

# Investigation of Medication Use Safety for Elderly People and Research on its Relevant Methods

Wang Bin

*Nanyang Medical College, Nanyang Henan 473000*

**Abstract: Objective** Medication use safety is not only a matter of medicine, but a social concern to a great extent. The medication use safety of elderly people, a group that uses the most medicine on the most frequent basis, shall be paid high attention to by medicine field and the whole society. This article proposes some relevant methods of safe medication use for elderly people through their adverse drug reactions learned from the first affiliated college of our college. **Method** Choose the elderly patients received and cured by the first affiliated college of our college due to adverse drug reactions from January, 2011 to January, 2012, and adopt a time point survey method to make an analysis on daily medicine types, disease occurrence degree classifications and organs/systems related to outcomes and adverse reactions, meanwhile ask elderly patients about the details of their medicine taking using questionnaires... In 250 elderly inpatients, there are 3-27 types of medicine taken, and (12.40±7.23 ) on average, among which 60 inpatients (24.0%) had severe adverse reactions, 136 (34.4%) of moderate ones and 54 (21.6%) of mild ones. Of 250 elderly patients, only 5 don't take medicine at home (2.0%), 183 (73.2%) taking medicine by themselves and 67 (26.8%) taking medicine with the help of their children, spouses or housemaids. **Conclusion** Adverse reactions severely harm elderly people's life qualities, thus reasonable medication use guidance must be provided for them to reduce the occurrence thereof so that the safety and efficiency of medication use will be guaranteed.

**Keywords:** adverse reaction; Chinese traditional medicine; reasonable use; elderly people

## 0. Objective

Drug safety is one of the most important foundations of reasonable clinic medication. With the development of medical science, the types of drugs increase so sharply that the amount of available prescription drugs types in China reaches over 7000. And the physiology and pharmacokinetics of elderly people vary with increasing of ages, plus they generally will simultaneously have more than one diseases such as hypertension, diabetes, tumor, etc., which leads to use of relatively more types of medication that improves their chances to get adverse drug reactions. What's worse, they will be hospitalized owing to drug-induced diseases<sup>[1-3]</sup>. Medication error is a serious problem that consists in medical care of many countries.

One report from America says that even though great efforts have been made, medication error still accounts for 20% in medicine error<sup>[11]</sup>. In Australia, elderly people's chance to be hospitalized is increased (Statistical data from hospitals becomes the main source of adverse medication events report) and the occurrence of their adverse medication events will be also promoted due to using more medications. Adverse medication events cause a surprisingly great financial burden, and the annual cost of preventable medication error in America is up to 17-29 billion dollars<sup>[12]</sup>. But in Australia, this cost is estimated to hit 350 million dollars

annually<sup>[13]</sup>. As medication error may occur in every medication use stages from prescription of doctors to medication use for patients by nurses, and also in each division in health care system, the interference in all aspects of medication use is essential.

Therefore, medication use safety is not only a matter of medicine, but to a great extent a social concern. The medication use safety of elderly people, a group that uses the most medicine on the most frequent basis, shall be paid high attention to by medicine field and the whole society.

## 1. Data and Method

On how to prevent and reduce adverse drug reactions to improve medication safety for elderly patients, this research investigates adverse drug reactions of elderly patients due to unreasonable medication use in the first affiliated college of our college, aiming at providing research foundations for further improving the standardization and quality of medication use for elderly patients to prevent occurrence of adverse drug reactions.

### 1.1. General Data

All test objects include 250 elderly patients (112 male patients and 138 female patients that are over 60 years old) of adverse drug reactions due to unreasonable medication use in the first affiliated college of our

college. The patients and their family members agree to sign Informed Consent.

## 1.2. Investigation Method

Retrieve medication bills of the 250 inpatients in elderly wards in the first affiliated hospitals in our college from January, 2011 to January, 2012 by using time point survey method to make a statistical analysis on medication types and amounts; ask elderly patients about the details of their medicine taking through questionnaires.

