

ОРГАНІЗАЦІЯ ТА ЕКОНОМІКА ФАРМАЦІЇ

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ASSESSMENT OF THE RATIONAL USE OF BUDGETARY FUNDS ON DRUG SUPPLY BY HEALTHCARE INSTITUTIONS UNDER THE CONDITIONS OF INTRODUCTION OF THE FORMULARY SYSTEM

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Key words: formulary system; local formulary; drugs; ABC/VEN-analysis; index of utility; pharmacotherapeutic commission

The growth of expenses on drug supply in healthcare requires effective methods for their analysis in the specific healthcare institutions. On the example of a conditional healthcare institution an integrated ABC/VEN-analysis of the expenses on the drug supply for the year has been conducted using the index of utility for each drug. The results of the analysis performed will allow to optimize the purchase of drugs in accordance with the structure of diseases registered in the given healthcare institution, as well as the structure of the local formulary.

One of the main tasks of healthcare of any country is providing medical care of the adequate quality. According to experts of the World Health Organization, any country in the world does not have sufficient resources to healthcare. Even countries with high economic growth have to look for mechanisms to optimize the use of health budgets. In recent years particularly acute this problem arose in Ukraine.

The experience of a number of economically developed countries allows to note a significant role, which can be played by introduction of the formulary system based on the standards of treatment and the principles of evidence-based medicine in solving these problems. Introduction of the formulary system is the most effective means of economical use of budgetary funds allocated for the drug supply [3, 10, 11, 13, 14].

An important element of the quality management system providing availability, effectiveness and safety of drugs is conducting the ABC/VEN-analysis by healthcare institutions on using budgetary funds for the drug supply. To implement this task according to the requirements of the order of the Ministry of Public Health of Ukraine dated 22. 07. 2009 No. 529 "About creating a formulary system for the drug supply of healthcare institutions" the pharmacotherapeutic commission (PTC) is created by the order of the chief physician of a healthcare institution. An important task of such commission together with development and constant updating of the local formulary of drugs is providing physicians with information on the rational pharmacotherapy, as well as conducting the ABC-, VEN-analysis on using drugs, determination of rationality of their purchase in accordance with the priorities of pharmacotherapy of diseases

registered in healthcare institutions (statistical data form No.20) [4, 5, 14].

Conducting of the clinical and economic analysis is the most time consuming chain in the process of introduction of the formulary system. Despite the obvious perspective and the rapid development of this direction of research, its effectiveness is still rather low. One of the causes admitted by researchers is the lack of awareness of physicians concerning the issues of pharmacoeconomics and conservatism in prescribing drugs that is probably associated with this. Existing practical methods and guidelines are largely limited. For example, the ABC/VEN-analysis is mostly conducted by researchers while studying the system of using drugs for a certain nosological form of the disease, or separate groups of drugs, and it makes its implementation in practical work of healthcare institutions is quite time-consuming and insufficiently informative. When forming the local formulary there is virtually no experience in assessing the drug utility that would allow PTC to estimate objectively the degree of provision of patients with drugs, as well as the correspondence of the financial costs to the structure of diseases registered in the given healthcare institution [1, 2, 3, 8, 9].

The lack of specialists with the knowledge in the fields of economics, healthcare and pharmacy in most healthcare institutions, as well as computer technologies determine the need of development of the corresponding methodological recommendations [5, 6].

With introduction of the formulary system, in particular, creation of local formularies of drugs in healthcare institutions, and necessity of regular conducting of the ABC/VEN-analysis, the members of PTC must

master the method of its conducting with the use of computer technologies.

Based on the above the aim of our study was to practice the method of the integrated ABC/VEN-analysis of using drugs when forming and updating local formularies, as well as determination of rationality of their purchase and the correspondence to the structure of the patients admitted to hospital.

Materials and Methods

For the retrospective assessment of the rational use of the budgetary funds of a certain healthcare institution to purchase drugs such method of clinico-economic analysis as the ABC/VEN-analysis is used. Combination of the ABC and VEN analysis gives an idea about what drugs that are vital (V), essential (E); nonessential (N) take the most significant place in the structure of expenses of the healthcare institution for the drug supply.

The ABC-analysis (the Pareto principle) is a standard method used in the world when assessing current expenditures for purchase of drugs and their planning for the next year under the conditions of introduction of the formulary system.

