



DRUG UTILIZATION PATTERN AMONG GERIATRIC PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL

Pharmacology

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ABSTRACT

The present study was conducted with the aim to evaluate the drug utilization pattern among geriatric patients of a tertiary care teaching hospital. A cross sectional study was conducted on elderly patients admitted in departments of Medicine and Surgery in a tertiary care teaching hospital. All the prescriptions were evaluated using WHO prescribing indicators. Total 200 prescriptions were collected during the study period. Most of the patients were in the age group of 65-69 years (68.5%) with male preponderance. Surgical conditions were the most common cause requiring hospitalization. Total 2045 drugs were prescribed to study participants with average number of drugs per prescription as 10.23 ± 3.14 . Generic prescribing constituted 59.8% while antibiotics were prescribed in 15.5% of prescriptions. The total number of injections prescribed was 41.7% and drugs prescribed from WHO-EML constituted 41.5%. The present study highlights the significance of drug utilization studies in geriatric

KEYWORDS

Drug utilization, Geriatric, Prescriptions, Prescribing indicators

INTRODUCTION

Drug utilization research 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 and social and economic consequences."^{1,2} It provides insight into various facets of drug use and prescribing like pattern of drug use, quality of use, determinants of use and the possible outcomes.³ The main aim of drug utilization research is to promote rational and appropriate use of drugs at lowest possible dose and cost.⁴

Population ageing is regarded as the most discussed global phenomena in the present era. Countries with vast population like India have a large proportion of people aged 60 years or above. India is ageing much faster than expected and the geriatric population may constitute nearly 20 % of the total population by 2050. The demographic trends suggest that between the years 2000-2050, the Indian population in its 60s and above will increase by 326%, while those in the age group of 80 years and above will increase by 700%—the fastest growing group.⁵ Geriatrics is the branch of medicine which deals with clinical, preventive, remedial and social aspects of illness in the elderly. Since elderly are usually excluded from clinical trials, knowledge about the efficacy and safety of drugs remains obscure for this age group. They have limited regenerative abilities and are more prone to diseases as compared to adults.⁶ Studies have concluded that the elderly population which was about 550 million in the year 1996 is expected to double by the year 2025.⁷ Advances in medicine have contributed to the accelerated growth in the elderly population. Elderly people generally suffer from multiple disease conditions thereby increasing the risk of poly-pharmacy and resultant drug-drug interactions. Moreover, adverse drug reactions (ADR) in the elderly are most commonly caused by inappropriate prescribing practices.⁸

Ageing is associated with certain physiological changes which influence the pharmacokinetics and pharmacodynamics of drugs. It is essential to analyse drug effects, especially risk of adverse drug reactions and drug-drug interactions, with clinical outcome in geriatric patients.⁹

There is paucity of data on drug utilization in elderly population. Hence, the present study was undertaken to assess the drug utilization pattern in a tertiary care teaching hospital in North India to facilitate rationale, effective and safe use of drugs in order to improve the quality of health care given to geriatric age group.

METHODS

Study Design

This is a cross sectional study conducted on hospitalized patients for a period of about 7 months in Department of Medicine and Surgery in a tertiary care teaching hospital in Northern India. The patients were

explained about the study procedure and an informed consent was taken.

Sample size

Total 200 patients were included in the study. 100 patients were from department of Medicine and 100 patients from department of Surgery.

Inclusion Criteria

1. Patients willing to participate in the study
2. Hospitalized patients of either sex aged 65 years or more
3. Patients admitted in the department of Medicine and Surgery

Exclusion Criteria

1. Patients unwilling to participate in the study
2. Patients below 65 years of age
3. Patients admitted in intensive care unit
4. Patients visiting the outpatient department

The prescribing details from each prescription were recorded in a case study form. This included age, gender and diagnosis of patients. Rationality of prescriptions was analyzed using WHO prescribing indicators.¹⁰ This includes five indicators which are - average number of drugs per prescription, drugs prescribed by generic name, number of antibiotics prescribed, number of injections prescribed and drugs prescribed from essential medicines list (WHO Model List of Essential Medicines 20th List, March 2017)¹¹

Ethics

The study was undertaken after obtaining approval from the Institutional Ethics Committee.

Statistical Analysis

The collected data was recorded in Microsoft Office Excel 2010 worksheet. Descriptive statistics was applied to evaluate the collected data. The categorical data was presented as n (%) and quantitative data was presented as mean and standard deviation.

RESULTS

A total of 200 prescriptions of indoor patients were collected from department of Medicine and Surgery and assessed using WHO prescribing indicators.

Demographic Parameters

The demographic parameters show that majority of patients were males in the age group of 65–69 years as depicted in Table 1 and Table 2.