## 1.3. Method

All the statistical data is handled and input to database by special persons, and SPSS15.0 statistical software will be used to make a statistical analysis on daily medicine types, degree classifications, organs/systems related to outcomes and adverse reactions and medication use at home.

## 2. Result

### 2.1. Daily Medicine Types for Elderly Patients

In 250 elderly inpatients, there are 3-27 types of medicine taken, and  $(12.40 \pm 7.23)$  on average. The daily medication use details are as in table 1.

### 2.2. Degree Classifications and Outcomes for Patients

As shown in statistical result, 60 inpatients (24.0%) had severe adverse reactions, 136 (34.4%) of moderate ones and 54 (21.6%) of mild ones. And of those 250 patients, 195 (78.0%) were cured, and 55 (22.0%) were on the mend.

### 2.3. Classification of Organs/systems Related to Adverse Reactions

As shown in the result, the damage which the adverse drug reactions impose on human body involves different organs/systems, and it has various clinical manifestations in which the damage to skin and its adnexa is most occurred, and it is mainly characterized by Sputum itching, rash, edema, skin erythema, etc.; and the second damage is to nervous system. See table 2 for details.

### 2.4. Medication Use for Elderly Patients at Home

As shown in the investigation result, of 250 elderly patients, only 5 don't take medicine at home (2.0%), and 67 (26.8%) taking medicine with the help of their children, spouses or housemaids. Among those patients, 130 patients admit they missed or took less or more than enough medicine, and 48 patients admit they privately took less or more than enough medicine, indicating a poor following of doctors' advice. See table 3 for details.

Table 1. Daily Medicine Types for Elderly Patients [n(%)]

Medicine types	Patients	Proportions (%)
Less than 5	21	8.4
6-15	175	70.
More than 15	54	21.6

Table 2. Classification of Organs/systems Related to Adverse Reactions (Patients, %)

Organs/systems related to adverse reactions	Patients	Proportions (%)
Damage to skins and its adnexa	123	49.2
Damage to nervous system	51	20.4
Systemic damage	40	16.0
Damage to digestive system	24	9.6
Damage to respiratory system	6	2.4
Damage to urinary system	3	1.2
Damage to metabolic endocrinology	3	1.2
Total	250	100.0

Table 3. Medication Use for Elderly Patients at Home [n (%)]

Investigation items	Self-use of medicine (n=183)	With the help of others (n=67)
Take medicine in strict accordance with doctors' advice	91 (49.7)	18 (26.9)
Self-use of medicine	48 (26.2)	3 (4.5)
Missed medicine	94 (51.4)	1 (16.4)
Took wrong medicine	36 (19.7)	0 (0)

### 3. Discussion

With the progress of society and improvement of people's living standard, the amount of elderly people will increase, and we'll face an increasingly serious aging situation. So the amounts and types of healthcare and treatment medication for elderly people are accordingly increased, which lead to drug abuse, interaction and adverse reactions that are drawing more and more attention of community from all sectors. There is a research indicating that at least one unreasonable joint use of medication exists in 0.75% of patients who take two or more prescription drugs<sup>[14]</sup>. The occurrence of drugs adverse interactions is in positive correlation with the types of medicine patients take, and more types will lead to higher chances of drugs adverse interactions to occur. Generally, elderly people cannot simultaneously take more than 5 types of medicine, which not only induces heavy financial burden, but also causes drugs adverse interactions and even rash, nausea, vomit, disorientation, functional incapacitation and viability reduction. As a statistical data shows, the occurrence of adverse reactions for one single drug is 10.8%, but will increase to 27% if taking over 6 types of medicine. So the diseases shall be treated according to their seriousness for the purpose of reducing drugs adverse reactions<sup>[5-7]</sup>. This investigation result indicates that there are a great number of elderly inpatients, and it is common for them to jointly take different medicine at a time because of the complicated conditions. In 250 elderly inpatients, there are 3-27 types of medicine taken, and (12.40±7.23 ) on average. Thus for the elderly people's medication use safety, it shall be noted that elderly people shall use as less medicine as possible, avoid jointly taking medicine of same types, take one single medicine according to the main diseases, use less than 3-4 types of medicine if joint use is required, and take less than 2-3 types of usual healthcare medicine.

