

The Relationship of NT-proBNP and Dialysis Parameters with Outcome of Incident Haemodialysis Patients: Results from the Membrane Permeability Outcome Study

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Commentary

By Professor Richard Glasscock

The levels of NT-proBNP in the circulation of subject with end-stage renal disease (ESRD) treated by dialysis have prognostic utility for left ventricular disorders (including left ventricular hypertrophy), coronary artery disease, fluid overload and mortality, but the levels observed in such patients are much higher than those seen in patients with similar conditions that do not have CKD. To further examine the relationship between NT-proBNP levels and adverse outcomes in ESRD Locatelli and coworkers conducted a secondary analysis of subjects enrolled in the Membrane Permeability Outcome (MPO) study of high-flux and low-flux membrane dialyzers in 618 incident patients with ESRD. After a one-month run-in phase, the serum level of NT-proBNP was measured and associations with subsequent outcomes were assessed. The values of NT-proBNP were markedly skewed and not normally distributed (mean = 6224 pg/ml; median = 2124 pg/ml). Subjects with serum albumin levels <4 gm/dl had higher NT-proBNP levels. Markedly elevated NT-proBNP levels were also seen more frequently with older age, male gender, more cardiovascular disease (CVD), higher blood pressure, lower residual renal function, and higher C-reactive protein. Lower levels of NT-proBNP were observed in those patients treated with high flux membrane. By multivariable analysis both NT-proBNP levels and CVD were independently associated with poor outcomes (all-cause death and cardiovascu-

lar death), with a synergistic interaction. These observations suggest (but do not prove) that time-average fluid overload, with attendant inflammation, underlies at least some of the elevation in NT-proBNP seen in dialysis patients.

The lack of serial measurements of NT-proBNP, absence of echocardiographic assessment of cardiac function and ventricular dimensions, the absence of information on the extent of fluid volume overload and the absence of data on exact causes of death are a weakness of the study. Nevertheless, they point to the possible utility of measurement of NT-proBNP as surrogate variable for outcomes, perhaps related to volume overload. The finding of lower levels in patients treated with high-flux membranes suggest a possible 'biological link to improved survival in this group'. A prospective study is needed to examine such a hypothesis.

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