

Adiponectin subfractions and cardiovascular morbidity in patients with chronic kidney disease

Background

Adipokines are endocrinologically active peptides which are secreted by differentiated adipocytes. Among these adipokines, adiponectin appears to be of major clinical importance, even though its precise impact is discussed contradictorily. While elevated levels of adiponectin have been associated with incident diabetes mellitus type 2 and progression of chronic kidney disease in some clinical studies, low levels of adiponectin were linked to early kidney injury in experimental studies. More, reduced glomerular filtration rate and left ventricular dysfunction both induce a rise in circulating adiponectin levels.

Serum adiponectin is composed of different subfractions (high molecular weight, HMW; middle molecular weight, MMW; low molecular weight, LMW).

The CARE for HOME study aimed to analyse associations between kidney function, left ventricular function and subfractions of adiponectin. Precisely we set out to explore whether a subfraction-specific increase in adiponectin levels occurs in chronic kidney disease and which subfraction best predicts renal cardiovascular and renal events in patients with chronic kidney diseases.

Methods

We recruited 343 patients with chronic kidney disease stage K/DOQI 2 – 4 (208 men, 135 women, mean age 65 ± 12 years). Serum levels of total adiponectin and adiponectin subfractions were measured by ELISA.

For determining left ventricular function, serum NT-pro-BNP levels (Brain Natriuretic Peptide) were analysed, and echocardiographic studies were performed according to American Society of Echocardiography Guidelines.

All patients were followed for the occurrence of the combined renal end-point, which was defined as need for dialysis treatment and death. We analysed the prognostic impact of levels of total adiponectin, and of adiponectin subfractions, by Cox-regression analysis.

Results

Mean serum levels of total adiponectin were $7,37 \pm 4,49$ $\mu\text{g/ml}$. The serum levels of total adiponectin and of adiponectin subfractions were correlated with the glomerular filtration rate (total adiponectin: $r = 0,22$; HMW: $r = 0,18$; MMW: $r = 0,24$; LMW: $r = 0,21$); these correlation coefficients did not differ across subfractions.

Lg-transferred NT-pro-BNP levels were correlated with total adiponectin, and with adiponectin subfractions (total adiponectin: $r = 0,25$; HMW: $r = 0,19$; MMW: $r = 0,24$; LMW: $r = 0,28$; $p < 0,001$); again correlation coefficients did not differ across subfractions. Correlations between adiponectin subfractions and lg-transferred NT-pro-BNP remained significant after adjustment for estimated glomerular filtration rate (eGFR).

Elevated levels of adiponectin predicted the pre-defined end-point only in univariate analysis, but not adjustment for eGFR.

Conclusion

In summary, CARE for HOME study investigated interactions between adiponectin subfractions, residual renal function and left ventricular function for the first time in patients with chronic kidney disease.

Neither our cross-sectional analyses, nor our early longitudinal data suggest a unique impact of a specific adiponectin subfraction in chronic kidney disease. We are planning to prolong follow-up of the study participants until 2015 in order to evaluate the prognostic impact of adiponectin subfractions in more detail.