

Research Paper

Inappropriate Medication Use and Related Factors in the Elderly Living in Northern Iran



Afsaneh Dadashihaji¹, *Atena Rahimi^{1,2}, Seyed Reza Hosseini³, Ali Akbar Moghadamnia^{1,2}, Ali Bijani³

1. Department of Pharmacology and Toxicology, School of Medical, Babol University of Medical Sciences, Babol, Iran.
2. Cellular and Molecular Biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.
3. Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.



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ABSTRACT

Objectives Older people are more prone to chronic diseases and are being treated than other age groups; as a result, they use more drugs that may be inappropriate and lead to adverse drug reactions. This study aimed to determine the rate of inappropriate drug use using the Beers criterion among the elderly in Amirkola City.

Methods & Materials The current descriptive-analytical study is part of the comprehensive plan "Study of the health status of the elderly in the Amirkola City" AHAP" (No.: 892917) which has been conducted as a Cohort study since 2011 on all people aged 60 and over in the Amirkola City, north of Iran. Necessary information was collected by a trained person using standard questionnaires that included the number, type and duration of drug use. The collected data were analyzed after entering the SPSS statistical software using Chi-square, Fisher's Exact Test, and Logistic Regression to evaluate the status of inappropriate drug. P-value=0.05 was considered as a significant level.

Results The Mean±SD age of the elderly was 69.71±7.47 years. Prevalence of inappropriate drug use and drugs that should use by caution among the elderly was 37.58% and 29.85%, respectively. Glibenclamide (12.7%), Diclofenac (8.8%) and Clidinium C (5.4%) were among the most inappropriate drugs used in this population. The highest drug-drug interaction was related to the simultaneous use of two anticholinergic drugs. There was a statistically significant relationship between inappropriate drug use with gender, age, education level, employment status and marriage status (P<0.05).

Conclusion The rate of inappropriate drug use among the elderly in Amirkola is high compared to many other studies that expose the elderly to adverse drug reactions.

Extended Abstract

1. Introduction

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he elderly suffer from chronic diseases more than young adults, which is why

multidrug therapy is more common in them. Some of these drugs are considered as inappropriate medications [1]. Numerous studies have been conducted around the world and in Iran on the Inappropriate Medication Use (IMU) in the elderly [2-6]. Recent studies have shown that there is a close relationship between the increased IMU and the incidence of physical and cognitive disorders [7, 8]. More studies on the IMU in the elderly can help prevent these complications

* Corresponding Author:

Atena Rahimi, PhD.

Address: Department of Pharmacology and Toxicology, School of Medical, Babol University of Medical Sciences, Babol, Iran.

Tel: +98 (11) 32199592

E-mail: atena.rahimi@yahoo.com

and improve the health status of this population. Since no study has been conducted on the IMU among the elderly in northern Iran, this study aims to investigate the prevalence of IMU in the elderly living in northern Iran and prepare a list of inappropriate medications.

2. Methods & Materials

This study is a part of Amirkala Health and Ageing Project (AHAP) conducted as a cohort study on older adults since 2011. Age ≥ 60 years, residence in Amirkala county, and willingness to participate in the study were considered as inclusion criteria, while the lack of sufficient information was considered as the exclusion criterion [9]. The required information was collected by a two-part questionnaire with 17 items; the first part consists of 5 questions about the demographic characteristics of participants (age, marital status, level of education, employment status, smoking, underlying diseases, etc.) which was completed through interview, and the second part is a self-report with 12 items

assessing the medication information (number and type of medication, and usage duration). Then, the IMU in the elderly was evaluated according to the 2012 Beers criteria [10] regarding the drugs that should not be prescribed in the elderly, the drugs that should be prescribed with caution, drug interaction, and the use of drugs with strong anticholinergic properties. The collected data were statistically analyzed in SPSS version 23 software by using chi-square test, Fisher's exact test, and logistic regression analysis. The $P \leq 0.05$ was considered as the significance level.