The current modification of the VEN-analysis is assessment of the drug utility, i.e. degree of the need to use the given drug for pharmacotherapy of a specific disease, and it is extremely important, in particular, when deciding the reasonability of including the corresponding drug to the local formulary of the healthcare institution [1, 7].

In this case it is possible to determine the level of utility in the form of specific indexes VEN (UV, UE, UN) adding the code of a disease to them according to ICD-10. For example, according to the standardized protocol of medical care approved by the order of the Ministry of Public Health of Ukraine dated 19.03.07 No. 128 "On approval of clinical protocols of medical care in the specialty "Pulmonology" in drug therapy of community-acquired pneumonia (ICD-10 code – J15.9) the solution for infusion "Leflocin" will have the index of utility UV J15.9. This index can be further objectify if the level of efficiency and safety of drugs is added to it on the scale of levels of evidence. The index "0" refers to the utility of the drug, which is absent in clinical protocols of medical care of diseases registered in the given healthcare institution in the current State formulary of drugs, or in the List of Drugs that can be purchased by healthcare institutions fully or partially financed from the budget [12].

The benefits of implementing such analysis is obvious since it closely links the structure of morbidity registered in the healthcare institution (ICD-10 code), the corresponding protocols of medical care and drugs used in the drug therapy.

By definition, a local formulary should contain as many drugs as possible, which in relation to diseases registered in the particular healthcare institution must be referred to vital and essential drugs, and, therefore, have the index of utility (U_V) and (U_E), and only in extreme cases – to nonessential drugs (U_N).

It should be noted that at the beginning of the study (2012) the most common approach to development of the local formulary was as follows: all drugs used at that moment in the healthcare institution were considered a

basic formulary, which in the future should gradually be updated and improved according to the principles of the formulary system. That is, based on the results obtained, PTC of the healthcare institution planned to develop pharmaco-economically reasonable local formularies that would have to meet the requirements of normative legal documents. An important role in this process was given to the ABC/VEN-analysis [11].

In our research 398 healthcare institutions of the secondary and tertiary levels from the Dnipropetrovsk, Vinnytsia, Kharkiv, Kyiv and other regions of Ukraine took part, they developed their local formularies (LF) for 2013 based on the current of the fifth edition of the State formulary (SF). In order to update and improve LF for 2014 the ABC/VEN-analysis of the rational use of budgetary funds for the purchase of drugs was conducted upon completion of the period under review together with PTC of these healthcare institutions, and the appropriate recommendations concerning improvement of the structure of their purchase, as well as optimization of the content of LF were given.

To improve clarity of the process of conducting the integrated ABC/VEN-analysis with the use of computer technologies we consider it expedient to comment it on the example of one of the healthcare institutions in the Dnipropetrovsk region. The basic data are that in 2013 the healthcare institution spent the budgetary funds in the amount of 468371,66 UAH for purchasing 106 names of drugs (data from the local formulary and accounting documents).

The structure of diseases registered in the healthcare institution (statistical data form No.20 for 2013) according to ICD-10 codes is as follows: A00, A08, A04.9, G45, G90-99, I10-13, I20-25, I60, I63, I69, I69.4, I70.8, I177.6, I178, J00-99, J00-J06, J15.9, J18, J45, K00-K93, K26, K29, K30, K35.9, K 80, K81, K82, K85, K86, L00-L08, L50, M16-19, M42, M54, N 20, N30, R52.0, T36-50, T51, T79.4, T-98, etc.

All trade names of drugs purchased by the healthcare institution within a year were introduced indicating their amount and cost of purchase to the computer in a spreadsheet format with the help of Microsoft Office Excel programme. From the local formulary the data regarding the category of vital importance – V, E, N assigned to each trade name of the drug purchased for the budgetary funds were introduced (Fig.).

With the help of spreadsheet functions drugs were ranked in descending order of the cost for their purchase, the total cost of drugs actually purchased in 2013 was calculated, the expense percentage of the healthcare institution per each individual drug from the sum of the total cost for drug purchase was calculated, the so-called "cumulative percentage" was determined for each drug.

It was further determined which class of ABC should include each of the drugs purchased for the budgetary funds. Drugs, which cumulative percentage was $\leq 80\%$, were referred to category A; drugs with the cumulative percentage of $80\% \geq 95\%$ were referred to category B; and drugs with the cumulative percentage of $95\% \geq 100\%$ fell in the category C. Class ABC for each drug was determined using spreadsheets.

