

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Analysis of Drug Utilization Pattern in Elderly in An Outpatient Department Using Who Indicators: A Cross Sectional Study.

Supriya Pradhan*, Abinash Panda, and Snigdha Rani Panigrahy.

Department of Pharmacology, M.K.C.G. Medical College & Hospital, Berhampur, Odisha, India.

ABSTRACT

People above 65 years spend on average 1.5 times on healthcare facilities. The objective of the study was to determine the prescribing patterns among elderly visiting a tertiary care teaching hospital using WHO prescribing indicator in different outpatient departments. A hospital based cross-sectional study was carried out among elderly patients (age \geq 65 years) who were prescribed in the outpatient departments of tertiary care teaching hospital. Demographic data and data on prescribing pattern were collected in case record form. Three hundred-six prescriptions were collected from different outpatient departments out of which 204 (66.6%) were males and 102 (33.3%) were females. The total number of medications prescribed was 1749 while the average number of drugs per patients was 5.7. Eighteen percent of the medicines were prescribed in their generic names, 128(41.8%) of all the prescriptions had one or more antibiotics prescribed and a total of 138(45.1%) prescriptions had at least one injections, 32% of the drugs were prescribed from the WHO Essential Drug List and 35% of the drugs were prescribed from the National Essential Drug List. In our setup drug prescribing among the elderly is not adherence to WHO prescribing indicator. This can be associated with increased cost of healthcare and morbidity. Therefore, appropriate interventions are required from all stakeholders.

Keywords: Drug utilization, WHO prescribing indicator, elderly, rational use of medicine

**Corresponding author*

INTRODUCTION

Rational use of medicine is essential in elderly patients as it can improve the quality of life and prolong the life span. In 1985, World Health Organization (WHO) initiated the concept of rational use of medicine (RMU) to improve the use of medicines, especially in developing countries [1]. Subsequently, it formulated a set of indicators and appropriate methodology to evaluate the trends in prescribing, drug use patterns and dispensing behaviour in different healthcare setups. In spite of all, the inappropriate prescribing is widespread [2]. Prevalence of the drug use increased in elderly populations as incidence of multiple chronic diseases and degenerative conditions increases [3]. There is a tendency to prescribe heavily for older patients. Age related physio-pathologic changes also alter pharmacokinetics and pharmacodynamics profiles of drug and make them more predisposed to adverse effects of drugs [4]. Thus, elderly people are susceptible to the danger of drug-related adverse effects along with drug-drug interactions, decreased dosing compliance because of poly-pharmacy which may render a sub-therapeutic effect, increased hospital stay and all these conditions leads to increased financial burdens [5]. The age distributions of populations have changed dramatically and changing continuously. According to United Nations Population Division, in less than four decades between 2012 and 2050, [6] the world population age 60 and older will more than double to 2.03 billion, and in India, the elderly population is expected to increase from 5% to 14%, while the population of 80 and older will be threefold and reach around 323 million [7]. Physicians need to understand aging biology along with WHO prescribing guidelines and how to use medicines rationally, in order to provide better health care facility to manage people who are elderly [8]. Therefore, the study was carried out to obtaining knowledge about the prescribing pattern in elderly in the southern part of Odisha using WHO core prescribing indicators, which is essential for providing optimal healthcare to this vulnerable population.

MATERIAL AND METHODS

Study design

This was a hospital based cross-sectional study, carried out in outpatient clinics of MKCG Medical College & Hospital during July 2015 to December 2015. This hospital is a 1000-bed facility and serves as a referral centre. The study protocol was approved by Institutional Ethics Committee. Sample size and sampling frame: "How to investigate drug use in health facilities selected drug use indicators" published by WHO suggests a sample size of at least 100 cases per health facility should be drawn and per facility 30 or more samples should be drawn for reliability. We enrolled total of 306 consecutive new patients (coming for the first time with the chief complaint) of both the sexes aged 65 yrs. or above, reporting to 10 different OPD of General medicine, Surgery, Gynecology, Orthopedics, Psychiatry, Skin, pulmonary medicine, Ophthalmology, ENT and Dentistry, as a special geriatrics department do not exist and majority of elderly patients attends these departments. All the patients participating were explained clearly about the study. Written informed consent was waived, as it was an observational study without having concern with patients and any intervention (however, verbal consent was taken). Patients attending the OPDs for treatment of chronic conditions, unwilling to participate, unable to communicate or seriously ill were excluded from the study.

Data collection

Data collection was done in a structured case record form (CRF) which included patient's demographic details (age, sex, socio-economic status), patient enrolment number, diagnosis or provisional diagnosis, and complete prescription. Calculating prescribing Indicators: WHO prescriber indicator form was used to collect data regarding to evaluate the criteria's of prescribing indicators such as average number of drugs per prescription, percentage of drugs prescribed by generic name, percentage of prescriptions with antimicrobial(s) prescribed, percentage of prescriptions prescribed with injection(s), and percentage of drugs prescribed from essential drug list/ National Essential Drug List NLME [9, 10].

