Polypharmacy and Geriatric Patients: Patterns of Prescribing in the Tribhuvan University Teaching Hospital in Nepal

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Abstract

Introduction	Polypharmacy is common occurrence in geriatric patients due to multiple illnesses.
Objectives	To analyze prescribing patterns in geriatric patients admitted in Tribhuvan University Teaching Hospital (TUTH), Maharajgunj, Kathmandu, Nepal.
Methods	Total of 3750 patients were admitted during a 1- year period from 1st July 2002 to 30th June 2003, out of which 546 patients (14.6%) were aged 65 and above. One hundred randomly selected records of geriatric patients admitted to the medical wards of TUTH during the study period was analyzed.
Results	The mean duration of hospital stay was 7.7 days. An average of 10.73 drugs was prescribed. The average number of drugs prescribed rises to 13.76 if individual components of the fixed dose product are calculated. The average number of drugs during discharge was 5.13. Intravenous fluids were the most frequently prescribed drugs. About one third (31.03%) of the drugs were prescribed by generic names. Eighty-nine percent of the patients received more than 5 drugs during hospital stay. Of the all drugs prescribed, 63.75% were prescribed from within the National List of Essential Drugs. About three-quarters (73%) were prescribed antibiotics and 72 percent of patients received drugs intravenously. Amoxycillin and Clavulanic acid combination product was most frequently prescribed antibiotic.
Conclusion	Major polypharmacy was common in the medical wards of the TUTH. This can misled us while calculating number of drugs prescribed to the patients if all the ingredients of the fixed dose combination products are not considered.
Keywords	Polypharmacy, Geriatric patients, Prescribing patterns, Teaching hospital.

Introduction

Polypharmacy is defined as the practice of prescribing four or more medications to the same person[1]. When the number of drugs prescribed totals five or more (major polypharmacy), a significant risk may be present[2]. Chronic illness increases with increasing age and elderly people are more likely to have conditions that require multiple drug treatment. The greater the number of drugs patient receives, the higher the chances of drug interactions. Due to physiological changes in the elderly, the pharmacokinetic and pharmacodynamics of the drug may be altered and may lead to adverse drug reactions, medication errors, longer duration of hospital stay and increased treatment cost. Aging, pre-existing diseases, dietary habits, smoking, alcoholism and increased use of drugs are all factors that contribute to the development of adverse drug reactions and medication errors. Therefore, formulating an optimum drug regimen that meets the complex need of elderly people requires careful and rational prescribing. In the present study, we attempt to describe trends of prescribing for geriatric patients in the medical wards of the 450-bed University based Teaching Hospital in Kathmandu, Nepal.

Materials and Methods

One hundred randomly selected records of geriatric patients (65 years and above) admitted to the medical wards of Tribhuvan University Teaching Hospital

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(TUTH) in Nepal during a 1-year period from 1st July 2002 to 30th June 2003 were analyzed.

Total of 3750 patients were admitted during the period in the medical wards of TUTH, out of which 546 patients (14.6%) were aged 65 and above. One hundred records of geriatric patients were randomly selected according to the random selection process described in WHO publication [3]. The number of sample selected for our study is based on the research article that at least 100 prescriptions should be analyzed in order to describe drug use pattern in the health care facility [4].

A data collection form was adopted from WHO publication [3] and pre-tested. The pre-testing was done using 10 records of geriatric patients admitted to the medical wards of TUTH during the study period. The pre-tested data forms were re-checked and was then modified based on the sequence of the information placed at the medical record. One hundred medical records of geriatric patients were then randomly selected and data was entered into the modified form. Ten percent of the total samples collected were randomly selected and cross-checked against the actual patient records to validate the collected data.

Results

Majority, 63 (43 males, 20 females) of the patients were aged 65-74 years, 25 (15 males, 10 females) patients were 75-84 years and remaining 12 (5 males and 7 females) patients were 85 years and over. There were 63 males and 37 females. The male to female ratio was 1.70. Out of 100 patients, 20 died (13 males and 7 females), 3 left against medical advice (all females) and 77 (50 males and 27 females) were discharged from the hospital. Sixty-one patients were admitted for up to 1 week, 31 for up to 2 weeks and 8 for more than 2 weeks. The mean duration of hospital stay was 7.7 ± 5.8 days (range 1-35).

The most common diagnoses were respiratory diseases (39%) and cardiovascular diseases (31%). A total of 1,073 drugs prescribed for the 100 patients during their hospital stay (total of 770 days) with an average of 10.73 ± 5.34 drugs per patient (range 2-35). There was no significant sex difference in the average number of drugs prescribed (11.015 ± 5.65 for males and 10.24 ± 4.8 for females). Of the total drugs prescribed, 184 (17.2%) were fixed-dose combination products. These 184 drugs contained 487 active ingredients. If the individual components of the fixed dose combination is calculated, the average number of drugs prescribed rises to 13.76 per patients. The average number of drugs during discharge was 5.13 ± 1.85 (range 1-10).

Intravenous fluids were the most frequently prescribed drugs (9.8% of the total drugs) followed by respiratory drugs (9.7%), gastrointestinal drugs (9.6%) and cardiovascular drugs (8.2%). Table 1 presents top 10 most commonly prescribed drugs in the study population. Table 2 and 3 presents top 10 drugs prescribed for respiratory and cardiovascular diseases respectively.

