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Prescribing pattern of drugs in the geriatric patients in jazan province, KSA

Abstract

Inappropriate drug prescribing is a global problem affecting the healthcare system. This study was performed to assess the drug prescribing pattern in elderly persons as these are exposed to polypharmacy because of multiple chronic conditions. There are a lot of risk factors for polypharmacy which include age, sex, race, health status, educational level and a number of chronic diseases which generally come with increasing age. This study was carried out to find rational use of prescribed drugs in the diseases with respect to the elderly patients registered in General Hospital of Jazan, KSA and to also investigate polypharmacy. A prospective, cross-sectional study was carried out in hospitalized elderly patients(age, >65years) selected from the month of November 2012 to October 2013 which consists of: Drug prescription pattern as per Beer's criteria, Percentage of category of drugs prescribed as per WHO core indicator, Missing Item Prevalence. Among 1034 elderly patients, the average age of study patients was 72years. The diseases found during this study were, hypertension, GIT disorders, cardiovascular diseases, respiratory tract diseases, diabetes mellitus. The average number of diseases present is 4+1 and the average number of drugs overall was 7+1. Among systemic route, commonly prescribed therapeutic class of medications were antibacterials(70.5%) and among oral route, pantoprazole was the most commonly prescribed medication(61.2%). This study demonstrates the prescribing patterns of drugs and usage of drugs in the elderly patients in the Jazan region of Saudi Arabia.

Keywords: inappropriate drug prescribing, geriatric patients, prospective, cross-sectional study

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Hani Ahmed Sultan,[1] Khalid Yahya Sayegh,[1] Abdul Vahed Mohammad,[1] Syed Mamoon Hussain,[1] Jameel MY Sumaily,[2] Meetu Agarwal,[1] Yousra Nomier,[1] Nakul Gupta[1]

[1]Department of Pharmacology, Jazan University, Kingdom of Saudi Arabia

[2]Department of Pharmacy, Jazan General Hospital, Kingdom of Saudi Arabia

Correspondence: Nakul Gupta, Department of Pharmacology, College of Pharmacy, Jazan University, Jazan, Kingdom of Saudi Arabia, Email drnakulmgupta76@gmail.com

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Abbreviations: NSAIDs, non-steroidal anti-inflammatory drugs; WHO, world health organization; GIT, gastrointestinal tract; ADRs, adverse drug reactions

Introduction

Rational use of drugs is one of the major problems that public health providers and administrators face nowadays in many countries.[1] Therefore during the past few years the concept of rational drug use has been the theme of various international and national meetings. Various studies have been conducted in developing and developed countries during past few years regarding safe and effective use of drugs now show that irrational drug use is a global phenomenon and only few prescriptions justify rational drug use.[2,3] The general advancement in medicine and knowledge has contributed to the increase in life expectancy of the population, not only in Saudi Arabia but in all countries of the world. This has led the people to live longer and at the same time has led to an increase in risk of illness, diseases and injuries. Despite the fact that the number of elderly people in Saudi Arabia in 2007 is less than 3% as stated by Ministry of Health, but this percentage is expected to increase as a result of the improved economic status, health services coverage and decrease in mortality and morbidity rates. Ministry of health, Saudi Arabia annual reports indicate that the life expectancy of the Saudi population has increased sharply in the past few years and peaked 73.1years(men 72.1 and women 74.1years).[4]

It is well documented that safe and effective drug therapy is most possible only when patients are well informed about the medications and their use. All members of the healthcare team should practice rational drug therapy. The rational use of drugs requires that the patients receive medications to their clinical need in appropriate doses that meet their own individual requirement for an adequate period of time and at the lowest cost to them and their community as per defined by the World Health Organization. The five important criteria for rational drug use are:

a. Accurate diagnosis
b. Proper prescribing
c. Correct dispensing
d. Suitable packing
e. Patient adherence

The prescribers should make an accurate diagnosis and prescribe rationally and the pharmacist should ensure that effective form of the drug reaches the right patient in prescribed dosage and quantity, with clear instructions on its appropriate use. The pharmacists should have an easy access to complete and unbiased information on the drugs used and should undergo prerequisite programmes for Pharmacist training.[5,6] Factors such as patient age, multiple diseases and its severity, use of multiple medications, changes in pharmacokinetics and pharmacodynamics in elderly patients as compared to the age group 20-29years often result in increase in the incidence of drug toxicity and adverse drug reactions(ADRs).[7]

