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Nutritional Implications of Low Calorie Diets in Obese Patients with Chronic Kidney Disease: An Observational Study.

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Introduction It is recognised that the population with established renal failure has shown a demographic shift from predominant under-nutrition to overnutrition(1). Scottish estimates suggest that the prevalence of obesity in the chronic kidney disease (CKD) population (27%(2)) is consistent with that of the general population(3). Renal transplantation offers both a survival and cost benefit over dialysis(4) for many patients with end stage renal failure (ESRF), however, obese patients may present technical difficulties to renal transplantation and are at an increased risk of peri-operative complications. For these reasons, weight loss strategies in obese patients with CKD have attracted attention in recent years. The recent Diabetes Remission Clinical Trial(5) showed promise for the use of low calorie diets (LCDs) as a sustainable weight loss intervention in individuals with type 2 diabetes. Existing literature is limited as to whether there is a place for LCDs as a weight management strategy in patients with advanced CKD due to potential renal-specific dietary needs. This observational study aimed to examine the content of a variety of commercially available LCDs in comparison to renal-specific dietary recommendations to elucidate their suitability as an option for weight loss in renal patients.

Methods Eight commercial brands of LCDs were identified (Cambridge Weight Plan, Exante, Lighter Life, Shake that weight, Slim & Save, Slimfast, Counterweight and Optifast). Oral nutritional support (ONS) products from Abbott Nutrition® were also included as a comparison (Ensure Compact, Ensure crème, Ensure plus Yogurt style, Ensure Savoury and Ensure plus milkshake). Inclusion criteria for products into the study was the suitability for their use as total diet replacements using ≥3 homogeneous products to reach a total of 800-900kcal per day. LCDs were grouped by brand and according to product-type (meal-based, shake-based or ONS-based); and analysed for protein, sodium, potassium, phosphate and fluid content (as described by the manufacturer). This data was compared with renal-specific dietary recommendations for each of the nutrients.

Results Nutrient content varied greatly between all types and brands of LCDs. Comparisons between LCDs and renal dietary recommendations are represented in figures 1-5.

Conclusion This study demonstrates the large variations in nutrient content between different types of LCDs. No total dietary replacement product-type or brand studied here have been found to meet all dietary renal recommendations for protein, sodium, potassium and phosphate. Making an individual selection with regards to a suitable LCD for weight loss in patients with CKD emphasizes not only the challenges in managing fluid and dietary restrictions but also in ensuring nutritional adequacy in a demographic of individuals where requirements can fluctuate regularly with clinical and disease state. Whilst no specific conclusion can be drawn from this study with regards to attaining a single LCD for use in the renal population, these findings may aid the selection of the LCD product-type according to individual patient dietary and fluid needs. Indeed, more interventional studies and pragmatic trials assessing efficacy of LCDs on weight change are required to elucidate their potential use as safe, sustainable weight loss interventions in obese patients with advanced CKD.