Table 1: Top 10 commonly prescribed drugs for the geriatric patients (n = 100)

No.	Drug	% of patients receiving the drugs
1	5% Dextrose solution	61
2	Frusemide	58
3	Ranitidine	52
4	0.9% Sodium Chloride Solution	44
5	Amoxycillin + Clavulanic Acid	41
6	Paracetamol	40
7	Omeprazole	37
8	Amoxycillin	35
9	Salbutamol	34
10	Theophylline	31

Table 2: Top 10 drugs prescribed for patients with respiratory diseases (n = 39) during a hospital stay

No.	Drug	% of patients receiving the drugs
1	Theophylline	66.6
2	Frusemide	61.5
3	Ranitidine	48.7
4	Amoxycillin + Clavulanic acid	46.2
5	Paracetamol	41.0
	Salbutamol	41.0
6	Ipratropium bromide	35.9
7	Aminophylline	33.3
8	Omeprazole	30.8
	Amoxycillin	30.8
9	Vitamin B-complex	20.5
	Metronidazole	20.5
10	Aspirin	17.9

Table 3: Top 10 drugs prescribed for patients with cardiovascular diseases (n = 31) during hospital stay

No	Drug	% of patients receiving the drugs
1	Frusemide	80.6
2	Isosorbide mononitrate	74.2
3	Ranitidine	67.7
4	Aspirin	61.3
5	Omeprazole	48.4
6	Amoxycillin + Clavulanic acid	41.9
	Paracetamol	41.9
7	Amiloride	29.0
	Antacids	29.0
8	Digoxin	25.8
9	Salbutamol	22.6
	Ceftriaxone	22.6
10	Alprazolam	19.4

The total number of generics was 333 (31.03%) (range 0-10) out of all drugs prescribed. The longer the duration of hospital stay, the greater the number of drugs prescribed; average number of drugs was 9 (± 3.75) for those who were staying for up to 1 week, 12.2 (± 4.56) for those staying up to 2 weeks and 18.3 (± 9.66) for those staying more than 2 weeks. Eighty-nine percent of the patients received more than 5 drugs, 43 percent received more than 10 drugs and 16 percent received more than 15 drugs during hospital stay.

Fourteen percent of the admitted patients received multivitamins. Of the all drugs prescribed, 684 (63.75%) were prescribed from within the National List of Essential Drugs[5]. About three-quarters (73%) were prescribed antibiotics and 72 percent of patients received drugs intravenously. Out of 100 patients 29 percent patients received more than one antibiotic concomitantly. Amoxycillin and Clavulanic acid combination product was most frequently prescribed (41%) antibiotics followed by Amoxycillin (35%).

Discussion

Polypharmacy and associated adverse drug reactions have been reported from many countries around the globe[1,2,4,6,7]. Major polypharmacy was common in the medical wards of the TUTH as 89 percent of the study patients received more than 5 drugs, 43 percent received more than 10 drugs and 16 percent received more than 15 drugs during hospital stay. Prescription of an average of 5.13 drugs during discharge also supports the practice of polypharmacy in the study site.

The average number of drugs prescribed during hospital stay was 10.73 but due to frequent prescription of fixed dose combination products (17.2% in the study), patients were exposed to 13.47 different drugs during their hospital stay. This finding reveals that this can misled us while calculating number of drugs prescribed to the patients if all the ingredients of the fixed dose combination products are not considered.

Parenteral drug use was found to be a common practice in TUTH. Of the admitted patients, 61% received 5 percent dextrose solution, making it most frequently prescribed drug as in the earlier study[8]. For the patients with respiratory diseases (n=39), most frequently prescribed drug was theophylline (66.6%) followed by frusemide (61.5%) and ranitidine (48.7%). Frusemide, isosorbide mononitrate and ranitidine were prescribed for 80.6, 74.2 and 67.7 percents of the patients with cardiovascular diseases (n=31). The prescribing patterns for both respiratory and cardiovascular diseases are similar to the earlier study[8]. Nearly forty three percent (42.8%) of all the drugs were given parenterally either as a part or throughout the hospital stay to the study populations. This finding is consistent with the earlier study in the same hospital[8]. About three quarter (73%) of the patients were prescribed antibiotics and a combination of amoxycillin and clavulanic acid was the most frequently prescribed antibiotic (41 patients). This is quite interesting result as compared to earlier study in which ciprofloxacin was the most frequently prescribed antibiotic[8]. Bacteriological culture and sensitivity tests were done in three of the total 73 patients (4%) receiving antibiotics. This figure shows gross underutilization of culture and sensitivity tests in order to select the appropriate antibiotic.

More than two third (68.9%) of the total drugs were prescribed by brand or proprietary names which is higher than the earlier study[8]. Of the all drugs prescribed 63.75 percent were prescribed from the national list of essential drugs. This figure is lower than the figure from other developing countries[9, 10] and higher than in India[11].

The sample size of the present study was small, therefore direct extrapolation of findings to other hospital is not possible. Further large-scale study covering more hospitals in Nepal and large number of patient population is, therefore, recommended. In conclusion, there are numerous opportunities to improve prescribing practices for older people in the study site.

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