preparation, followed by Aceclofenac. Though ranitidine was the most frequently prescribed drug, prevalence of gastrointestinal diseases indicating its use was very low in our study, this shows that Ranitidine might be prescribed prophylactically along with the Non-Steroidal

Anti Inflammatory Drugs (NSAIDs) induced ulcers. Prophylactic use of ranitidine is not needed with short-term NSAIDs therapy in patients without any history of ulcer disease. Interestingly a Brazilian studyhas also reported ranitidine as one of the most prescribed medicine despite of low prevalence of gastrointestinal conditions. This indicates that irrational use of ranitidine is a wide spread problem. According to a Brazilian study, the second most prevalent drug prescription among elderly was for ranitidine. [13]

We have observed in our study that a total of eight fixed dose combinations were prescribed to treat the patients. The commonly used preparations included Aceclofenac + Paracetamol, Amoxicillin + Clavulanic acid, Clopidogrel + Aspirin etc. However, of the eight preparations we found that few were irrational for example, Aceclofenac +Paracetamol, Ibuprofen +Paracetamol, etc.

This study has generated baseline data for geriatric drug utilization at our institute, with some of the limitations which include; the data collected, that was from only one institute, so population is relatively homogenous. Large studies involving heterogeneous populations are required for better interpretations. Follow up of all the outdoor patients was not possible. Different issues related to geriatric prescribing like polypharmacy, inappropriate prescribing and adverse drug events can be further analyzed in details but due to limited time period we were not able to do so. Despite these limitations, we believe that the strength of our data is such that it has revealed several important aspects of the geriatric pharmacology like pattern of geriatric morbidity, drug use and issues related with it, prescribing pattern etc., in our setup. After considering all these factors, it is evident that there should be prescribing guidelines especially for elderly patients for better health outcome and improvement in quality of life.

CONCLUSION:

With improved health facilities and scientific advances, average life span of human beings is increased world-wide. It is our responsibility to see that we add not only years in life, but we add quality in the added years. There is a strong and urgent need of developing prescribing guidelines for elderly patient in different conditions so as to curb the practice of irrational use of medications as individual preparation or in combination, reduce the practice of polypharmacy, reduce the chances of drug interactions and adverse drug reactions. The same must be implemented in all health/medical care setups. Geriatric population needs efficient and safe medical care, which can be provided only by rational prescribing and using medicines for them safely.

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