



Feature Article

Pharmacotherapy and over-the-counter drug use among elderly in Belgrade, Serbia

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ABSTRACT

From November 2012 to January 2013, 480 seniors were recruited at the Public Health Center in Belgrade, Serbia. The patients' records were validated by four independent investigators. Data on over-the-counter (OTC) drug use were collected through a questionnaire. Polypharmacy, an intake of ≥ 5 prescribed medications, reported in 10.4% of seniors, was associated with cardiovascular (odds ratio [OR] = 3.07; 95% confidence interval [CI] = 1.12–8.39) and endocrine diseases (OR = 2.25; 95% CI = 1.05–4.84) as well as with the number of treated chronic conditions (OR = 2.45; 95% CI = 1.75–3.44). The most frequently used OTC drugs were analgesics (metamizole, diclofenac and acetaminophen) and vitamins (vitamin C and vitamin B complex). The number of treated chronic conditions was associated with use of OTC drugs (OR = 1.17; 95% CI = 1.01–1.36). Multiple chronic conditions correlated with multiple OTC drug use ($\rho = 0.125$, $p = 0.019$). Our analysis indicated that the prevalence of polypharmacy and OTC drug use in the elderly are comparable to those in industrialized countries.

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Introduction

A high demand of drugs has been related to global aging of the population.¹ An increasing trend in multimorbidity, presence of two or more chronic conditions, has been observed in the population of older adults,² with estimated prevalence of 62% in those aged 65–74, up to 81.5% in those older than 85 years.³ The Republic of Serbia, on the other hand, experiences economic transition and a reform of primary health care sector;⁴ however, it is expected that multimorbidity in elderly follows the pattern of that in industrialized countries.⁵

Self-medication with over-the counter (OTC) drugs is defined as individual's intake of medicines not prescribed by a physician in order to treat untreated or undiagnosed conditions.⁶ Over the recent years, it has been observed that a high level of OTC drugs is being used among older adults.^{7–11} Certain factors associated with OTC drug use have been highlighted, such as being female and a higher level of education.¹² Additionally, in this population group multiple chronic conditions are related to polypharmacy,¹³ defined as intake of more than 5 prescribed medications. Subsequently, polypharmacy also appears to be associated with OTC drug use.¹⁴

In the Republic of Serbia, new rules and regulations regarding contents and methods of labeling the outer and immediate packaging of medicines were recently implemented.¹⁵ Additionally, the Medicines and Medical Devices Agency of Serbia has issued a list of around 300 OTC drugs that can also be advertised in the media.¹⁶ Most drugs on the list represent a range of analgesics and herbal extracts used in different purposes.

Given that health indicators suggest an increase in multimorbidity trend and that a range of OTC drugs is available in the Serbian market, there have been no data regarding the extent of its use in the population of older adults. We, therefore, hypothesized that prevalence of polypharmacy is comparable to that in industrialized countries as well as that multiple chronic conditions are associated with OTC drug use. The purpose of this study was to assess the prevalence and factors associated with polypharmacy and OTC drug use in the population of persons over 65 years of age.

Material and methods

Setting

The investigation, designed as a cross-sectional study, was conducted at the Public Health Center "Vračar." In the Republic of Serbia a Public health center represents an institution designated to provide primary health care in the local community. The compulsory departments in a public health center comprise general

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practice, pediatrics, gynecology and dentistry; hence, it represents a chief institution when requiring medical assistance other than emergency department. Activities of public health center are focused around a municipality where the center is located. Persons residing on the territory of the municipality are required by law to have their health record at the public health center located in the corresponding municipality. Belgrade, the capital of the Republic of Serbia with population of around 1.6 million inhabitants, is divided in relation to the geographical position in 17 urban municipalities and therefore has 17 public health centers. The municipality of Vračar was chosen because of the highest proportion of elderly registered as permanent community-dwellers among the total population in the area (20.8%).¹⁷

Subjects

From November 2012 to January 2013, 480 persons above 65 years of age, randomly chosen from the waiting list, were recruited while attending regular check-ups at the Public Health Center. The inclusion criteria for the study were: the Mini Mental State Examination (MMSE)¹⁸ score of ≥ 24 and the consent to participate. The exclusion criteria were following: the presence of major visual, audio and neurological impairment. Of 480 seniors, 354 met the criteria (73.7%). Of 126 subjects who did not meet the inclusion criteria, 85% (107 study subjects) declined participation in the survey. Participation in the study was anonymous. Ethical approval for the study was obtained from the Institutional Review Board of the Faculty of Medicine, University of Belgrade.