Statistical Analysis

Data obtained were compiled and analysed with the help of Microsoft Excel 2013. The baseline descriptive data were analyzed and expressed as Mean \pm Standard Error (M \pm SE).

RESULTS

Patient characteristics

Data were collected prospectively from 306 consecutive patients during the study period, of which 204 (66.6%) were males and 102 (33.3%) were females. The mean age of the patients was 71years, which ranges from 65 years to 85 years. 249 (81.3%) patients were in the age group of 65-74 years and 56 (18.7%) were aged 75 years or above (table-1). Most of the patients presented with an acute medical problem on a background of chronic illness. Cardiovascular disorders (31.3%) is the most common conditions affecting the elderly patients visiting OPD, followed by infectious diseases like malaria, pneumonia etc. (19.6%).

Table-1: Distribution of patients according to demographic variables

Variables		Population	%
Gender	Males	204	66.7
	Females	102	33.3
Age	65-74 year	249	81.4
	75 years or above	56	18.3
Co-morbidity	1-2	234	76.47
	≥ 3	72	23.53

N=306

General Prescribing Pattern

A total of 1749 medications was prescribed during the study period. Among them, 315(18.01%) drugs were prescribed in their generic names and the rest 1434(81.9%) were prescribed in their brand names. The average number of drugs per patients was 5.7 (range from 1 to 10). The morbidity patterns of the patients were shown in table 2. Most of the patients presented with an acute medical problem on a background of chronic disorders. Cardiovascular disorders (31.3%) is the most common conditions affecting the elderly patients visiting OPD, followed by infectious diseases like malaria, pneumonia etc. (19.6%). Diabetes mellitus (13.7%) was a common condition for attending OPD followed by CNS disorders (11.7%), respiratory disorders (9.8%), liver diseases (4%), renal diseases (5.8%) and gastrointestinal disorders (4%).

Table-2: Associate co-morbid conditions

Disorders	Population	%
Cardiovascular disorders	96	31.37
Alimentary tract and metabolism	66	21.57
Infectious & inflammatory diseases	50	16.34
CNS disorders	45	14.71
Respiratory disorders	9	2.94
Kidney & Urinary-tract disorders	10	3.27
Miscellaneous	30	9.80

Drug characteristics by Anatomical Therapeutic Chemical

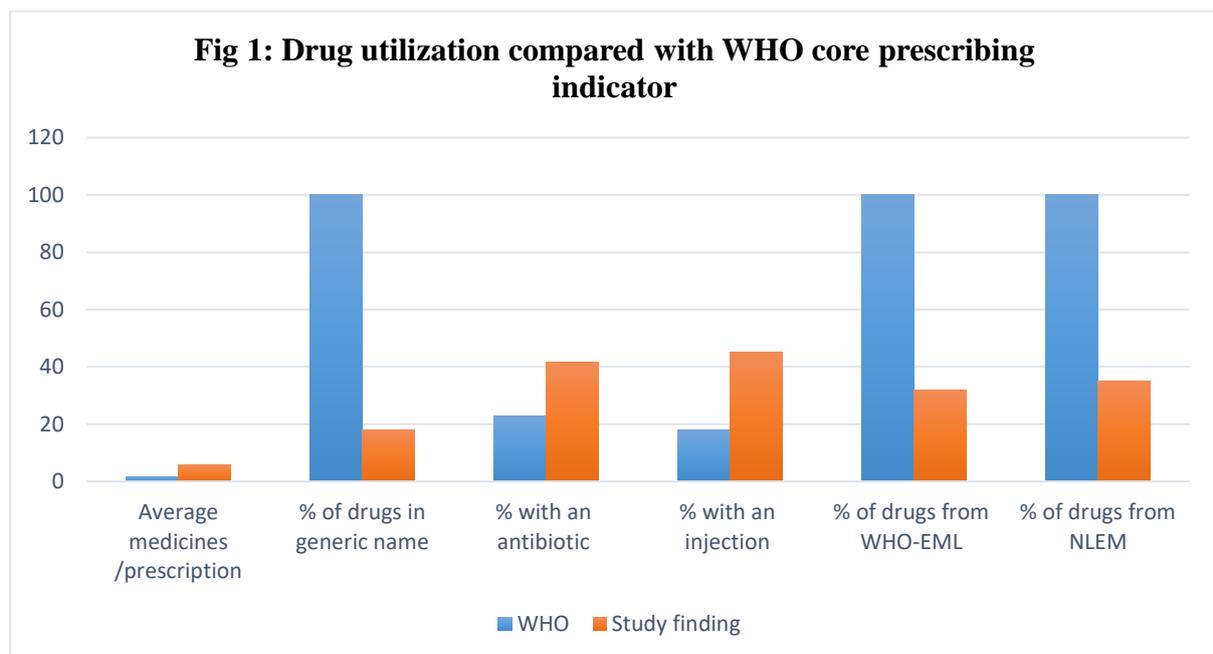
Drugs prescribed to these patients were coded into various drug classes according to Anatomical Therapeutic Chemical (ATC) classification based on WHO-ATC Index 2015, in two groups according to the organ/system on which they act or according to their chemical, pharmacological and therapeutic properties (Table-3) [11].