The damage the adverse drug reactions impose on human body involves different organs/systems, and it has various clinical manifestations in which the damage to skin and its adnexa is most occurred, and it is mainly characterized by sputum itching, rash, edema, skin erythema, etc. The serious reactions include expiratory dyspnea, acute renal dysfunction, etc., which may be caused by skin allergy easily observed and identified by nurses clinically. The serious reactions include expiratory dyspnea, acute renal dysfunction, etc.; and the second damage is to nervous system. See table 2 for details. Therefore, to adopt pertinent precautions based on further clinical observance is essential.

As the society develops, it is increasingly common to see elderly people living alone in the empty nest. Most of them live by themselves, and some have difficulties in reading and understanding drugs instructions due to loss of memory and understanding ability, illiteracy, as well as lack of medical and pharmaceutical knowledge. They often put 3-7d drugs together and take them in accordance with meals. However, some drugs shall be kept in a sealed container or away from light, and putting them together will not only reduce the efficacy, but also interact with other drugs or matters in the air. Furthermore, when taking

medicine at home, all the elderly people didn't check its procedure, and some took medicine repeatedly or forgot to take medicine, or even hospitalized for poisoning by drug overdose<sup>[8-9]</sup>. All the above can be considered as hidden danger of medication use for elderly people. Therefore, the author suggests to promote the intensity and broadness of community healthcare involvement as soon as possible in compliance with the requirement of aging society development, and to establish drug dispensing center in communities that are densely populated by elderly people. Nurses shall be responsible for making round visits and dispensing drugs on a daily basis, as well as urging and observing the medicine taking conditions of elderly people, aiming at avoiding or reducing the occurrence of drug-induced diseases to ease the burdens of society and families.

The investigation of medication use for elderly people in Daxing Region of Beijing indicates that the management knowledge score for lower-educated elderly people that live in Daxing Region and buy medicine at their own expense is relatively low, and the same is for their drugs management. This may be related to their lack of drug information sources and knowledge<sup>[10]</sup>.

### 4. Conclusion

Adverse reactions of medication disrupt the life qualities and prolong the course of diseases for elderly people, which indirectly have an impact on their family lives. Thus correct guidance shall be provided for them when giving elderly people reasonable medication use service, to reduce the occurrence of adverse reactions so that the safety and efficiency of medication use will be guaranteed.

For the adverse reactions during the course of using medicine, we shall first take into account the actual conditions to decide whether to use medicine or not, because some diseases can be self-cured only by reasonable diet and regular routine, but some other diseases will miss its best treatment opportunity if not treated in time. For some diseases that is not necessary to be treated by medicine, the medicine shall be used as less as possible. For some clearly diagnosed diseases, adequate medicine shall be used to treat them. Moreover, we shall seek the most appropriate dose by strictly complying with individuation principle. Most of medicine shall be gradually increased from the minimum dose during its use, until it reaches the minimum safe and efficient maintenance dose. The regular dose for elderly people is 25-35% of that for adults, and it shall be closely observed and adjusted in time. Besides, medication shall be used in a simple and single manner according to the actual conditions of diseases to reduce the adverse drug reactions. When joint use of medicine is required, the medicine types shall be as less as possible, and we shall closely monitor the interactions among drugs. Furthermore, it shall be essential to strengthen the monitoring of medicine, seek evaluation systems suitable for features of medicine for elderly people and set up the technical requirements and standards that are in accordance with safety, efficacy and high efficiency, for the purpose of basically

eliminate the adverse drug reactions. Regularly examine liver and renal function, as well as electrolyte and acid-base balance, and perform TDM for some medicine, then treat the patients according to their clinical responses.

In detailed course of diagnosis and treatment, some aspects shall be noted:

The doctors shall propose a simple and clear therapeutic regimen for elderly people to know the method of using medicine. In consideration of various chronic diseases the elderly people may normally have, the doctors shall be aware of the actual diseases during the course of diagnosis, seize the principal contradiction to use medicine purposively, avoid using ancillary drugs and jointly using medicine that have the same functions or may cause the same adverse reactions. Generally, the jointly-used medicine types shall be limited to less than 4.