3. Results

A total of 777 elderly people aged 60-92 years (Mean age= 69.71 years) participated in this study, of which 437 (56.2%) were male and 340 (43.8%) were female. A total of 292 older adults (37.58%) used inappropriate drugs according to Beers criteria. Among the inappropriate drugs, the most used drugs were glibenclamide (12.7%), diclofenac (8.8%) and clidinium-C (5.4%). Table 1 shows the results of chi-

Table 1. Chi-square test results of examining the relationship between demographic variables and the use of inappropriate medications

Variables	Demographic Factors	IMU		Sig.	Test Statistic
		No. (%)			
		No	Yes		
Gender	Male	136 (31.1)	301 (68.9)	<0.001	17.76
	Female	156 (45.9)	184 (54.1)		
Age	60-64	98 (37.5)	163 (62.5)	<0.001	6.31
	65-69	59 (36)	105 (64)		
	70-74	48 (35)	89 (65)		
	75-79	47 (36.4)	82 (63.6)		
	80-84	22 (40)	33 (60)		
	85-99	18 (58.1)	13 (41.9)		
Educational level	Illiterate	200 (39.4)	308 (60.6)	0.036	3.91
	Elementary and middle school	71 (32.3)	149 (67.7)		
	High school and university degree	21 (42.9)	28 (57.1)		
Employment status	Unemployed	220 (75.3)	306 (24.7)	<0.001	29.65
	Employed	72 (24.7)	179 (75.3)		
Marital status	Married	243 (36.8)	418 (63.2)	0.046	1.26
	Not married	49 (42.2)	67 (57.8)		

Table 2. Logistic regression analysis results for determining the role of factors associated with IMU in the elderly

Demographic Factors		Probability	Odds Ratio	95%CI	
				Lower Bound	Upper Bound
Gender	Male	-	1	-	-
	Female	0.043	1.427	1.011	2.015
Age	60-64	-	1	-	-
	65-69	0.457	0.845	0.543	1.316
	70-74	0.375	0.804	0.496	1.303
	75-79	0.787	0.934	0.568	1.536
	80-84	0.973	1.012	0.516	1.985
	85-99	0.004	3.421	1.481	7.901
Educational level	Illiterate	-	1	-	-
	literate	0.320	1.195	0.841	1.697
Employment status	Unemployed	-	1	-	-
	Employed	0.002	0.356	0.183	0.692
Marital status	Married	-	1	-	-
	Not married	0.248	1.319	0.824	2.112
Multidrug use	No	-	1	-	-
	Yes	0.001	4.198	2.880	-6.119

square test for evaluating the relationship between demographic variables and IMU. As can be seen, the amount of used inappropriate drugs was significantly different between older men and women ($P < 0.001$) where women used more inappropriate drugs than men. The IMU rate was higher in those aged > 80 years and there was a significant relationship between age and IMU ($P < 0.001$). Educational level ($P = 0.036$), employment status ($P < 0.001$) and marital status ($P = 0.046$) were another effective factors in IMU. Among the participants in this study, 13 (1.7%) used drugs that interacted with each other according to Beers criteria, where the most drug interaction was related to the concomitant use of anticholinergic drugs. Moreover, it was found that 75 older adults used drugs with anticholinergic properties. The highest frequency was related to Clidinium-C (4.6%).

Logistic regression analysis was used to determine the role of some variables affecting the IMU in the elderly. The results (Table 2) showed that gender, age > 85 years, employment status and multidrug use (polypharmacy) had a

significant effect on IMU where that the likelihood of using inappropriate drug in women was 1.427 times higher than in men (95%CI: 1.011-2.015). Subjects over the age of 85 were 3.421 times more likely to use inappropriate drugs than those aged 60-64 years (95%CI: 1.011-2.015). The likelihood of taking an inappropriate drug in subjects with multidrug use was 4.19 times higher than those with no multidrug use (95%CI: 2.880-6.119).

4. Conclusion

The elderly in northern Iran are relatively exposed to IMU. Age over 85 years, employment status and multidrug use are the predictors of IMU. Older women use inappropriate medications more often than older men. Due to the fact that the side effects of taking inappropriate medications can be serious, proper administration of medications in the elderly is very important. Therefore, it is necessary to provide more educational courses to doctors, nurses and patients, and more supervision by the authorities.

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