Table-3: Distribution of commonly prescribed drugs according to WHO-ATC classification

Drug	WHO ATC code	Number of prescriptions (%)
Lorazepam	N05BA06	61 (18)
Dexchlorpheniramine	R06AB02	59 (17.5)
Alprazolam	N05BA12	58 (17)
Dicyclomine	A03AA07	41 (12)
Amitriptyline	N06AA09	20 (6)
Nitrofurantoin	J01XE01	17 (5)
Nifedipine	C08CA05	10 (3)
Digoxin	C01AA05	31 (9)
Doxazosin	C02CA04	26 (7.5)
Diclofenac	M01AB05	8 (2.5)

WHO prescribing indicators

Medication usage is analysed comparing that with WHO prescribing indicators and presented in Fig-1. The average number of medicines per prescription was found to be 5.72, 18% of the medicines were prescribed in their generic names, 128(41.8%) of all the prescriptions had one or more antibiotic prescribed and a total of 138(45.1%) prescriptions had at least one injection, 32% of the drugs were prescribed from the WHO Essential Drug List and 35% of the drugs were prescribed from the National Essential Drug List.



DISCUSSION

In this study, trained data collector conducted 306 interviews with the elderly patients in different OPDs using CRF and WHO prescribing indicator forms. Based on WHO prescribing indicators, most of the prescriptions encountered in this study were lacking of standard requirements, similar type of finding was observed in a tertiary hospital in Nigeria by Eze & Olowu et al [12]. The number of medicines per prescription was found to be higher than the recommended range of 1.6-1.8, which was 5.72 and 204 (66.7%) patients were prescribed 5 or more drugs (poly-pharmacy) in our study. Other studies reporting drug utilization by the elderly from different countries have shown a similar high incidence of poly-pharmacy [13, 14]. Inappropriate use of medication is directly proportional to poly-pharmacy [15]. Along with, it may result in problems such as patients taking more medicines than their body systems can handle and produce ADR, non-compliance to the treatment regimen, drug-drug interaction and therapeutic failure [16].

WHO recommends that all the drugs (100%) written on a prescription should be in the generic name, whereas, we observed only 18% of the medicines prescribed in their generic names. Prescription of medicines in their brand names often result in increased cost to the patient, which may in turn lead to non-compliance to the treatment. It is important that drugs should be prescribed in their generic names to avoid confusion [17]. This implies that the prescribers are not complying with this recommendation, although a majority of the drugs in essential drugs are listed in their generic names. Also generic prescribing has a dual responsibility of providing patient service as well as medical education in a teaching hospital, especially in a tertiary care teaching hospital [18].

As per WHO core drug use indicators, recommended range for prescribing antibiotics is 20 – 26% and for injections is 13.4 – 24.0 %; however, in our study, 128(41.8%) of all the prescriptions had one or more antibiotic prescribed and a total of 138(45.1%) prescriptions had at least one injection prescribed along with other drugs [19]. Antibiotics and injections, both, increase the cost of treatment and ADRs in patients and are very high in our setup (Figure: 1); similar high prevalence is seen in the study conducted by Bist A et al. [20]. Similarly, only 32% of the drugs were prescribed from the WHO Essential Drug List and 35% of the drugs were prescribed from the National Essential Drug List [21]. Health care providers should be aware of this and use of drugs of the essential drug list should be promoted for optimal use of limited financial resources, to have acceptable safety and to satisfy the health needs of the majority of the population.

The strengths of our study is, WHO prescribing indicators are used to study drug utilization pattern which is a powerful exploratory tool. These kind of studies helps healthcare managers to compare between the situations and also can use to measure different types of interventions also. They can be used to supervise health care settings to assess any problems in drug utilization and to correct these problems quickly and efficiently. Limitation of this study is that it is a cross sectional outpatient based study, where we can't get enough information about the drug utilization. Results of this study can't be generalized to all the elderly populations.

CONCLUSION

The incidence of several chronic illnesses in older population is a common occurrence worldwide leads to poly-pharmacy. Elderly individuals suffer physiological changes due to aging and make them more vulnerable to adverse events related to drug use, which may result in a many complications. It has been evidenced that poly-pharmacy significantly increases the risk of inappropriate medications, adverse drug events (ADEs) and multiple journey to hospitals and all these factors increases the cost of health care. People above 65 years spend on average 1.5 times on health care compared to those in the 60-64 age categories. However, prescribers have less awareness concerning the risks of drug utilization in this population. So, creating awareness as well as regular medication reviews, rationalization of medications and use of less medications in these patients is essential.

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