

A cross sectional and longitudinal evaluation of plasma inflammatory biomarkers in patients with stroke and CKD

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Background

Chronic kidney disease (CKD) is an independent risk factor for stroke but stroke is also an independent risk factor for adverse CKD outcomes. Inflammation is thought to contribute to poor clinical outcomes in CKD but has not been investigated in relation to patients with stroke and CKD. This study investigated if differences exist between inflammatory biomarkers in patients with CKD and stroke compared to CKD without stroke. Further, it investigated longitudinal changes in inflammation in patients who suffer an incident stroke whilst also suffering from non-dialysis CKD (ND-CKD).

Method

This CKD Kidney Cohort Study is a UK prospective cohort of more than 3000 patients with ND-CKD patients recruited since 2002. A propensity matched sample of patients, differentiated by previous stroke at study recruitment, had stored plasma analyzed for Interleukin-6 (IL-6), Von Willebrand Factor (VwF) and C-reactive protein (CRP). Multivariable cox regression analysed the associations between inflammation, death, end-stage renal disease (ESRD) and future non-fatal cardiovascular events (NFCVE). Changes in the biomarkers were also analyzed from annually collected samples both before and after incident stroke whilst in study.

Results

162 previous stroke patients were compared against 159 non-stroke patients at study entry. Patients were well matched for comorbidities, kidney function and demographics. There was no significant difference in inflammatory biomarkers between the two groups. Previous stroke was associated with greater mortality risk (median survival 38 months in previous stroke vs 53 months in non-stroke patients $p=0.01$). Higher inflammatory biomarker concentration levels were independently associated with death but not ESRD or NFCVE in the whole population. The hazard ratios (95% CI) for each 1SD increase in log IL-6, VwF and CRP for all-cause mortality were 1.35 (1.10-1.70), 1.26 (1.05-1.51) and 1.34 (1.12-1.61) respectively. Only CRP retained its independent association with death in the stroke population. There were no clinically significant changes in inflammatory biomarkers in the months approaching a stroke event or after a stroke event.

Discussion

In a matched ND-CKD population previous stroke was an important determinant of mortality. However, the adverse combination of stroke and ND-CKD does not seem to be driven by higher levels of inflammation, as biomarkers of inflammation were associated with worse outcome in both stroke and non-stroke ND-CKD patients.