The identification of the quantity and type of prescribing problems are fundamental first steps in trying to improve the quality of prescribing and medication safety. These require that rational

drug prescribing be promoted and potentially dangerous prescribing patterns be detected quickly and discouraged. Much drug related morbidity in the elderly population may be avoidable as it is due to inappropriate prescribing.[8] By keeping all of these issues in mind a study was carried out in the city of Jazan to determine the possible irrational use of drugs and drug- drug interactions among the prescribed drugs in the elderly patients(>65years), using patients gender, age, encounters and the occurrence of some predefined inappropriate drug prescribing, according to Beer's criteria, interactions between commonly prescribed drugs and essential drug list of WHO. Jazan is situated on the eastern flank of the Red Sea and considered as one of the fastest growing cities in the Kingdom of Saudi Arabia, about 1000 km southwest of Riyadh.[9]

Materials and methods

This prospective cross sectional(descriptive) study was carried out in the Jazan General hospital in Jazan City. The study was designed to obtain information regarding the prescribing pattern of drugs by the medical prescribers for the elderly patients. Duration of study period was six months(November 2012 to April 2013). A total of 1034 patients file belonging to the hospitalized elderly patients (age >65years) were collected from the hospital pharmacy department located in the hospital. Data collection occurred once for each patient and drug parameters (name of drug, strength, frequency, duration together with starting and ending dates, dosage form and route of administration) were extracted from medical record files using data collection sheet.

The patients aging 65years or more were used in the study. Patient parameters (name, age, gender, diagnosis, co-morbid condition/s, medication history and duration of hospitalization), disease diagnosed and drugs prescribed to each patient were studied. Prescription of a single drug was counted as one, even if the same drug was prescribed in more than one instance during hospital stay. To evaluate the drug prescribing pattern WHO prescribing indicators and for potentially inappropriate drug prescription patterns Beer's criteria were assessed. The average number of medicines per patient was calculated by dividing the total number of drugs by the number of patients. Percentage patient with injections and percentage of patients with antibiotics were determined by dividing the number of times prescribed by the total number of patients respectively and finally multiplied by 100.

Results

The demographic characteristics of the geriatric patients are shown in Table 1. Out of 1034 prescriptions studied, 648(62.67%) belonged to males and the rest 386(37.33%) to female patients, giving a male to female ratio of 1:0.59. Most of the patients were in the age group of 65-70years(57.83%) and least were in the more than 90years age group(1.45%) as shown in Figure 1. Based on Beers criteria 870(84.14%) patients received potentially appropriate prescriptions and 164(15.86%) were prescribed inappropriately. In the later case 126(34.62%) were of male patients & 38(10.44%) of female patients. This Study also reveals that patients in the age group of 65-70years received maximum percentage (48.17%) of inappropriate prescriptions, whereas the least percentage (3.66%%) of inappropriate prescriptions were found in the ≥90years age group as shown in the Table 2.

The average number of diseases present were 4+1 and the average number of drugs overall was 7.09. Among systemic route, commonly prescribed therapeutic class of medications were antibacterials (70.5%) and among oral route, pantoprazole was the most commonly prescribed medication(61.2%). In this study it was observed that a total number of 7336 drugs were prescribed to 1034 elderly patients. 1128(15.38%) drugs were acting on respiratory system, on GIT 1018(18.88%), as analgesics & anti-inflammatory drugs 948(12.92%), 884(12.05%) antimicrobial drugs, 739(10.07%) for cardiovascular diseases. A total of 643(8.76%) drugs were prescribed for diabetes mellitus, 520(7.09%) as antihypertensive drugs, 407(5.55%) antihistaminics, 348(4.74%) Vitamins, minerals & dietary supplements, 241(3.29%) for CNS disorders, 214(2.92%) for hematological system, 91(1.24%) antimalarial drugs, 43(0.59%) antitubecular drugs and 112(1.53%) were used for other diseases and disorders as shown in Table 3 and Figure 3.

Table 1 Gender distribution of elderly

Gender	No. of patients	Percentage
Male	648	62.67
Female	386	37.33

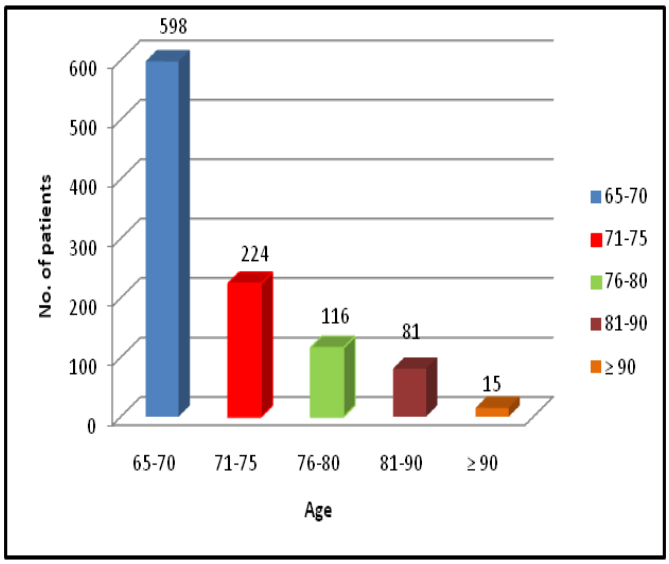

Figure 1 Age distribution of elderly patients.

