

## PHARMACOECONOMIC ANALYSIS OF TREATMENT OF PATIENTS WITH CYCVISCIDOSIS

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**Introduction.** Cystic fibrosis (CF) is an important medical-pharmaceutical and socio-economic problem both worldwide and in Ukraine. This is due to the early disability of patients, the need for constant long-term use of high-cost treatment regimens, active dispensary supervision. In European countries, due to effective treatment, there is a tendency to increase the life expectancy of patients with CF. To increase the availability of medical and pharmaceutical care to patients with CF in Ukraine in order to improve the duration and quality of life of patients, it is necessary to apply effective, safe and cost-effective treatment regimens.

**Aim.** Conduct a pharmacoeconomic analysis of treatment of patients with CF.

**Materials and methods.** For pharmacoeconomic analysis, the data of the Cochrane systematic review of the use of dornase alpha in the treatment of pulmonary exacerbations in CF were used. It was found that the inhalation of dornase alpha (2.5 mg 1 g/day) in adults and children older than 5 years, the absolute risk of pulmonary exacerbations in CF is 19.5%, placebo - 25.2%. That is, 195 patients per thousand patients with CF who took dornase alpha developed pulmonary exacerbations. At the same time, the frequency of exacerbations of the pulmonary system during treatment with dornase alpha per year is - 1.25, and placebo - 3.13. Therefore, taking into account the data of a systematic review in subsequent calculations was taken the period of use of dornase alpha in comparison with placebo in the treatment of pulmonary exacerbations in CF for 1 year.

In Ukraine, the process of providing medical and pharmaceutical care to patients with CF is specified in the unified clinical protocol (UCP) of primary, secondary (specialized) and tertiary (highly specialized) medical care: cystic fibrosis (order of the Ministry of Health of Ukraine from 15.07.2016 № 723). Based on the data of the Cochrane systematic review and UCP, a pharmacoeconomic evaluation of the schemes of treatment of pulmonary exacerbations in CF with dornase alpha (scheme №1) and without the use of dornase alpha (scheme №2) was performed. The study compared direct medical costs, namely the cost of treatment regimens and bed-days.

The cost of treatment of pulmonary exacerbations in CF was calculated on the basis of selected trade names of drugs and medical devices that had the lowest declared wholesale price as of 09/21/2021. Due to the fact that the dose of antibacterial therapy is calculated per kg of body weight of the patient we decided to conduct a pharmacoeconomic analysis separately for children aged 5 to 18 years and adults. According to the Order of the Ministry of Health of Ukraine dated 25.09.2013 № 829 planning and calculation of the need for drugs for antibacterial therapy is carried out taking into account the average body weight of the child (30 kg), and for adults (70 kg).

The cost of bed-days was also taken into account when calculating direct medical expenses. Due to the lack of official information on the cost of bed-days in public health facilities, prices in private medical centers were analyzed. It is established that the minimum cost of bed-days (average—14 days) in the hospital is 5650 UAH.

**Results and discussion.** According to the results of the pharmacoeconomic analysis, it was found that when using the scheme №1 in the treatment of pulmonary exacerbations in CF in children

aged 5 to 18 years and adult patients, the total amount of direct medical costs is 2.7 and 2.6 times higher than the scheme №2. Next, calculations of direct medical costs were performed taking into account the absolute risk of pulmonary exacerbations (%) and the frequency of exacerbations of the pulmonary system in patients per year. According to the UCP "Cystic Fibrosis" in Ukraine in 2020 there were 920 patients diagnosed with CF, of which 495 (70% of the total number of patients) are children aged 5 to 18 years and 212 patients are adults. Thus, in the case of the scheme №1 (alpha dornase) the number of children aged 5 to 18 years will be  $495 * 19.5\% = 97$  patients, and in the scheme №2 -  $495 * 25.2\% = 125$ . Similar calculations were performed for a group of adult patients with CF.

It is established that the most appropriate in the treatment of pulmonary exacerbations in CF of both children aged 5-18 years and adult patients is the use of scheme №1 (dornase alpha). Direct medical costs in children aged 5 to 18 years, taking into account the indicators of clinical effectiveness when using the scheme №2 by 20% higher than when using the scheme №1 (dornase alpha). At the same time, the direct medical costs of using the scheme №2 in adult patients are 24% higher than in the scheme №1 (dornase alpha). Thus, the application of the scheme №2 in children aged 5-18 years and adults requires additional direct medical costs of 10 million 234 thousand UAH. (UAH 6,777,355.45 + UAH 3,457,418.73). The results of the analysis convincingly prove the pharmacoeconomic advantages of the use of dornase alpha in the treatment of patients with CF, which will save public money, improve the quality of life of patients.

**Conclusions.** Thus, taking into account the medical, social and economic importance of organizing an effective model of pharmaceutical support for CF patients, the conducted pharmacoeconomic analysis allows to form a rational financial policy and promote the rights of CF patients to receive quality, effective medical and pharmaceutical care that meets modern UCP and international requirements. standards.