ORIGINAL ARTICLE

ANALYSIS OF MEDICINAL PROVISION OF PATIENTS WITH ARTERIAL HYPERTENSION IN HOSPITAL CONDITIONS

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ABSTRACT
The aim: The aim of the study was to study drug consumption in pharmacotherapy of arterial hypertension in a hospital setting.
Materials and methods: In the course of work medical cards of patients of the Kyiv regional Cardiac Dispensary in the conditions of inpatient treatment were used. Methods such as: questionnaire, pharmacoeconomic, expert assessments were used.
Results: One of the main issues of drug supply for the population, in particular for patients with arterial hypertension, is the study of the demand and consumption of drugs. The drugs used to treat hypertension belong to different pharmacotherapeutic groups and are used in the treatment of a number of other diseases. Recent years of development of the domestic pharmaceutical market are characterized by an increase in the number of these drugs.
Conclusions: One of the main issues of drug supply for the population, in particular for patients with arterial hypertension, is the study of the demand and consumption of drugs. As a result of the study, an analysis of the range of drugs for the treatment of hypertension, a comparative study of the market of offers and prices for the treatment of hypertension was carried out.

KEY WORDS: arterial hypertension, cardiovascular diseases, marketing research, pharmacotherapy

INTRODUCTION

An analysis of the range of drugs for the treatment of hypertension, a comparative study of the market offers and prices for the treatment of hypertension [1].

In technologies for the treatment of hypertension, medicines are used today that belong to fourteen pharmacological groups (first-level drugs – diuretics, beta-adrenergic receptor blockers, ACE inhibitors, blockers of alpha-adrenergic receptors, angiotensin II receptors and calcium channels; the second level – agonists of alpha-receptors of the central actions, central and peripheral sympatholytics, vasodilators, potassium channel activators, ganglion blockers, drugs with myotropic action; drugs of a new generation – agonists of imidazoline receptors, calcium ion antagonists and blockers of alpha-1-adrenergic receptors simultaneously), as well as combined drugs. Pharmacological groups of drugs of the first level are recommended for the treatment of arterial hypertension by the World Health Organization [2, 3].

THE AIM

The aim of the study was to study drug consumption in pharmacotherapy of arterial hypertension in a hospital setting.

MATERIALS AND METHODS

The base of the experimental study was the Cardiological Dispensary of the Kyiv Health Department. Subjects of research – medical records, which were selected by the method of free sampling. A total of 1038 case histories were analyzed for 2019.

RESULTS

Each case history was analyzed according to the following criteria: the name, sex and age of the patient, the stage of arterial hypertension, the length of stay of the patient in the hospital, concomitant diseases, the appointment of a cardiologist, the cost of pharmacotherapy [4, 5]. Microsoft Excel spreadsheets were used for mathematical data processing.

As can be seen from Table I, 12,5 % of case histories belonged to the first stage of arterial hypertension, 71,2 % to the second, 20,1 % to the third. More than half of all patients were women. The average age of the patients was 42,6, 50,2 and 52,1 years in accordance with the stages of the disease. A similar trend is observed for the average length of hospital stay. At the same time, the deadlines (4 and 30 days) are typical for patients with the first and second stages of arterial hypertension, respectively. For half of the patients, hypertension was characterized by a crisis course. On average, during the treatment period, one patient of the first stage of arterial hypertension was prescribed 9,4 drugs, the second – 12,3 and the third – 10,7. The studied nomenclature of drugs prescribed by cardiologists amounted to 107 drugs in the form of 118 trade names, the total index of occurrences of which in the

Table I. Quantitative characteristics of case histories

№	Indicators	Stage of arterial hypertension			Total
		First	Second	Third	
1.	The number of case histories	125	712	201	1038
	- incl. in %	12,5	71,2	20,1	100,0
2.	Patient gender, in %:				
	- female	62,1	55,8	52,2	56,7
	- male	37,9	44,2	47,8	43,3
3.	Patient's age, in years:				
	- minimum	21	37	49	36
	- maximum	71	74	75	73
	- middle	42,6	50,2	52,1	48,3
4.	Number of days of hospital stay	1625	10228	2427	14280
5.	Length of stay of one patient in the hospital, days:				
	- minimum	8	11	16	12
	- maximum	21	25	23	23
	- middle	10,8	13,6	15,8	13,4
6.	The incidence index of concomitant diseases, units	425	3475	1278	5178
7.	The number of concomitant diseases per patient, units:				
	- minimum	1	2	3	2
	- maximum	8	14	11	11
	- middle	4,0	4,5	5,8	4,8
8.	The total number of medical appointments, units	1247	8201	1170	10618
9.	The number of prescribed drugs for one patient, units:				
	- minimum	4	5	6	5
	- maximum	17	21	20	19
	- middle	9,4	12,3	10,7	10,8
10.	The total cost of pharmacotherapy for a certain sample of patients, UAH	12047,50	62247,20	20142,30	94437,0
11.	The total cost of pharmacotherapy for a certain sample of patients, UAH:				
	- minimum	31,20	55,40	29,45	38,68
	- maximum	185,40	248,20	294,50	242,70
	- middle	82,50	98,40	90,55	90,48
12.	Correlation coefficient between the length of stay and the cost of pharmacotherapy per patient	0,57	0,69	0,50	0,59

case histories was 10618. Antihypertensive drugs account for 34,8 % of all medical prescriptions. In general, in the structure of antihypertensive drugs prescribed to patients, diuretics accounted for 32,5 %, calcium channel blockers – 16,4 %, ACE inhibitors – 15,7 %, drugs with myotropic action – 12,7 %, combined drugs – 8,1 %, beta-blockers – 6,3 %, central alpha-adrenergic receptors – 4,9 %, ganglion blockers – 3,4 %.

