THE PROGNOSTIC ROLE OF STIFFNESS INDEX DETERMINED BY FINGER PHOTOPLETHYSMOGRAPHY IN CHRONIC KIDNEY DISEASE

Balázs Sági1,2, István Késői3, Tibor Vas1, Tibor Kovács1, István Wittmann1 and Judit Nagy1
1University of Pécs, 2nd Dep. of Internal Medicine and Nephrological Center, Pécs, Hungary, 2Fresenius Medical Care, Dialysis Center Pécs, Pécs, Hungary, 3Komló Health Center, Internal Medicine, Komló, Hungary

Introduction and Aims: Arterial stiffness has a prognostic role in chronic cardiovascular diseases. Pulse wave velocity (PWV) determined by the carotid-femoral pulse detection is accepted as a gold standard method. Further diagnostic procedures are in use to assess the arterial stiffness including the finger photoplethysmography. The prognostic role of this method is unknown chronic renal diseases. The goal of our investigation was to determine the prognostic significance of the arterial stiffness measured by the photoplethysmographic method in a homogenous group of chronic kidney disease patients.

Methods: One hundred and three IgA nephropathy patients with chronic kidney disease stage 1-4 were investigated and followed (67 male, 36 female, 45±11 years). End stage renal disease was an exclusion criterion. The stiffness index was determined by the volume alteration of the digital artery during the cardiac cycle. This merit showed a strong correlation with the PWV investigated by other methods in earlier studies. The average following time was 67 (6-107) months. The patients were divided into two groups according to the stiffness index; the cut-off point was 10 m/s. The combined end point was total mortality, any cardiovascular event including stroke, myocardial infarction or cardiovascular procedure and achieving the end stage renal disease including renal replacement therapy.

Results: The patients with increased stiffness index (>10 m/s) had significantly more end point events (19/43 vs. 10/60, Chi-square: 5.860, P=0.015 by Mantel-Cox log-rank test). Stiffness index has been proved an independent predictor on survival among several cardiovascular risk factors (age, hypertension, diabetes, obesity, lipid disturbances and renal function) using the Cox regression model in chronic kidney disease. Every 1 m/s increase in stiffness index resulted in a 17 % gain in the occurrence of the combined end point.

Conclusions: Stiffness index determined by finger photoplethysmography is an eligible parameter to assess the prognosis in chronic kidney disease. In IgA nephropathy increased stiffness index seems to be a good prognostic tool for identification of highest-risk patients.