Table 2 Age distribution of inappropriate prescriptions

No.	Age	No. of prescriptions	Percentage
1	65-70	79	48.17
2	71-75	38	23.17
3	76-80	22	13.42
4	81-90	19	11.59
5	≥90	6	3.66

According to the WHO core drug use indicator pattern average number of drugs prescribed per encounter was 7.09. Generic prescriptions were recorded with a very low figure of 7.24% which may not be in favor of the patients. Antibiotics were prescribed to 12.05%, while injections were prescribed to 28.45%. The percentage of drugs prescribed from national essential drugs list was 97.28% suggesting a good supply of the drugs in the hospital which is an

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impressive finding of the study as shown in Table 4. The study shows the prevalence of some missing items in the prescriptions. The major missing items were the Date of the consultation and Sex of the patient. In contrary almost all physicians mentioned frequency and duration of medication. Missing items included Family health record number (5.4%), Name of the patient (1.2%), Age of the patient (18.43%), Sex of the patient (22.12%), Nationality of the patient(2.4%), Name of physician (0.2%), Date of the consultation (25.54%) and diagnosis of the disease (18.3%) (Table 5). Frequency and duration of the medication are nil and 0.02% only which is an indicator of positive prescribing pattern.

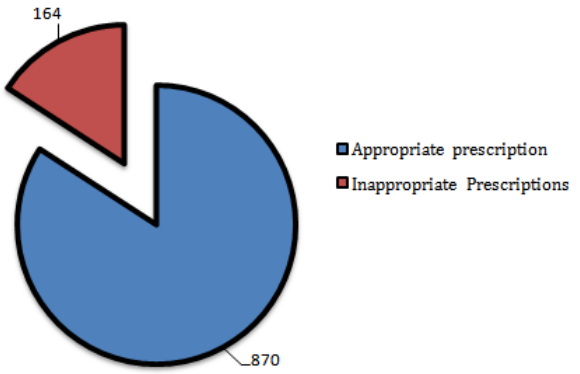

Figure 2 Inappropriate prescriptions as per beer's criteria.

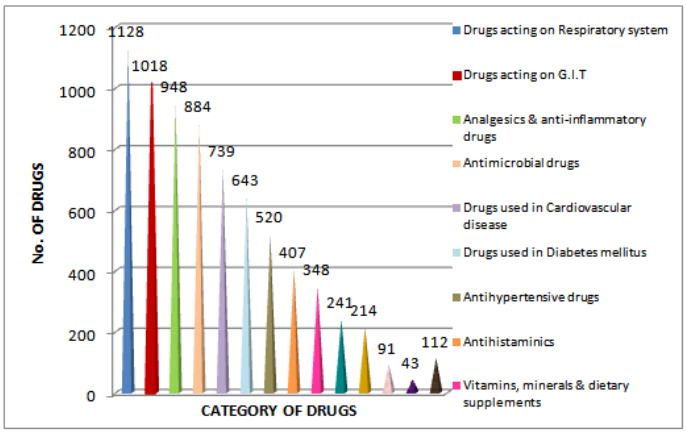

Figure 3 Category of drugs prescribed.

Table 3 Category of drugs prescribed

Category of drugs	No. of drugs	Percentage
Drugs acting on Respiratory system	1128	15.38
Drugs acting on G.I.T	1018	13.88
Analgesics & anti-inflammatory drugs	948	12.92
Antimicrobial drugs	884	12.05
Drugs used in Cardiovascular disease	739	10.07
Drugs used in Diabetes mellitus	643	8.76
Antihypertensive drugs	520	7.09
Antihistaminics	407	5.55
Vitamins, minerals & dietary supplements	348	4.74
Drugs used in CNS disorders	241	3.29
Drugs acting on hematological system	214	2.92
Antimalarial drugs	91	1.24
Antitubecular drugs	43	0.59
Others	112	1.53