№ зп	Виробник	Торгова назва	Виробник на	Форма випуску	Дозування	Кількість в упаковці	Результати VEN аналізу	Кількість фактично закупленого кованого препарату у 2013 році (фактично)	Кількість фактично закупленого кованого препарату вартість фактично закупленого кованого ДІЗ ковані	Відсоток від загальних витрат	Категорія вен аналізу	ABC-клас	Результати ABC-VEN аналізу	
1	І	МІЛДРОКАРД	ТОВ "Ніко", м. Мазівець, Донецька обл., Україна	Р-н д/ін еск. ампл. 5,0 мг	100 мг/мл	№ 10	V	1151	151 105,83	32,26%	V	A	AV	
2	І	Л-лізину есцинат	АТ "Галичфарм"	Р-н д/ін еск. ампл. 5,0 мг	0,1%	№ 10	V	332	35 847,32	7,65%	V	A	AV	
3	ІІ	АКТОВЕГІН	"Nucomed Austria GmbH" для "Nucomed", Австрія	р-н для ін'єкцій 5,0 мг	40 мг/мл	№ 5	V	199	28 971,82	6,19%	V	A	AV	
4	І	НАТРІЮ ХЛОРИД	ТОВ фірма "Новофарм-Біосинтез", м. Новоград-Волинський, Україна	Р-н д/інф. по 200мл у пл.	9мл/мл	№1	V	5892	27 583,95	5,89%	V	A	AV	
5	І	ПІОЦЕТАМ	АТ "Галичфарм", м. Львів, Україна	р-н для ін'єкцій 5,0 мг	100 мг/25 мг	№ 10	V	432	16 201,96	3,46%	V	A	AV	
6	І	ПІОТРИАЗОЛІН	АТ "Галичфарм", м. Львів, Україна	Р-н д/ін еск. ампл. по 4,0мл	25 мг/мл	№ 10	V	205	15 496,25	3,31%	V	A	AV	
7	І	ВІПАКСОН	ПАТ "Фармак", м. Київ, Україна	Р-н д/ін еск. ампл. 2,0 мг	---	№5	E	360	15 030,00	3,21%	E	A	AE	
8	І	НАТРІЮ ХЛОРИД	ТОВ "Ніко", м. Мазівець, Донецька обл., Україна	Р-н д/інф. по 200мл у пл.	0,90%	№1	V	2400	12 548,00	2,68%	V	A	AV	
9	ІІ	ЦЕРЕБРОЛІЗІН	EBEWE Pharma Ges.m.b.H.NfG KG, Австрія	р-н для ін'єкцій 5,0 мг	215,2 мг/мл	№ 5	E	57	11 759,10	2,51%	E	A	AE	
10	ІІ	ЦЕРАКСОН	"Ferrer Internacional S.A.", Іспанія	р-н для ін'єкцій 4,0 мг	500 мг	№ 5	V	60	10 961,08	2,34%	V	A	AV	
11	ІІ	ЛУЦЕТАМ®	EGIS Pharmaceuticals PLC, Угорщина	Р-н д/ін еск. ампл. 5,0 мг	200 мг/мл	№ 10	V	220	9 856,00	2,10%	V	A	AV	
12	І	НИКОТИНОВА КИСЛОТА-ДАРНИЦЯ	Пр.АТ "Фармацевтична фірма "Дарниця", Україна	Р-н д/інск. по 1мл в ампл. у кор.	10 мг/мл	№10	E	780	9 543,00	2,04%	E	A	AE	
110	ВСЬОГО									468 371,66				

Fig. The screenshot of the table with the results of ABC/VEN-analysis for all trade names of the drugs purchased by the healthcare institution for budgetary funds.

With the help of spreadsheet functions the results of the ABC/VEN-analysis for all trade names of drugs were obtained (column 14).

Results and Discussion

The results of the ABC/VEN-analysis conducted were listed in Tab. 1 for clarity.

Then for the first time in the practice of the formulary system introduction the index of utility for the drugs purchased was determined with addition of the appropriate codes of diseases in each drug trade name registered in healthcare institutions in according to ICD-10. Ideally, certain diseases codes must correspond to all drugs used in pharmacotherapy of diseases registered in healthcare institutions and included into the local formulary.

The results of the ABC/VEN-analysis with the index of utility determined for each drug purchased for the budgetary funds were listed in Tab. 2.

