The study of the state of pharmaceutical provision for patients with cardiovascular diseases using ABC- and VEN-analyses

**Aim.** To assess the state of pharmaceutical provision for patients with cardiovascular diseases (CVD) using ABC, VEN and complex ABC/VEN analyses.

**Materials and methods.** The study was performed according to the data of the medical records of outpatients who were registered in the Public Health Institution (PSI) “Kharkiv City Clinical Hospital No. 27”. The methods of ABC, VEN and complex ABC/VEN analysis were used.

**Results and discussion.** The results of the study using the ABC-analysis method allowed us to determine that the largest number of drugs was in the group C, which included 25 drugs, or 51.02 % of the total number of prescriptions. During the VEN analysis it was found that the vast majority of drugs (41 drugs) belong to the group V – vital essential medicines. The complex ABC/VEN analysis showed that drugs with the A/V status (the most costly and vital essential medicines) had the highest percentage (32.20 %) of the total consumption. It should be separately noted that the A/N group (the most costly and nonessential medicines) took the second position by percentage after the A/V group. A high percentage (31.05 %) in the A/N group is explained by the fact that the group includes the drug Magnikor, which has the highest frequency of prescription although this drug is not included in the National List of Essential Medicines (NLEM) and in the “Available medicines” program.

**Conclusions.** The results of the studies of the state of pharmaceutical care for patients with CVD make it possible to draw attention to the urgency of the problems of drug availability to the population, namely expanding the list of medicines that are reimbursed in the framework of the government programs, in particular by including the drug Magnikor in the “Available medicines” program.

**Key words:** complex ABC/VEN analysis; medicines; cardiovascular diseases; government program; pharmacoconomics

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Исследование состояния фармацевтического обеспечения больных сердечно-сосудистыми заболеваниями с помощью ABC- и VEN-анализов

Цель работы – оценка состояния фармацевтического обеспечения больных сердечно-сосудистыми заболеваниями (ССЗ) с помощью ABC, VEN и комплексного ABC/VEN анализов.

Материалы и методы. Исследование проведено по данным медицинских карт амбулаторных больных, состоявших на учете в Комунальном учреждении здравоохранения (КУЗ) «Харьковская городская клиническая больница № 27». Методами были выбраны: ABC-, VEN- и комплексный ABC/VEN-анализ.

Результаты и их обсуждение. Результаты исследования метода ABC-анализа позволили установить, что наибольшее количество препаратов включало в себя группа А, в которую было включено 25 лекарственных средств (ЛС) или 51,02 % от общего количества назначений препаратов. При проведении VEN-анализа было установлено, что подавляющее большинство ЛС относится к группе V – жизненно необходимые – 41 препарат. Комплексный ABC/VEN-анализ показал, что препараты со статусом А/V (наиболее затратные и жизненно необходимые препараты) имели наибольший удельный вес 32,20 % от общего потребления. Отдельно следует отметить, что группа А/Н (наиболее затратные и второстепенные ЛС) занимала вторую позицию по удельному весу после группы А/В. Высокий процент 31,05 % в группе А/Н объясняется тем, что в группу попало ЛС Магникор, которое имеет наибольшую частоту врачебных назначений, хотя данный препарат не включен в Национальный перечень основных лекарственных средств и в программу «Доступные лекарства».

Выводы. Результаты проведенных исследований состояния фармацевтической помощи больным ССЗ позволяют подчеркнуть актуальность проблем доступности лекарств для населения, а именно расширения перечня препаратов, которые реимбурсируются в рамках правительственных программ, в частности, включением в программу «Доступные лекарства» препарат Магникор.

Ключевые слова: комплексный ABC/VEN-анализ; лекарственные средства; сердечно-сосудистые заболевания; Правительственная программа; фармакоэкономика

Cardiovascular diseases (CVD) are one of the most common diseases of our time. Thus, according to the data of the European Cardiovascular Statistics over the past ten years, the prevalence of CVD in the world and in Ukraine has increased almost twice, and this situation leads to a number of socio-demographic and medical problems [1]. Because of the economic crisis, high inflation and instability of foreign exchange rates, high pharmacotherapy of CVD and low solvency of patients the rational and effective use of drugs in the healthcare system and pharmacy in the conditions of implementation of the government programs concerning the availability of drugs becomes relevant.

The aim of the work was to study the state of pharmaceutical provision for patients with CVD using ABC, VEN and complex ABC/VEN analyses.