Improvement of elderly people's dependence on medication use is a premise to heighten the cure rate and reduce the risk of using medicine. While the best way of improving their dependence is to promote the education and knowledge about medicine<sup>[14]</sup>. By establishing a medicine consultation counter in outpatient service, the pharmacists can provide face-to-face guidance for patients and their family members; or dispense manuals and notes of reasonable medication use; or provide consultation for patients online and by phone; or regularly give lectures of reasonable medication use or other forms and methods, for the purpose of making elderly people and their family members correctly follow the doctors' advice to let the medicine reach its highest efficiency; Meanwhile, the doctors should tell the elderly people not to easily believe the promotions of advertisements, to privately use the medicine involved therein or to abuse the so-called secret prescription or invigorant, aiming at minimizing the adverse drug reactions and drug-induced diseases to improve the life qualities for elderly people.

## References

- [1] Wu Yulin, Wei Xiaoling, Zhou Ning, Li Yue, Li Hong. View Points of Medication Use Safety for Elderly People from One Hyperpotassemia Patient[J]. Chinese General Practice: Doctor Readers Version, 2010(3):68-68.
- [2] Zhang Jianxin, Wang Ling. Several Problems of Medication Use for Elderly People that shall be Noticed[J]. Chinese Journal of Practice Medicine, 2006, 5(6): 658-659.
- [3] Zhao Zune, Zhang Baocan. Discussion of Adverse Drug Reactions among Elderly People and the Reasonable Use of Chinese Traditional Medicine[J]. Chinese Journal of Modern Drug Application, 2009(5):11-12.
- [4] Liu Wenjun, Li Shuxia. Analysis on Adverse Drug Reactions among Elderly People [J].Chinese Journal of Celiopathy, 2003, 3(6):425-425.
- [5] Lei Jie Bao, Haiyan. Investigation and Analysis on Adverse Reactions Report for 163 Drugs [J]. Ningxia Medical Journal, 2010, 32(7):666-667.
- [6] Yu Die, Li Shuping, Zhong Lei, Tian Huijun. The Curative Effect of Calcium Dobesilate on Chronic Renal Insufficiency for Elderly Males and Research on its Medication Use Safety [J]. Chinese Journal of Multiple Organ Diseases in the Elderly, 2007, 6(6):425-426.
- [7] Hou Huiru, Wang Xiaoyuan. Investigation and Analysis on Oral Medication Use for Elderly Inpatients [J]. Modern Nursing, 2007, 13(05X):1435-1436.
- [8] Chen Guixiang. Analysis on Adverse Reactions Report for 175 Anti-infection Drugs [J]. Chinese Journal of Modern Drug Application, 2010(14):149-151.
- [9] Liu Zhongjiu, Liu Wei. Discussion of Medication Use Safety for Elderly People[J]. China and Foreign Medical Journal, 2005,3(10):73-74.
- [10] Zhou Yunyun, Guo Guifang. Investigation and Analysis on Management of Medication Use for Elderly People in Communities [J]. Journal of Nurses Training, 2002(07):557-559.
- [11] Durieux P,Trinquant L,Colombet I, et al. Computerized Advice on Drug Dosage to Improve Prescribing Practice [J] . Cochrane Database Syst Rev, 2008,16(3):CD002894.
- [12] Strohecker S. Medication Management. Polished Automation Tools Allow Patient Safety to Shine [J] .Nurs Manag, 2003,34(34):6,8 passim.
- [13] Routhead EE, Gilbert AL, Primrose JG, et al. Drug Related Hospital Admissions: a Review of Australian Studies Published 1988-1996 [J] . Medical Journal of Australia, 1998,168: 405-408.
- [14] Qi Xiaolian, Wang Yuqin. Investigation and Analysis on Dependence on Medication Use for Different Elderly Populations [J].Chinese Pharmaceutical Journal, 2002,37(2): 141.