According to the results of the integrated ABC/VEN-analysis with determination of the level of utility of each drug the following conclusions and recommendations were made by PTC of the healthcare institution:

- Of 106 names of drugs purchased by the healthcare institution, 16 names of drugs, such as mildrocard,

l-lysine aescinat, actovegin, etc., are absent in the 5-th edition of the State formulary, and therefore, it is inexpedient to classify them as vital (V) and essential (E) drugs. The share of such drugs was 68.66% of the total expenditures;

- The approaches to the use of drugs of the vital (V) category, which should be given priority when purchasing, should be revised. 83 Drugs were referred to this category, their share in the total budget expenditures was 86.03%. Among them 12 names of drugs (61.20%) are absent in the current State formulary; it is no reason to assign 29 names of drugs (9.44%), such as pentoxifylline, sermion, mucolvan, asparcam, etc., to the category (V).
- The approaches to the use of drugs of the essential drug category (E) should be revised. 22 Drugs were referred to this category, their share was 13.95%. Among them 4 names of drugs (7.46%) are absent in the current State formulary, 8 names of drugs (1.7%), such as ethyl, barboval, ascorbic acid, etc., are not advisable to classify as (E).
- The question concerning increase of the level of the drug supply of the patients with diseases registered in healthcare institutions (statistical data form No. 20

Table 1

Distribution of drugs by the categories of vital importance and their place in the structure of expenses of budgetary funds on drug supply

The share of drugs ranged in classes A, B, C, %	The share of drugs of each category V; E; N, %		
	In 2013		
	V	E	N
	86.03%	13.96%	0.01%
A	80.09%	AV – 70.60%	AE – 9.49%
B	15.06%	BV – 11.59%	BE – 3.47%
C	4.84%	CV – 3.84%	CE – 0.99%
			AN – 0.00%
			BN – 0.00%
			CN – 0.01%

Table 2

Generalized results of the integrated ABC/VEN-analysis with the index of utility for each drug

No.	Trade name of the drug, how supplied, dose, package amount	Index of utility of a drug, U	The percentage of total expenditure, %	Conclusions
Group (AV) according to the results of the ABC/VEN-analysis				
1	Mildrocard, sol. f/inj., 5.0 ml amp., 100 mg/ml, No.10	U _v 120-125; U _v 160-169	32.26%	Absent in the SPhU, the 5-th ed., therefore it should have the index of utility "0", review the feasibility of using
2	L-Lysine Aescinat, sol. f/inj., 5.0 ml amp., 0.001, No.10	U _v 188; U _v 170.8; U _v 177.6	7.65%	Absent in the SPhU, the 5-th ed., therefore it should have the index of utility "0", review the feasibility of using
3	Actovegin, sol. f/inj., 5.0 ml amp., 40 mg/ml, No.5	U _v 110-13, U _v G45, U _v G90-99	6.19%	Absent in the SPhU, the 5-th ed., therefore it should have the index of utility "0", review the feasibility of using
4	Sodium chloride, sol. f/inj., 200 ml in vial, 9 mg/ml, No.1	U _v A0.8, U _v T79.4	5.89%	No comments
			
	Total of the group (AV)		70.60%	
and so on				

for 2013) should be considered according to ICD-10 codes: J15.9, J18, K29, K30, N30, etc.

Because of publication of the sixth edition of the State formulary approved by the order of the Ministry of Public Health of Ukraine dated 08.04.2014 No.252 "On approval of the sixth edition of the State formulary of drugs and providing its availability", and considering the comments received regarding the structure of the drug purchase in 2013, the PTC of healthcare institutions participating in the research made the appropriate changes to the plan of purchasing drugs for budgetary funds for 2014, as well as revised the content of the current local formularies with the purpose of correcting the LF project and the plan of the drug purchase for 2015. The results of the integrated ABC/VEN-analysis of planned indicators of the drug purchase in 2015 indicate qualitative positive changes in the structure of purchasing of categories (V) and (E), as well as in assessing the utility of drugs included to the local formulary.

Summarizing the results of the integrated ABC/VEN-analysis conducted by us with the participation of PTC of healthcare institutions according to the results of drug purchasing in 2013 a number of disadvantages that are common practically for all healthcare institutions may be noted in the process of the local formularies updating and purchasing drugs for budgetary funds.