Materials and methods
The study was performed according to the data of the medical records of outpatients who were registered in the Public Health Institution (PSI) “Kharkiv City Clinical Hospital No. 27”; the drug prescribing was within the framework of the “Available medicines” government program; the National List of Essential Medicines (NLEM), the Registry of wholesale prices for drugs [2, 3, 4]. The following methods were chosen. The ABC-analysis method providing the ranking of drugs into three groups depending on size of expenditures by their cost price: A – (spent approximately 80 % of the total costs for pharmacotherapy), B – (spent approximately 15 % of the costs) and C – (spent approximately 5 % of the costs). The VEN analysis is based on distribution of drugs depending on their degree of importance into V – vital essential, E– essential and N – nonessential medicines. The ABC/VEN analysis provides sufficient objectivity of distribution of costs for pharmaceutical support of patients and helps to optimize the costs of public procurement of drugs [5].

Results and discussion At the initial stage of the study the analysis of 1190 medical records of outpatients with CVD who were registered in the PSI “Kharkiv City Clinical Hospital No. 27” was performed. In total, 43 drugs were prescribed by the international nonproprietary name (INN) used in the “Available medicines” program taking into account the product forms and dosage and 6 drugs by the trade name (TN) that were not included in this program. At the next stage of the study was ABC analysis of three groups. Thus, the group A included 10 drugs (20.41 % of the total number of drug prescriptions), there were 14 drugs (28.57 %) in the group B and 25 drugs (51.02 %) in the group C. The results are presented in Tab. 1.
At the third stage the VEN analysis by a formal sign was performed, i. e. distribution of drugs into groups based on the following normative legal documents: the resolution of the Cabinet of Ministers of Ukraine dated 25.03.2009 No. 333 “Some issues of state regulation of prices for medicines and medical products” and the resolution of the Cabinet of Ministers of Ukraine dated 09.11.2016 No. 863 “On introduction of reimbursement of the cost of drugs”. Therefore, drugs included in NLEM and in the “Available medicines” program were referred to the group V – vital essential medicines, drugs included only in NLEM comprised the group E – essential, while drugs that were not included in all of the above-mentioned regulatory documents were referred to the group N – nonessential medicines.
At the final stage the complex ABC / VEN analysis of drug prescriptions was performed. The results are presented in Tab. 2 [5, 6].
Table 1

The results of ABC- and VEN-analyses of drug consumption in patients with CVD (by the experimental sample)

| The name of a drug | Dose | Price per package, UAH | The number of mg per a course of treatment – 30 days | The cost of treatment (30 days), UAH | The frequency of drug prescriptions | Drug consumption, UAH | Percentage, % | The ABC/VEN group |
|-------------------|------|------------------------|-----------------------------------------------|--------------------------------------|-----------------------------------|-----------------------|--------------|------------------|
| Actovegin         | 200 mg, No.50 | 579,90 | 6000 | 347,94 | 90 | 31314,60 | 10.08 | A/N |
| Clopidogrel       | 75 mg, No.90  | 228,99 | 2250 | 76,33 | 413 | 31524,29 | 10.14 | A/V |
| Betahistine       | 24 mg, No.20   | 160,87 | 720 | 241,31 | 93 | 22441,37 | 7.22 | A/N |
| Magnikor          | 75 mg, No.100 | 62,03  | 2250 | 18,61 | 159 | 13028,91 | 4.19 | A/N |
| Simvastatin       | 40 mg, No.28  | 149,13 | 1200 | 66,96 | 202 | 13525,92 | 4.35 | A/N |
| Valsacor          | 80 mg, No.30  | 160,87 | 720 | 18,61 | 159 | 13028,91 | 4.19 | A/N |
| Elanapril         | 20 mg, No.20   | 12,45  | 600 | 18,68 | 159 | 13028,91 | 4.19 | A/N |
| Magnikor          | 75 mg, No.100 | 62,03  | 2250 | 18,61 | 159 | 13028,91 | 4.19 | A/N |
| Simvastatin       | 40 mg, No.28  | 149,13 | 1200 | 66,96 | 202 | 13525,92 | 4.35 | A/N |
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| Magnikor          | 75 mg, No.100 | 62,03  | 2250 | 18,61 | 159 | 13028,91 | 4.19 | A/N |
| Simvastatin       | 40 mg, No.28  | 149,13 | 1200 | 66,96 | 202 | 13525,92 | 4.35 | A/N |
According to the results of the analysis, it was found that the highest percentage of drug consumption was observed in the group V – 68.18% of the total number of prescriptions, in the group E it was 0.45% and in the group N – 31.37%, respectively. Drugs with the А/V status were 32.20% of the total consumption, drugs with the А/E status were absent, and with the А/N status were 31.05%. In the group В and С the corresponding indicators were: В/V – 23.65%, the groups В/E and В/N were absent, С/V – 12.33%, С/E – 0.45%, С/N – 0.31%.

It was found that in the pharmaceutical provision of patients with CVD a significant part of the cost was in the group А (the most expensive drugs) and the V group (vital essential medicines).