Table 4 WHO core drug indicator for drug prescribing pattern

Prescribing indicators	Findings
Average number of drugs per encounter	7.09
Percentage of drugs prescribed by generic name	7.24%
Percentage of encounters with an antibiotic prescribed	12.05%
Percentage of encounters with an injection prescribed	28.45%
Percentage of drugs prescribed from national essential drugs list	97.28%

Table 5 Missing item prevalence

A. Identification of data	(%)
Family health record number	5.4
Name of the patient	1.2
Age of the patient	18.43
Sex of the patient	22.12
Nationality of the patient	2.4
Name of physician	0.2
Date of the consultation	25.54
B. diagnosis and medications	
Diagnosis	18.3
Frequency of medication	NIL
Duration of medication	0.02

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Discussion

There is no doubt that there is rapid ageing of population throughout the world. According to the 66th World Health Assembly organized by the WHO at Hague in May 2013, there would be an increase from 11% in 2000 to 22% in 2050 in the proportion of people aged over 60years. There seems to be a general scarcity of data and in Saudi as well in regards to utilization of drugs in the geriatric population. This study was undertaken with the goal of gaining an understanding of the drug utilization patterns in this study group. Use of five or more medications is considered as polypharmacy, which was observed in our study. The average number of drugs per elderly patient was found to be 7.09 which demonstrate high prevalence of polypharmacy 67.02%). Similar data was found in some other studies carried out by Joshi et al.,[10] in Nepal and Veena et al.,[11] in India where the incidence was 73% and 88.67% respectively. In this study, a total of 7336 drug formulations were prescribed to 1034 patients for different diseases. The rise in polypharmacy may be due to more literate elderly patients or their care takers. Polypharmacy cannot be deemed inappropriate as it is more important to evaluate its benefits in specific settings.

Inappropriate and high risk drugs should be avoided in the elderly as it effectively reduces the problems that are related to medicines as well as adverse drug effects. To evaluate the appropriateness prescribing for geriatric patients, Beers criteria was first developed in 1991 and was recently updated in 2012.[12] In the present study, according to Beers criteria, it was revealed that 15.6% of total drugs prescribed were inappropriate. These findings is not significantly different from that found in a study from India[13,14] & Japan[15] which observed use of at least one inappropriate medicine in 23.58%, 27.25% & 21.1%, prescriptions respectively. This suggests that drugs 'to be avoided in elderly' are among the most frequently inappropriately prescribed drugs. The morbidity pattern in these patients was quite similar to what is commonly found in Indian geriatric patients. The common morbidities included respiratory tract infections followed by GIT disorders. Our previous study[16] on the pediatric population of Jazan region also reported the highest incidence of respiratory tract infections. Higher incidence of these respiratory tract infections may be due the high percentage of airborne Amaranthus pollen in Jazan which potentially causes allergic respiratory diseases as reported by Hasnain et al.[17]

On the striking feature was that CNS disorders were not common (3.29%) which is in contrast to the data from the western countries. This may be due to the fact that most of the elderly people may be living with their family and were receiving proper family support and care, consequently avoiding these conditions. The most commonly prescribed medications in our study were drugs acting on the respiratory system (15.38%) followed by drugs acting on the GIT (13.88%). Pantaprazole (61.2%) was the most commonly prescribed medication. Pantaprazole was probably being prescribed for prophylaxis for NSAID induced gastritis. The Missing Item Prevalence in this study was 32.3% which was much less in comparison to 53% as reported by Sapkota et al.[18] The major omission was date of consultation which accounted for 25.54%. A positive outcome of this study was that the frequency of medication was not missing in any prescription and the duration of medication also recorded a mere 0.02%. However, it can be suggested that if all prescriptions are printed, the shortcomings in completing prescriptions can be easily avoided. Nevertheless, it is essential to make the prescriber, aware about appropriate/ inappropriate medications to be prescribed and encourage them to follow it strictly for better health care to geriatric population at all the level of health care.

Conclusion

In order to improve drug therapy for geriatric patients, it is very important for the prescribers to make themselves aware about the Beers criteria and that it should be strictly followed for better health care outcomes in the elderly. In conclusion, apart from providing very useful baseline data, this study also effectively demonstrates the prescribing patterns of drugs in the geriatric patients and the use of drugs among these patients in the Jazan region of Saudi Arabia.

Recommendations

Further studies on the inappropriate medications and their dose adjustments for the geriatric patients are the need of the hour to meet the increasing demand of quality. A key role can be played by the pharmacist to manage drug therapy in collaboration with prescribers which will be very effective in preventing the adverse drug reactions that may be resulting from inappropriate medications in geriatric patients.

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Conflict of interest

Author declares that there is no conflict of interest.

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