Table 1: Age Distribution

	Medicine (n=100)	Surgery (n=100)	Total (n=200)
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Age group (years)			
65 - 69	63	74	137 (68.5%)
70 - 74	16	9	25 (12.5%)
75 - 79	6	11	17 (8.5%)
≥80	15	6	21 (10.5%)
Mean age ± SD	69.52 ± 6.64	67.97 ± 5.61	68.75 ± 6.18

Table 2 – Gender Distribution

	Medicine (n=100)	Surgery (n=100)	Total (n=200)
Male	64	65	129 (64.5%)
Female	36	35	71 (35.5%)

The most common condition for admission was surgical conditions like cholelithiasis, haemorrhoids and inguinal hernia (32 %) followed by cardiovascular disorders like coronary artery disease and hypertension (20 %) as depicted in Table 3.

Table 3: Prevalence Of Disease Conditions Among Elderly Patients

Diagnosis	Medicine	Surgery	Frequency (%)
Surgical conditions	0	64	64 (32%)
Cardiovascular disorders	35	5	40 (20%)
Respiratory disorders	21	0	21 (10.5%)
Genitourinary disorders	2	14	16 (8%)
Miscellaneous	12	2	14 (7%)
Gastrointestinal disorders	6	5	11 (5.5%)
Renal disorders	7	4	11 (5.5%)
Endocrine disorders	9	0	9 (4.5%)
Neoplastic disorders	1	6	7 (3.5%)
Neurological disorders	3	0	3 (1.5%)
Dermatological disorders	2	0	2 (1%)
Musculoskeletal disorders	2	0	2 (1%)

Total 2045 drugs were prescribed to 200 geriatric patients admitted in department of Medicine and Surgery. The prescriptions were evaluated using WHO prescribing indicators as depicted in Table 4.

Table 4: WHO Prescribing Indicators

WHO Prescribing Indicators	Frequency
Average number of drugs per prescription	10.23 ± 3.14
Percentage of drugs prescribed by generic name	1224 (59.8%)
Total number of antibiotics prescribed	319 (15.5%)
Total number of injections prescribed	854 (41.7%)
Total number of drugs prescribed from WHO-EML	849 (41.5%)

DISCUSSION

The geriatric population is rising worldwide. There is paucity of literature on drug utilization in this population in India. The present study was conducted to evaluate drug utilization pattern in elderly patients vulnerable to a myriad of diseases and drug related issues.

In this study, the average age of patients was 68.75 ± 6.18 years as observed in a similar study conducted in Odisha showing average age as 65.48 ± 4.37 years. There was male preponderance (64.5 %) which is in accordance with a study conducted earlier where 60.42% of total patients were males.¹²

The most common condition for hospitalization was surgical conditions like cholelithiasis, haemorrhoids and inguinal hernia (32%) followed by cardiovascular disorders (20%). Respiratory disorders (10.5%) were the next most common clinical condition. Another similar study conducted earlier showed that majority of elderly patients were admitted due to cardiovascular disorders.^{13,14}

The prescriptions were analyzed for rationality by using WHO prescribing indicators. The average number of drugs per prescription was 10.23 ± 3.14 which showed polypharmacy. This finding is considerably higher than the standard value (1.6 – 1.8).¹⁵ This could be due to the fact that geriatric patients are more prone to multiple diseases. These findings are higher than the findings obtained in similar other studies conducted earlier.^{12,16,17,18}

It was observed that there is low prescribing of drugs by generic names (59.8%) as seen in similar other studies.⁶ However, the derived standard value suggests that 100% of the drugs should be prescribed by their generic names.¹⁵ In this study, the percentage of encounters in which an antibiotic was prescribed was 15.5% which is less than the

derived standard value (20.0 - 26.8).¹⁵ The results of this study are consistent with similar other studies conducted earlier.^{19,20,21}

The percentage of encounters with injection was 41.7% which is higher than the derived standard value (13.4 - 24.1).¹⁵ It was seen that 27.7% of injections were prescribed in department of medicine while 55.3% of injections were prescribed in department of surgery. The findings in the present study are quite low as compared to another study which concluded increased frequency of hospitalized patients (84.6%) receiving injections.⁶ The percentage of drugs prescribed by WHO-EML was 41.5% (35.1% of drugs were prescribed in medicine and 47.6% in surgery) which is low as compared to another study.²² These findings are quite low when compared with the derived standard value for this indicator which is 100%.¹⁵

CONCLUSION

The present study concluded that despite of recent advances in medicine, research done on the geriatric population tends to be very less. Since elderly patients usually suffer from multiple disorders and are on multiple drugs, there is a growing concern to monitor the trends of drug utilization in this age group so as to minimize the risk of adverse drug reactions and drug-drug interactions thus ensuring rational use of medicines.

