

Body Composition, Physical Activity and Quality of Life in end-stage renal disease patients

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VALORISATION ADDENDUM

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Reports showed that at the end of 2013 approximately 3.200.000 patients were treated for ESRD worldwide. More or less than 2.522.000 of these patients were undergoing dialysis. Thereby it was suggested that these numbers will annually increase by 6 to 7 percent¹. In 2010 chronic kidney disease (CKD) was the 18th cause of total number of deaths worldwide, as compared with the 27th cause in 1990². These numbers clearly show the rapid increase of CKD worldwide. Additionally, not only the risk of mortality is high in ESRD patients, also the risk of comorbidity is very high in this patient group and has been shown to have a negatively associated with survival^{3,4}.

Costs for hemodialysis were \$87.945 and peritoneal dialysis were \$71.630 per patient per year respectively in 2011⁵, and it is known that these cost per patient will rise every year. Therefore, dialysis treatment is a high economic burden.

Next to high treatment costs, the burden of disease is high in dialysis patients. Numerous studies showed impaired health-related quality of life (HRQOL) scores in dialysis patients in both physical as well as mental health⁶⁻⁹, which are also directly related to physical activity (PA)^{10,11} and body composition (BC)¹². In addition, results showed strong associations between regular exercise and better HRQOL scores and survival¹⁰, and higher muscle mass and better physical functioning and QOL¹² in dialysis patients. Regardless of these findings, HRQOL is consistently shown to be lower in ESRD patients as compared with the general population^{6,8}, showing the undesirable effects of ESRD in these patients. Thus, even though dialysis is a life-saving treatment, and despite continuous technical developments in dialysis therapy, the burden of kidney disease remains high.

Both these economic and social effects of ESRD stress out the need for interventions that can slow down the progression of CKD and its complications. The current approach for treatment of CKD in the out-patient clinic is mainly based on delaying or halting the progression of renal dysfunction, as well as cardiovascular and metabolic complications. This treatment often consists of blood pressure control, lipid-lowering therapy, dietary advice on salt and protein intake, as well as phosphate control and vitamin D treatment¹³. Additionally, it is well known that exercise on a regular basis is beneficial in relation with outcome in CKD patients¹⁴⁻¹⁶. The guideline for diagnostics and treatment for CKD patients by the Dutch federation of nephrology recommend PA as an intervention goal for CKD patients with mild to moderate loss of kidney function, to reduce the risk of progression of kidney failure and/or cardiovascular complications¹⁷. Also the 'K/DOQI Clinical Practice Guidelines for Cardiovascular Disease in Dialysis Patients', state that PA should be encouraged by nephrologist and dialysis staff to increase PA levels. Next to that, PA and physical functioning should be evaluated every six months¹⁸. Nevertheless, in the current nephrology practice not much attention is addressed to self-management with regard to PA¹⁴, despite the recommendations. So, not implementing stimulation of PA into routine

patient care by nephrologists/dialysis staff, may contribute to low levels of PA and poor physical functioning¹⁴. Furthermore, low levels of PA and poor physical functioning are proven to affect HRQOL and survival¹⁴. All of this is already suggested since 1994, when the Life Options Rehabilitation Advisory Council (LORAC) promoted exercise in their renal rehabilitation report¹⁹. Still, PA programs are not overall implemented in the daily dialysis care, underscoring the need for awareness of this issue in the current renal care.

The lack regarding the promotion of PA is not only a pitfall of the current CKD care. On the one hand, making patients aware, and stimulating them to exercise, is a major advantage for successful rehabilitation of ESRD patients. On the other hand, high costs for PA programs make it difficult to keep patients exercise with the help of professionals. Therefore, one of the important concerns is the support of health insurance to make such programs easier accessible for patients, since ESRD is already a burden for the patient's economic status, due to loss of income and high costs of health care.

Ongoing research already focuses on the long term outcomes of PA programs for dialysis- and transplantation patients and the cost-effectiveness of group rehabilitation. Still, not many interventional studies focus on the earlier stages of CKD. This gives us the opportunity to investigate the effects of PA on parameters such as HRQOL, in CKD patients who are not on dialysis yet. Next to that it would be of great importance to study if the start of dialysis can be delayed by slowing down the progression of CKD in the early stages by stimulating PA.

New technologies, such as activity trackers could facilitate reminders to stay physically active, which may be the future for stimulating PA in patients with chronic diseases. As a recent study already showed, multidimensional PA feedback using graphics and visualizations may be very motivational, and support behavioral changes in patients with increased risk of chronic diseases²⁰.

Knowing that every postponement of starting dialysis, but also the prevention of comorbid diseases is cost effective, and as this thesis showed, what the importance is of PA in ESRD patients, and in line with that its relations with HRQOL, above mentioned interventions may provide beneficial outcomes of PA in CKD patient care, and a decline in the economic burden of kidney disease on the long term. This makes it very important to support research concerning PA, BC and HRQOL in the early CKD stages, but also during the dialysis phase.

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