MEDICAL CENTER HOSPITAL
OF THE PRESIDENT'S AFFAIRS
ADMINISTRATION OF THE
REPUBLIC OF KAZAKHSTAN

COST-EFFECTIVENESS ANALYSIS OF USING KETOANALOGUES OF ESSENTIAL AMINOACIDS IN PATIENTS WITH CHRONIC KIDNEY DISEASE IN KAZAKHSTAN

Avdeyev A[1], Gulyaev A[2], Akhmedullin R[1]

[1] Medical Center Hospital of the President's Affairs Administration of the Republic of Kazakhstan, Astana, Kazakhstan
[2] Nazarbayev University, Astana, Kazakhstan
** Corresponding author. E-mail address:* ***avdeyev.andrey@yahoo.com***

OBJECTIVES: This study aims to assess the clinical and economic impact of ketoanalogues of essential aminoacids (Ketosteril) in the management of CKD in the context of the Kazakhstani healthcare system.

METHODS: Our analysis incorporated annual direct costs per patient in the management of CKD in adult patients comparing Ketosteril with a placebo.
We conducted an economic evaluation focusing on the cost-effectiveness and one-way sensitivity analyses up to 90%. The change in QALYs was used as the primary endpoint of measure.

RESULTS: The findings of the cost-effectiveness analysis unveiled a compelling cost-effectiveness advantage of Ketosteril over the placebo, in the CKD management. Ketosteril resulted in a better ratio of the main cost-effectiveness ratio (CER) parameters and a negative incremental cost-effectiveness ratio (ICER). Our findings were confirmed with the sensitivity analysis. **For the QALY, the CER was USD 3 218 versus USD 6 788 and the ICER was "–" USD 6 779.**

Table 1. Results of the Cost-effectiveness Analysis

Main parameters	Ketosteril group	Placebo group
Annual direct costs per patient	2 446.44	3 802.85
QALY	0.7603	0.5602
CER	3 217.73	6 788.38
ICER	**- 6 778.65**	
NNT	4.0	23.7
Costs to achieve NNT	9 785.76	90 127.51

1. de Vries EF, Rabelink TJ, van den Hout WB. Modelling the Cost-Effectiveness of Delaying End-Stage Renal Disease. Nephron. 2016;133(2):89-97.
2. Garneata L, Stancu A, Dragomir D, Stefan G, Mircescu G. Ketoanalogue-Supplemented Vegetarian Very Low-Protein Diet and CKD Progression. J Am Soc Nephrol. 2016 Jul;27(7):2164-76.
3. Yen CL, Fan PC, Lee CC, Kuo G, Tu KH, Chen JJ, Lee TH, Hsu HH, Tian YC, Chang CH. Advanced Chronic Kidney Disease with Low and Very Low GFR: Can a Low-Protein Diet Supplemented with Ketoanalogues Delay Dialysis? Nutrients. 2020 Oct 31;12(11):3358.

CONCLUSION: Our findings provide strong evidence supporting effectiveness and safety profile of using ketoanalogues of essential aminoacids for individuals with CKD. These crucial understandings have promoted its adoption into numerous global therapeutic practices. Furthermore, Ketosteril's advantageous pharmacoeconomic characteristics suggest its recommendation for the management of CKD in Kazakhstan.