It should also be noted that a high percentage of consumption in the А/N group was characteristic due to the drug Magnikor with the highest frequency of prescription although this drug was not included in NLEM and in the “Available medicines” program. This fact indicates the feasibility of inclusion of the drug Magnikor in further participation of the government programs to improve drug availability for patients with CVD [7, 8].

CONCLUSIONS
1. According to the data of the ABC-analysis of drug prescriptions to patients with CVD it has been found that the group C has the largest number of drugs (25 drugs, or 51.02% of the total number of drug prescriptions) and the total consumption is 40681.03 UAH or 13.09%.

2. The indicators of the VEN analysis calculated by a formal sign determine that the vast majority of drugs belong to the group V – vital essential medicines (41 drugs or 68.18% of the total number of drug prescriptions); it is 211875.0 UAH of drug consumption.

3. The complex ABC/VEN analysis of drug prescriptions has shown that drugs with the A/V status (the most costly and vital essential medicines) have the highest percentage (32.20%) of the total consumption of drugs. A high percentage (31.05%) in the A/N group is explained by the fact that the group includes the drug Magnikor, which has the highest frequency of prescription although this drug is not included in NLEM and the “Available medicines” program.

4. The results of the studies of the state of pharmaceutical care for patients with CVD make it possible to draw attention to the urgency of improving the lists of medicines that are reimbursed in the framework of the government programs concerning drug availability to the population, in particular by including the drug Magnikor in the “Available medicines” program.

Conflict of Interests: authors have no conflict of interests to declare.

REFERENCES
1. European Cardiovascular Disease Statistics 2017 [Electronic resource]. – Access mode: http://www.ehnheart.org/cvd-statistics.html
2. Доступні ліки [Електронний ресурс]. – Режим доступу : http://liky.gov.ua/
3. Офіційний сайт Кабінету міністрів України [Електронний ресурс]. – Режим доступу: https://www.kmu.gov.ua/ua
4. Реєстр оптово-відпускних цін на лікарські засоби МОЗ України [Електронний ресурс]. – Режим доступу: http://www.moz.gov.ua/ua/portfolio/register_prices_drugs/.
5. Бєдітко, Н. В. Інтегрований частотний/АВС/VEN-аналіз продажу лікарських засобів в аптекі як віддзеркалення доцільності амбулаторної фармакотерапії хворих з серцево-судинними захворюваннями / Н. В. Бєдітко, І. В. Чинуш // Управління, економіка та забезпечення якості в фармації. – 2012. – № 4 (24). – С. 54–59.
6. Воробьев, П. А. Клинико-экономический анализ в медицинской организации. Практическое руководство для лиц, принимаю-
щих решения / П. А. Воробьев // Рациональная фармакотерапия. – 2008. – № 1 (10). – С. 5–14.

7. Оцінка клінічної та економічної доцільності використання лікарських засобів у лікувально–профілактичному закладі (су-
провід формульної системи) : метод. рек. / А. М. Морозов, Л. В. Яковлєва, Н. В. Бездітко та ін. – К., 2013. – 36 с.

8. Guidelines on Medication Cost Management Strategies for Hospitals and Health Systems / American Society of Health – System Pharma-
cists // ASHP. – 2008. – Vol. 65. – P. 1368–1384. https://doi.org/10.2146/ajhp080021

REFERENCES

1. European Cardiovascular Disease Statistics.(2017). ehnheart.org. Retrieved from: http://www.ehnheart.org/cvd-statistics.html

2. Dostupniliky. [Available medicines]. liky.gov.ua. Retrieved from: http://liky.gov.ua/

3. Reiestr optovoi-vidpusknykh tsinnalikarskizasoby MOZ Ukrainy. moz.gov.ua. Retrieved from: http://www.moz.gov.ua/ua/portal/registr_pointer_drugs/

4. Ofitsiinyi sait Kabinetu ministriv Ukrainy. kmu.gov.ua. Retrieved from: https://www.kmu.gov.ua/ua

5. Бездітко, Н. В., Чунуш, І. В. (2012). Upravlinnia, ekonomika ta zabezpechennia yakosti v farmatsii, 4 (24), 54–59.

6. Vorobev, P.A. (2008). Racionalnaia farmakoterapiia, 1 (10), 5–14.

7. Morozov, A. M., Yakovleva, L. V., Bездітко, Н. В., Mishchenko, O. Ya., Stepanenko, A. V., Zimenkovslyi, A. B., Parii, V. D., Chy-
nush, I. V. (2013). Otsinka klinichnoi ta ekonomichnoi dotsilnosti vykorystannia likarskykh zasobiv u likuvalno–profilaktychnomu zak-
lad (suprovod formalniarnoi systemy): metodychni rekomendatsii. Kiev, 36.

8. ASHP Guidelines on Medication Cost Management Strategies for Hospitals and Health Systems. (2008). American Journal of Health-
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