

The effect of a multi-component lifestyle intervention on nutritional status and body composition in persons approaching dialysis

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Introduction: End stage kidney disease (ESKD) is characterised by several complications, including reduced physical function, anorexia and cachexia, which in turn often lead to reduced nutritional status and altered body composition, particularly during transition to dialysis. “PREHAB” (Pre-emptive rehabilitation in persons approaching dialysis) is a prospective randomised trial aiming to determine the effect of a multi-component exercise, nutrition and educational intervention upon clinical and health-related quality of life (HRQoL) outcomes in persons approaching dialysis, and incorporates assessment of nutritional status and body composition. The aim of this work was to assess the effect of our 3-month PREHAB intervention on changes in nutritional status and body composition prior to participants starting dialysis.

Methods: Patients with $eGFR \leq 15 \text{ ml/min/1.73m}^2$ who were able to exercise and were anticipated to require dialysis within 6 months, were invited to participate in the “PREHAB” trial. A comprehensive baseline assessment of physical function, nutritional status, and HRQoL was undertaken using validated methods. Nutritional status and body composition were assessed using body mass index (BMI), handgrip strength (HGS), mid-arm circumference (MAC), subjective global assessment (SGA), and dual-energy x-ray absorptiometry (DXA). Participants were then randomised to the PREHAB intervention or routine care. The multi-component PREHAB intervention included a weekly 1-hour gym-based exercise circuit and a varied multidisciplinary education programme over a 3-month period. Baseline assessments were repeated in both groups after the 3-month pre-dialysis intervention.

Results: 30 participants (16 male:14 female; median age 63 years (IQR 55-70); $eGFR 13 \text{ ml/min/1.73m}^2$) were assessed as shown in Table 1. The groups were well-matched for age, gender, and markers of nutritional status. At baseline, 23/30 (77%) participants were classified as well-nourished according to SGA, and 24/30 (80%) were overweight according to BMI. Markers of fat-free mass (MAC and % lean body mass (LBM)) were below reference values (MAC 33.7cm and 32.1cm; %LBM 77.2% and 67.5% in males and females respectively), and body fat percentage was higher than reference values (22.8% in males and 32.5% in females) in both groups. Most markers of nutritional status were maintained in both groups over the 3-month period, apart from a reduction in skeletal muscle mass index observed in the PREHAB group only.

Conclusion: Our observations suggest that some aspects of nutritional status and body composition may be starting to decline approximately 6 months before dialysis initiation, with values for some markers below reference values, and consistent with those reported in previous studies in the dialysis population. We did not find any significant changes in most markers of body composition and nutritional status during a 3-month pre-dialysis period in either the intervention or routine care group. Analysis from further follow-up during the first 6-months of dialysis will determine if nutritional status and body composition change during this time, and whether our PREHAB intervention offers any longer-term benefits.