

**Matushchak M.R.**

*Assistant, Department of Pharmaceutical Botany and Pharmacognosy, Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», 40 Kochubey str., apt. 14, Chernivtsi, Ukraine, 58003 matushakmarta@gmail.com*

**Horoshko O.M.**

*Associate Professor, Department of Pharmaceutical Botany and Pharmacognosy, Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi*

**Zakharchuk O.I.**

*Professor, Chief of the Department of Pharmaceutical Botany and Pharmacognosy, Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi*

**Ezhned M.A.**

*Assistant, Department of Pharmaceutical Botany and Pharmacognosy, Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi*

**Palamar A.O.**

*Assistant, Department of Pharmacy, Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Chernivtsi*

**Skrynchuk O.Ya.**

*Lecturer, BSMU College, Chernivtsi*

## ANALYSIS OF PHARMACEUTICAL SUPPLY OF PATIENTS SUFFERING FROM GASTROESOPHAGEAL REFLUX DISEASE

**Abstract** *Gastroesophageal reflux disease is an urgent issue of current gastroenterology as it results in a number of complications. Therefore, the objective of the work was to improve the quality of pharmacotherapy of patients suffering from gastroesophageal reflux disease by means of making pharmacoeconomic analysis of the administration of proton pump inhibitors and propulsantes in order to improve the order of formation of a local card of therapeutic-preventive establishments. According to the results of the analysis the therapeutic regimen “Nolpaza+Itomed” from the group of “E” class was found to be the most economically available.*

**Key words:** *gastroesophageal reflux disease, pharmacoeconomic analysis, cost-benefits.*

**Introduction.** In the era of development of fast food people are not used to consider heartburn as a sign of some serious disease. Unpleasant sensations occurring in case of overeating or excessive intake of certain foods are eliminated by antacid means, and meals can be continued. Such a superficial attitude to heartburn is explained by its occurrence among practically healthy people. Though, chronic relapsing disease caused by disorders of the motor-evacuation function of the gastroesophageal area with spontaneous or regularly repeated reflux of the gastric or duodenal content into the esophagus leads to the damage of the esophageal mucosa. The World Organization of Gastroenterology recognized gastroesophageal reflux disease (GERD) as a disease of the XXI century involving from 20 to 50% of the population from different countries of the world. GERD is a leading cause of decreased quality of life, ability to work and development of

various complications [1]. Such complications as peptic ulcers, esophageal strictures, Barrett esophagus, esophageal adenocarcinoma and others can develop [2, 3].

In Ukraine GERD became statistically registered since 2009 and now it constitutes 10 cases per 1000 of population [4]. According to the survey GERD occurrence among the organized adult population is on an average 30,0%, but the number of people suffering from heartburn increases both among men and women similarly. Occurrence of GERD increases with advancing age of the respondents resulting in changes of the structure in clinical manifestation of the disease and domination of extra-esophageal signs of the disease [3].

GERD is an important issue of current gastroenterology. Therefore investigation of the pharmaceutical market concerning supply of patients suffering from GERD with appropriate

medicines remains urgent.

**Objective** of the work was to make pharmaco-economic analysis of pharmaceutical supply of GERD patients for further application of the obtained results in elaboration of organization-economic measures concerning increasing availability of medical and pharmaceutical aid given for a determined category of patients.

**Materials and methods.** Methodology of pharmaco-economic analysis assumes mutual use of retrospective analyses by the findings of case histories: analysis of frequency of medical indications and their ranking according to the degree of their value (Vital-Essential-Non-essential-analysis – VEN-analysis).

The study was conducted on the basis of 120 medical cards of hospital patients and treatment indication sheets of a therapeutic institution in the town of Chernivtsi.

**Results.** For the selection of medicines and making pharmaco-economic analysis concerning “cost-benefits” in the process of pharmaceutical supply of GERD patients we have made ABC-analysis of trade names of medicines using Pareto principle according to the amount of costs for their use.

By the results of the analyzed case histories 227 medical preparations were prescribed in 2018. General costs were 616478,25 hrn. (Fig. 1). The group A included 32 medicines, and a part of costs spent for them constituted 80,11% (493860,73 hrn.) of the total sum, the group B included 71 medicines constituting 15,02% (92595,03 hrn.), and the group C – 124 medicines – 4,84% (29837,55 hrn.).

The analysis of a part of these groups from the total range of medicines indicated (Fig.1)

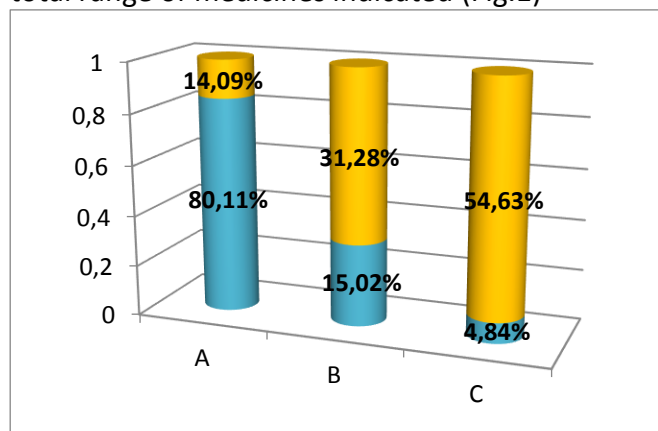


Fig. 1. ABC-rating of distribution of costs spent on medicines

determined the following: the group A constituted 14,09%, the group B – 31,28% and the group C – 54,63%.