Obvious signs of irrational use of budgetary funds are as follows:

- the presence of drugs categorized to N (AN) in class A, but they should not be in this class;
- insufficient presence of drugs of V (AV) category in class A, which should be used for treating diseases with a significant specific weight in the structure of diseases registered in healthcare institutions;
- the index of utility of some drugs equals "0"; it indicates the absence of the drug in the current State formulary or in unified clinical protocols of medical care for diseases registered in the given healthcare institution.

Therefore, the results of the integrated ABC/VEN-analysis allow to improve the purchasing policy of essential drugs (AV; AE) under the conditions of the total budget deficit, reduce the use of ineffective drugs (AN; BN) and form an effective local formulary.

CONCLUSIONS

The use of ABC/VEN-analysis under the conditions of introduction of the formulary system is extremely important in order to optimize costs for the drug supply of the diagnostic and treatment process and improvement of the efficiency of pharmacotherapy. Its application in the practical work of healthcare institutions can be the real basis for determination of priorities to optimize the supply campaign.

An essential addition of the ABC/VEN-analysis that allows to assess objectively the degree of necessity of using various drugs registered in a healthcare institution for pharmacotherapy of specific diseases is assessment of its utility (U_v, U_e, U_n). The results of the integrated ABC/VEN-analysis with determination of the level of the index of utility of each drug indicate its effectiveness to control the rational use of budgetary funds on the drug supply.

Conclusions according to the results of the integrated ABC/VEN-analysis will allow to optimize the structure of the local formulary of the healthcare institution, provide priority funding for purchasing vital drugs, prepare a substantiated request for the next period of the drug purchase, take appropriate management decisions by the healthcare institution concerning the further implementation of the formulary system principles.

The annual integrated ABC/VEN-analysis conducted by PTC with determination of the level of utility of each drug included into the local formulary allows to identify routinely the problems existing in the healthcare institution in relation to pharmacotherapy of diseases, thereby significantly increasing the level of medical care and fully implementing the medical, pharmacological, economic, professional, educational and informational functions of the formulary system.

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ОЦІНКА РАЦІОНАЛЬНОСТІ ВИКОРИСТАННЯ ЗАКЛАДАМИ ОХОРОНИ ЗДОРОВ'Я БЮДЖЕТНИХ КОШТІВ НА ЛІКАРСЬКЕ ЗАБЕЗПЕЧЕННЯ В УМОВАХ ВПРОВАДЖЕННЯ ФОРМУЛЯРНОЇ СИСТЕМИ**А.В.Кабачна, Е.В.Шелкова, О.Г.Кабачний****Ключові слова:** формулярна система; локальний формуляр; лікарські засоби; АВС/VEN-аналіз; індекс утилітарності; фармакотерапевтична комісія

Зростання витрат на лікарське забезпечення в охороні здоров'я вимагає ефективних методів їх аналізу в конкретних закладах охорони здоров'я. На прикладі умовної установи охорони здоров'я проведено інтегрований АВС / VEN-аналіз витрат на лікарське забезпечення за рік з використанням індексу утилітарності кожного лікарського засобу. Результати проведеного аналізу дозволять оптимізувати закупівлю лікарських засобів відповідно до структури захворювань, які реєструються в даному лікувальному закладі, та оптимізувати структуру локального формуляра.

ОЦЕНКА РАЦИОНАЛЬНОСТИ ИСПОЛЬЗОВАНИЯ УЧРЕЖДЕНИЯМИ ЗДРАВООХРАНЕНИЯ БЮДЖЕТНЫХ СРЕДСТВ НА ЛЕКАРСТВЕННОЕ ОБЕСПЕЧЕНИЕ В УСЛОВИЯХ ВНЕДРЕНИЯ ФОРМУЛЯРНОЙ СИСТЕМЫ**А.В.Кабачная, Э.В.Шелковая, А.Г.Кабачный****Ключевые слова:** формулярная система; локальный формуляр; лекарственные средства; АВС/VEN-анализ; индекс утилитарности; фармакотерапевтическая комиссия

Рост расходов на лекарственное обеспечение в здравоохранении требует эффективных методов их анализа в конкретных учреждениях здравоохранения. На примере условного учреждения здравоохранения проведен интегрированный АВС/VEN-анализ расходов на лекарственное обеспечение за год с использованием индекса утилитарности каждого лекарственного средства. Результаты проведенного анализа позволяют оптимизировать закупку лекарственных средств в соответствии со структурой заболеваний, которые регистрируются в данном лечебном учреждении, и оптимизировать структуру локального формуляра.