Altered fibrin clot structure in patients with atrial fibrillation and worsening renal function

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Anticoagulation use in atrial fibrillation (AF) is common, but concurrent chronic kidney disease (CKD) reduces its efficacy and potentiates the risk of bleeding. Previous publications have demonstrated fibrin clot structures that were less porous (as compared to healthy control) in dialysis dependent, non-AF cohorts (1, 2). Tightly laced fibrin networks have been shown to be prothrombotic (3, 4).

In this study, plasma samples were collected from subjects with AF and various degree of CKD, who were adequately anticoagulated with warfarin. Clots were prepared from the plasma samples and visualised by Scanning Electron Microscopy (SEM) (5).

SEM and assessment of nanostructure revealed increased protofibril number, fibrin clot density, fibre diameter and decreased number of pores among those with the worst renal function (CKD stage 4) as compared to those with the best renal function (CKD stage 1).

This is the first study to demonstrate serial changes in fibrin clot structure across worsening degrees of renal function as classified by CKD stages. This may explain the increased risk of thrombosis experienced by those with CKD, even if anticoagulated with warfarin.

Conflicts of interest
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