In total, the doctors of the cardiological dispensary prescribed 20 antihypertensive drugs (by international names) in the form of 29 trade names. The dominant group (75 % of medical prescriptions) among medicines (by international names) consisted of eight drugs (that is, 31,6 % of their total number), namely: furosemide (diuretic), diltiazem (calcium channel blocker), enalapril (inhibitor ACE), bendazole (myotropic effect), triamterene + hydrochlorthiazide (combined diuretic), atenolol (beta-blocker), hydrochlorthiazide (diuretic), clonidine (central alpha-adrenergic receptor). The most popular antihypertensive drugs by trade names are: dibazol (myotropic action), triampur compositum (combined diuretic), diltiazem (calcium channel blocker), lasix and furosemide (diuretics), atenolol (beta-blocker), cortiazem retard (calcium channel blocker), enalapril and enap (ACE inhibitors), hypothiazide (diuretic) and clonidine (central alpha-adrenergic receptor). The drugs listed above (19,4 % of the total number of trade names) constitute the dominant group of trade marks that are used in antihypertensive therapy.

In the process of determining the cost indicators, the number of units of the drug (tablets, drops, etc.), which were prescribed to the patient during his stay in the hospital, was first established, and then its cost was established. Calculations have shown (table 1) that the cost of pharmacotherapy for one patient with arterial hypertension (stage 1) is on average UAH 82,50 with a range of variation from 31,20 to 185,40 UAH. For the second stage, the average cost was 25,3 % higher and amounted to UAH 98,40 with a range of variation from UAH 55,40 to 248,20. The final stage of the study was a comparative analysis of the list of drugs prescribed by inpatient cardiologists and the restrictive List of drugs allowed for purchase by State Medical Institutions. The results of the analysis showed that of the 118 assigned funds, 38,2 % were not included in the restrictive List. They were prescribed to patients in 29,6 % of cases and on average accounted for 32,2 % of the cost of pharmacotherapy per patient.

DISCUSSION

The experience of European countries shows that the solution to the issue of providing the population with quality and affordable drugs is in the sphere of influence of the formulary system of medicines as a component of industry standards in the field of health care. Works are devoted to the methodological principles of creating a formulary system at the state level, its organizational features V.I. Maltsev, A.M. Morozov, V.D. Parii et al.; A.B. Zimenkovskyi et al. Given the rather dynamic development of pharmacy in recent years, changes in society in all countries, we believe that the future of pharmacy, its development as part of the pharmaceutical supply system, as well as its interdisciplinary and intersectoral nature, are closely linked to changes in socio-economic, political, cultural and educational life of Ukraine. According to a modern model of hypertension management, the patient and not his/her disease has a central role and is directly involved in his/her health care management in collaboration with the physician, family, and community, each other interacting in different ways to influence and support health decision [6]. This approach also emphasizes that patients with the same disease are nonetheless different from one another, due to differences in genetic predisposition as well as underlying mechanisms for high BP. Thus, different subjects may respond differently to the same antihypertensive treatment and a traditional population-based approach may not be effective. Rather an individualized or personalized approach is required, according to a modern medical model often referred to as «precision medicine» [7]. This article has summarised the current evidence related to hypertension screening and management in community pharmacies. The strongest evidence in support of pharmacist involvement relates to their role in managing hypertension, where meta-analyses have suggested that BP can be significantly reduced by up to 7 mmHg over usual GP care. Despite this, there are a lack of economic analyses and «hard outcomes» (e.g. CV events) that would likely aid the translation of the existing evidence from trial settings into real-world practice. Our results showed that the number of types of antihypertensive drugs was larger in hospitals equipped with ≥ 200 beds than in smaller facilities, and the proportion of patients who were prescribed > 2 antihypertensive drugs was the same. The difference showed statistical significance, indicating the association between facility size and the intensity of hypertension therapy. This result might indicate that the patients with difficult-to-control hypertension, to some extent, visit larger, experienced facilities, but the difference was not so large. First, the database used in this study only contained administrative data, and no blood pressure or chemical examination data were available. Therefore, we could not extract adequate outcomes or comorbidities from the viewpoint of pathophysiology, but could only estimate them from prescription and diagnosis data. Financial incentives for reimbursement and governmental punishment for overcharge may make the prescription data accurate, but the association between prescription claim and patient conditions has not yet been proven. Regarding diagnosis information related to kidney disease, as also mentioned in the discussion section, its sensitivity was reported to be low. Therefore, information related to these strata is limited. Second, we could not distinguish physicians' intention of prescription other than lowering blood pressure. For instance, we could not omit beta-blocker prescription for heart failure or diuretics for hypervolemia. Owing to this limitation, the mean number of antihypertensive agents increased, and the proportion of refractory hypertension also increased. Finally, the data obtained were those accumulated in only one month, October. We could not take seasonal effects into account, and we might have missed patients whose hypertension was managed but did not visit a healthcare facility during this month. In addition, the consultation interval can be different between large hospitals and clinics due to the difference in background comorbidities, which were not adjusted for in the aforementioned stratification. Therefore, this variation in consultation interval may have also affected our results. Ideally, our investigation would be more accurate when utilizing the whole claims data from the ministry. However, restricting laws and regulations are far stronger if we intend to use the whole data compared to the sampled data that we analyzed in the present study. To effectively examine the current healthcare situation, our method has certain rationality even though some limitations exist [8].

CONCLUSIONS

Thus, on average, more than half of the cost of pharmacotherapy for one patient with arterial hypertension, including more than three quarters of the cost of antihypertensive drugs, was provided not at the expense of state guarantees of free medical care, but in other ways. This is the purchase of the necessary medicine by the patient himself or his family.

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Conflict of interest:
The Authors declare no conflict of interest.

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