

Cost-effectiveness analysis for the treatment of chronic kidney disease with low-protein diet

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ABSTRACT:

Background: Several clinical studies have shown that a low protein diet in patients with Chronic Kidney Disease (CKD), delays the natural progression of the end stage renal disease (ESRD) and the necessary treatment of chronic dialysis.

Objective: The aim of this study is to estimate the cost-effectiveness of a low protein diet compared with no dietary treatment in patients with CKD stage 4 and 5 after 2, 3, 5 and 10 years.

Method: A Markov model was developed to estimate costs and QALYs associated with low protein diet versus no treatment for patients with CKD stage 4-5. The transition probability was estimated on data from seven studies which determined the efficacy of low protein diets in delaying the need to start maintenance dialysis. The Quality Adjusted Life Years (QALYs) scores used were estimated with the Time Trade Off technique. The annual cost of dialysis per patient was estimated to be approximately €34,072. The costs of a low-protein diet was €1,440 per patient per year in the Lazio Region (conservative assumptions).

Results: Treatment with a low-protein diet was more effective in terms of QALYs: the difference was always in favour of dietary treatment from a 0.09 QALYS after the first two years, 0.16 after three years, 0.36 after five years and up to a differential of 0.93 year after the first 10 years of treatment. In terms of cost-effectiveness, the dietary treatment was always dominant in all intervals considered. The dominance is due to the fact that the treatment is more effective in terms of QALYs and at the same time is less expensive.

Conclusion: The results of these simulations indicate that the treatment of CKD patients with a low protein diet is cost effective relative to no treatment in an Italian setting. Further studies should test this model in other countries with different dialysis costs and dietary support.

Key words: chronic kidney disease, low-protein diet, cost-effectiveness of a low protein diet