REFERENCES

- World Health Organization WHO Introduction to Drug Utilization Research Geneva: World Health Organization, 2003. Available at <https://apps.who.int/iris/bitstream/handle/10665/42627/924156234X.pdf?sequence=1&isAllowed=y>. Last accessed on Oct 16, 2020
- Helena G. Drug utilization studies. *Arq Med* 2008;22 (2-3):69-74. <http://www.scielo.mec.pt/pdf/am/v22n2-3/22n2-3a06.pdf>
- Shah BR, Gajjar BM, Desai SV. Drug utilization pattern among geriatric patients assessed with the anatomical therapeutic chemical classification/defined daily dose system in a rural tertiary care teaching hospital. *Int J Nutr Pharmacol Neurol Dis* 2012; 2(3):258-65.
- Meena VK, Atray M, Agrawal A. Evaluation of drug utilization pattern in indoor patients of medicine department at tertiary care teaching hospital in southern rajasthan. *Int J Pharm Sci Res* 2015; 7(9): 3835-40.
- Demographic time bomb: Young India ageing much faster than expected. Available on <https://economictimes.indiatimes.com/news/politics-and-nation/demographic-time-bomb-young-india-ageing-much-faster-than-expected/articleshow/65382889.cms?from=mdr>. Last accessed on July 20, 2020
- Lalwani US, Pillai A, Piparva KG. Drug utilization pattern among geriatric patients in a tertiary care teaching hospital. *Int J Pharm Sci Res* 2017;8(3):1249-54.
- Momin TG, Pandya RN, Rana DA, Patel VJ. Use of potentially inappropriate medications in hospitalized elderly at a teaching hospital: A comparison between Beers 2003 and 2012 criteria. *Indian J Pharmacol* 2013;45(6):603-7.
- Abraham F, Varughese G, Mathew JC, John PM, Sam GK. Drug utilization pattern among geriatric patients in a tertiary care teaching hospital. *Asian J Pharm Clin Res* 2015;8(6):191-4.
- Dipiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, editors. *Pharmacotherapy: A pathophysiologic approach*. 7th ed. New York: McGraw Hill;2008 p57-66.
- How to investigate drug use in health facilities. Available on https://apps.who.int/iris/bitstream/handle/10665/60519/WHO_DAP_93.1.pdf. Last accessed on July 4, 2020
- WHO model list of essential medicines, 20th list (March 2017, amended August 2017). Available at <https://apps.who.int/iris/bitstream/handle/10665/273826/EML-20-eng.pdf?sequence=1&isAllowed=y>. Last accessed on July 20, 2020
- Pradhan S, Panda A, Mohanty M, Behera JP, Ramani YR, Pradhan PK. A study of the prevalence of potentially inappropriate medication in elderly in a tertiary care teaching hospital in the state of Odisha. *Int J Med Public Health* 2015;5(4):344-8.
- Kanagasanthosh K, Topno I, Aravindkumar B. Prevalence of potentially inappropriate medication use and drug utilization pattern in elderly patients: A prospective study from a tertiary care hospital. *Int J Res Med Sci* 2015;3(8):2062-72.
- Sharma N, Advani U, Kulshreshtha S, Parakh R, Bansal A, Sinha RR. Screening of prescriptions in geriatric population in a tertiary care teaching hospital in North India. *J Phytopharm* 2013;2(5):38-45.
- Isah AO, Ross DD, Quick J, Laing R, Mabadeje AFB. The development of standard values for the WHO drug use prescribing indicators. *ICUM/ EDM/WHO*. Available at http://archives.who.int/prduc2004/rduc/ICUM_Posters/1a2_txt.htm. Last accessed on Dec 24, 2020.
- Prasad SN, Revankar S, Vedavathi H, Chidanand KN, Murray JL, Manjunath H. A study on prescription analysis and utilization of antibiotics in geriatric in-patients admitted in Shimoga institute of medical sciences tertiary care hospital, Shimoga, Karnataka, India. *Int J Basic Clin Pharmacol* 2016;5(3):904-9.
- Nayaka SR, Rajeshwari B, Venkatadri TV. Drug utilization pattern in geriatric inpatients of medicine department in a Tertiary Care Teaching Hospital. *Int J Basic Clin Pharmacol* 2015;4(3):568-73.
- Lourd JA, Venkata NKP, Udhayalakshmi T, Jayapriya B, Maruti SS. Drug utilization patterns of geriatric patients admitted in medicine department of a tertiary care hospital. *Int J Pharm Life Sci* 2013; 4(11):3087-92.
- Kashyap M, D'Cruz S, Sachdeva A, Tiwari P. Drug Use Pattern among Indian elderly outpatients. *J Ind Acad Geriatrics* 2016;12:5-9.
- Venkateswaramurthy N, Hafiz Muhammed PM, Sambathkumar R. Drug utilization pattern among geriatric patients in a tertiary care teaching hospital. *American J pharmacy Health Res* 2014;2(12):211-8.
- Wandalkar P, Pandit PT And Ghongane BB. Study of prescribing pattern in elderly patients visiting medicine outpatient department at a tertiary care hospital. *Int J Pharm Bio Sci* 2015; 6(4): 168 – 77.
- Kolhe A, Kale AS, Padwal SL. Drug utilization study in geriatric patients at rural tertiary care hospital. *Asian J Pharm Clin Res* 2015;8(4): 90-2