Data collection

Data on chronic diseases and current therapy were obtained from medical records of the Public Health Care Center. The records with patients' histories and corresponding therapies were validated by four independent investigators (SN, IK, NK, TG). Data regarding OTC drug use were collected through a questionnaire as well as socio-demographic characteristics (age, gender, education level, marital status, average monthly income and number of members in the household) of the participants. OTC drug use was related to the type and quantity of medication and frequency of use in the period of 1 month prior to survey. In addition, the patients were asked to explain the reasons for choosing a particular OTC drug, whether it had a desired effect on their health status and the location of purchase.

Data analysis

Prevalence was calculated as a proportion of those reporting OTC drug intake over the total number of study subjects. Proportions were also used to describe frequency of use in particular OTC drug categories. Spearman's and Pearson's correlation tests were used to investigate association between selected variables. The univariate logistic regression was performed to assess the contribution of variables to previously defined outcomes (use of 1 prescribed drug, polypharmacy and OTC drug use). As a measure of effect size, odds ratio (OR) was used to describe the strength of association between the variables and the outcome. The probability level of ≤ 0.05 was considered statistically significant. For statistical analysis the SPSS 17.0 statistical software package (SPSS Inc., Chicago, IL, USA) was used.

Results

Average age among 354 respondents was 73.6 ± 5.6 years (the youngest respondent was 66, while the oldest was 89). Basic

Table 1

Basic demographic characteristics of older adults in Belgrade, Serbia.

Variable	Count (N = 354)	Percentage
Gender		
Male	155	43.8
Female	199	56.2
Marital status		
Single	11	3.1
Married/cohabitating	190	53.7
Divorced	21	5.9
Widowed	132	37.3
Education level (years of schooling)		
Primary (1–8)	61	17.2
Secondary (9–12)	152	43.0
University (>13)	141	39.8
Employment status		
Employed	15	4.2
Retired	339	95.8

demographic characteristics of the subjects are presented in Table 1. Our respondents lived, on average with 2.3 members of the household. The mean monthly household income was $51,600 \pm 32,440$ Serbian dinars (equivalent of 463 ± 291 Euros).

Of total study population, 26 (7.6%) were not diagnosed with any chronic condition and therefore were not taking any therapy. Seventy three respondents (20.6%) were treated for one, while 255 (72.0%) were treated for 2 or more chronic conditions. The most common chronic conditions were cardiovascular diseases (83.0%), followed by disorders of the endocrine system (58.0%), rheumatic (16.7%) and neuropsychiatric disorders (13.8%), respiratory (11.9%) diseases. Eye (10.9%), urologic (10.3%) gastrointestinal (9.6%) and skin diseases (1.0%) were the least frequent.

Of 328 respondents who used prescription drugs, 186 (56.7%) were women. In the same group, the average number of prescribed medications per day was 3.4 (with a minimum of 1 to a maximum of 13, in one patient (0.3%)). Polypharmacy was documented among 34 (10.4%) older adults. The distribution of prescribed medications followed the pattern of distribution of chronic conditions. In the univariate linear regression model, cardiovascular (OR = 4.55; 95% CI = 2.22–9.82) and disorders of the endocrine system (OR = 3.60; 95% CI = 1.44–9.00) were singled out as factors associated with the use of more than one prescribed drug. However, the same model demonstrated that polypharmacy was associated with previously mentioned chronic conditions (OR = 3.07; 95% CI = 1.12–8.39 for cardiovascular, OR = 2.25; 95% CI = 1.05–4.84 for endocrine diseases) as well as with the number of treated chronic conditions (OR = 2.45; 95% CI = 1.75–3.44).

In terms of self-medication, in the total sample of 354 older adults, 202 (57.0%) reported OTC drug use in the period of 1 month prior to survey (in those treated for chronic conditions the proportion of OTC drug use was 57.4% (188 respondents), while it was 53.8% (14 respondents) in the healthy). Among OTC drug users, almost two thirds (128 subjects, 63.4%) were women. A little more than one half (112 respondents, 55.4%) reported using one OTC drug. The remaining 90 respondents (44.6%) used up to 5 OTC drugs. Types of OTC drugs used among older adults in Belgrade, Serbia is shown in Fig. 1.

The most frequently used OTC drugs were analgesics (24 (29.0%) seniors reported intake of metamizole, 20 (24.0%) reported diclofenac and 18 (21.5%) acetaminophen; the other 19 (24.5%) reported intake of ibuprofen and nimesulid). About one third of older adults (72 respondents) used some sort of supplementary vitamins. In this group 35 (48.6%) seniors reported the intake of vitamin C and 32 (44.5%) reported taking vitamin B complex, however, other multi-vitamin complexes, folic acid and vitamin E were used to a lesser extent. A total of 36 seniors (17.8%) practiced oligoelement intake,

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