For making VEN-analysis a comparison standard was the State Register of Medical Preparations of the 10<sup>th</sup> issue dated 10.05.2018. A numerical advantage of medicines from the category N (secondary) was found in the therapeutic regimens – 181 medicines. The group A included 3 vital («V») drugs (9,38%), while from the group B the medicines with V index were 6 in number (8,45%), and from the group C – 8 drugs (6,45%). The class «E» (essential) of medical preparations from the group A included 7 drugs (21,87%), and from the groups B and C – 9 (12,68%) and 13 (10,48%) respectively, that totally constituted 29 medicines. The class «N» of the secondary medicines from the group A included 22 medicines (68,75 %), 56 (78,87%) – group B and 103 medicines (83,07%) – group C.

The results of the conducted VEN-analysis found that the most numerous group was the one of class «E» including the medicines from the protocol of GERD treatment.

According to the protocol of GERD treatment such groups of medicines as proton pump inhibitors (PPI) and peristalsis stimulators are preferred mainly.

We have reviewed the pharmaceutical market of PPI and peristalsis stimulators in Ukraine in 2018 (Table 1). The State Register of Medical Preparations of Ukraine of the 10<sup>th</sup> issue recommends for the treatment of GERD 6 international generic names of PPI including 140 names of drugs: omeprazole, pantoprazole, lansoprazole, rabeprazole, esomeprazole and dexlansoprazole. On the IV quarter of 2018 the pharmaceutical market of Ukraine concerning PPI group was mostly formed at the expense of medicines produced abroad (86,43 %), and domestic production constituted only 13,57%.

A retail segment of the pharmaceutical market of the peristalsis stimulators is presented by 35 medicines included in 4 international generic names: metoclopramide, domperidone, itopride hydrochloride and mosapride. Among them a considerable part belongs to the medicines of domestic production (60%), India – 14,28%, European countries – 20,00%, Canada and Japan – 5,72% only.

Table 1

**Pharmaceutical market of proton pump inhibitors and peristalsis stimulators in 2018**

ATC-code	INN	Amount of names	Amount of producers	Ratio of domestic/import drugs
A02BC01	omeprazole	22	30	7/23
A02BC02	pantoprazole	27	63	5/58
A02BC03	lansoprazole	3	6	1/5
A02BC04	rabeprazole	9	15	3/12
A02BC05	esomeprazole	11	25	3/22
A02BC06	dexlansoprazole	1	1	-/1
A03FA01	metoclopramide	7	10	8/2
A03FA03	domperidone	13	21	13/8
A03FA07	itopride	1	1	-/1
A03FA09	mosapride	3	3	-/3

The pharmaco-economic analysis “cost-benefits” was made in order to determine the most available combination of medicines from these groups. By the results of the analyzed treatment sheets concerning treatment of hospital patients we have chosen several schemes of pharmacotherapy of GERD patients, namely: «Esolong+Itomed», «Esolong+Motoricum», «Nolpasa+Itomed» and «Nolpasa+Motoricum». The data concerning the cost (minimal, mean and maximal) of blockers H<sup>+</sup>/K<sup>+</sup>-ATPase and peristalsis stimulators (in hryvnas) were taken from the pharmacies of different forms of property in the town of Chernivtsi.

Having compared single, daily, and course expenses spent on pharmacotherapy of GERD patients, we have noticed that their “cost-benefits” index in anti-reflux treatment of patients who received anti-secretory drug from the group of blockers of H<sup>+</sup>/K<sup>+</sup>-ATPase – Esolong or Nolpasa and peristalsis stimulator – Itomed or Motoricum (Table 2), was the most effective in the combinations Esolong+Itomed and Nolpasa+Itomed. At the same time, the cost of daily treatment by the drugs is practically similar, but the cost of a course treatment by the scheme «Esolong+Itomed» is more expensive than the cost of pharmacotherapy «Nolpasa+Itomed».

Table 2

**Generalized indices of «cost-benefits» schemes of pharmacotherapy of GERD patients**

Pharmacotherapy scheme	Cost of a dose, hrn.			Index of efficacy	«Cost-benefits» index
	single	daily	course		
Esolong+Itomed	18,25	33,75	472,51	0,88	305,91
Esolong+Motoricum	14,36	22,10	309,41	0,54	145,60
Nolpasa+Itomed	15,08	30,58	428,12	0,87	255,41
Nolpasa+Motoricum	11,19	18,93	265,02	0,57	128,40

**Discussion.** Therefore, according to the results of the conducted pharmaco-economic analysis of “minimization of loss”, the indication of Nolpasa+Itomed appeared to be more economically profitable.

**Conclusions:** 1. ABC-rating of medicines included into the pharmacotherapy schemes for GERD patients determined that the group A (expensive drugs) included 32 remedies constituting 14,09% out of the total amount of

drugs; the group B (an average price) – 71 medicines constituting 31,28%; the group C (of low cost) – 124 medicines constituting 54,63%.

2. According to the results of the conducted pharmaco-economic analysis of “minimization of loss”, the indication of Nolpasa+Itomed appeared to be more economically profitable (the price of the course of treatment was 428,12 hrn.).

**Prospects of further studies.** The results of the study will enable to improve the order of formation of a local register at a therapeutic-preventive establishment as well as the quality of pharmacotherapy of patients suffering from gastroesophageal reflux disease.

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