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Institutet**

**Institutionen för klinisk vetenskap, intervention och teknik, Enheten  
för Baxter Novum och Enheten för medicinska njursjukdomar**

## **Assessment and monitoring of nutritional status in chronic kidney disease patients**

**AKADEMISK AVHANDLING**

som för avläggande av medicine doktorsexamen vid Karolinska  
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## ABSTRACT

Patients with chronic kidney disease (CKD) often suffer from malnutrition and protein-energy wasting (PEW) resulting in poor nutritional status which is a powerful predictor of mortality. As it is not clear how well nutritional markers used in the clinical care of these patients accurately reflect nutritional status we evaluated in post-hoc, cross-sectional observational studies several common markers of malnutrition and PEW, and assessed their correlations to each other and to survival in patients with CKD stage 5 (CKD 5).

In **Study I** self-rated appetite along with anthropometrics and biochemical markers of nutritional status were measured and related to all-cause mortality in 523 CKD 5 patients. This study shows that self-rated appetite is not an independent predictor of survival in most patients with CKD 5.

In **Study II** serum albumin, and other biochemical markers of nutritional status, clinical anthropometrics, and dual-energy x-ray absorptiometry, were assessed in CKD 5 patients. Analyzing data from 458 incident and 383 prevalent dialysis patients, we found that serum albumin correlates poorly with other markers of nutritional status. Thus, its value as a reliable marker of nutritional status appears limited.

In **Study III** serum insulin-like growth factor (IGF)-1 and biochemical, clinical, and densitometric markers of nutritional status and mineral and bone metabolism were evaluated in 365 incident dialysis patients. This study shows that low serum IGF-1 associates with a sarcopenic body composition and with markers of disturbed bone metabolism, while also predicting an increased risk of mortality.

In **Study IV** we assessed temporal changes in the appetite regulating peptide hormones pancreatic polypeptide (PP), glucose-dependent insulinotropic polypeptide (GIP), and glucagon-like peptide 1 (GLP-1) following a fat- and carbohydrate-rich meal in 6 hemodialysis patients and 9 healthy controls. This study shows that fasting levels of both PP and GIP levels and the postprandial PP response are elevated in HD patients as compared to controls. We speculate that this may be one mechanism whereby CKD engenders poor appetite.

In **Study V** several common markers of nutritional status were analyzed in 399 incident dialysis patients and 289 prevalent dialysis patients and, using multivariate regression models, related to results of subjective global assessment (SGA). This study shows that serum levels of albumin, creatinine, and cholesterol as well as handgrip strength are in general only weakly or not at all associated with PEW as assessed by SGA following correction for cofounders.