Impact of Empagliflozin in Reducing Hospitalization Rates in Type 2 Diabetes Mellitus Patients with Chronic Heart Failure

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Background

Type 2 diabetes mellitus patients (T2DM) with chronic heart failure (CHF) are at higher risk of hospitalization for HF, nonfatal myocardial infarction (NMI) and renal replacement therapy (RRT). The results of the EMPA-REG OUTCOME study presented convincing evidence that the use of empagliflozin in these patients can significantly reduce the frequency of such hospitalizations.

Objectives

The aim of this study was to compare the clinical and economic impact of empagliflozin in combination with standard of care (SoC) vs SoC in reducing the frequency of hospitalizations in T2DM patients with CHF.

Methods

All adult Russian T2DM patients with CHF were considered the target population totaling **106,988 people**. Data from the EMPA-REG OUTCOME trial[1,2] was employed to predict the number of cardiovascular and renal events that can be prevented using empagliflozin with SoC instead of placebo with SoC. The methodology described by Fleurence and Hollenbeak[3] was used to estimate the one-year occurrence probability. This analysis was conducted from the perspective of the Russian healthcare system and costs data was derived from Russian national sources. Exchange rate was: 1 USD = 73,50 Ruble.

Results

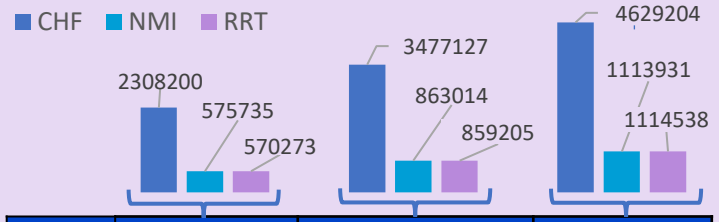
The modelling data indicates that relative to SoC, empagliflozin with SoC yielded fewer cardiovascular and renal-related hospitalizations. The use of empagliflozin with SoC in T2DM patients with CHF will allow to prevent an additional **4482** CHF-related hospitalizations, **2239** NMI-related hospitalizations and **961** RRT-related hospitalizations in 2022-2024.

Table 1. Results of a clinical prediction model

Cause of hospitalization	№ of hospitalizations					
	Empagliflozin + SoC			SoC		
	2022	**2023**	**2024**	**2022**	**2023**	**2024**
CHF	1935	2889	3834	2945	4387	5808
NMI	3234	4814	6371	3742	5563	7353
RRT	214	321	428	428	642	855

Significant health care budget savings can be achieved due to the decrease in the number of hospitalizations**: 3,454,208 USD in 2022, 5,199,346 USD in 2023, 6,857,673 USD in 2024**.

Figure 1. Distribution of potential health care budget savings by year.



Event	2022	2023	2024
CHF	$ 2 308 200	$ 3 477 127	$ 4 629 204
NMI	$ 575 735	$ 863 014	$ 1 113 931
RRT	$ 570 273	$ 859 205	$ 1 114 538

References

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2. Wanner C. et al. Empagliflozin and progression of kidney disease in type 2 diabetes //New England Journal of Medicine. – 2016. – T. 375. – №. 4. – C. 323-334.
3. Fleurence R. L., Hollenbeak C. S. Rates and probabilities in economic modelling //Pharmacoeconomics. – 2007. – T. 25. – №. 1. – C. 3-6.

CONCLUSIONS: This analysis suggests that adding empagliflozin to standard therapy in T2D patients with CHF may provide a more effective use of healthcare resources by preventing additional hospitalizations.