# The predictor role of worsening renal function in patients with new onset atrial fibrillation on direct oral anticoagulant

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**Background:** Chronic kidney disease (CKD) is an important outcome predictor in patients with atrial fibrillation (AF). Moreover, renal function at baseline is used to guide oral anticoagulant (OA) selection and dosing at initial treatment. The prognostic role of worsening renal function (WRF) during treatment with direct oral anticoagulants (DOACS) has been poorly explored.

**Purpose:** To estimate the prognostic role of WRF in terms of major adverse cardiovascular events (MACEs) in a series of patients with newly diagnosed non-valvular AF (NVAF) treated with DOACs.

**Methods:** Among all patients with newly diagnosed NVAF and indication for OA between January 2017 and December 2018, we enrolled those treated with DOACs. Renal function at baseline and during follow-up was assessed with estimated glomerular filtration rates (eGFR). eGFR was calculated as a mean value of Cockcroft-Gault (CG), Modification of Diet in Renal Disease (MDRD) and Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) formulas. The hemorrhagic risk at baseline was estimated with the main available scores (HAS-BLED, ATRIA and ORBIT). WRF was defined as a decrease in eGFR of at least 20%. MACEs were evaluated according to the type of DOAC and the WRF. Major bleedings (MB) were defined according to the ISTH definition.

**Results:** The study population was constituted by 249 patients with newly diagnosed NVAF started on DOAC and followed for a median time of 14.1±8.6 months. Overall, WRF was observed in 58 cases (23.3%). Patients with WRF had significative higher rates of death (10.3% versus 3.1%, p=0.025) and MB (13.8% versus 4.7%, p=0.016). The incidence of bleeding events, acute coronary syndromes and stroke was not affected by WRF. Interestingly, CG formula better predicted the incidence of MB as compared to the other formulas (p=0.006). The type of DOAC did not significantly impact the observed renal impairment and had no effect on the occurrence of MACEs in patients showing WRF. The predictors of WRF were found to be age, female sex, low hemoglobin level and left ventricle end telediastolic volume. At multivariate analysis, WRF was identified as an independent predictor of MB (OR 3.1, 95% C.I, 1.12–8.58), regardless of the baseline bleeding risk.

**Conclusion:** This is the first prospective study to evaluate the impact of worsening renal function on cardiovascular events in patients with atrial fibrillation treated with DOACs. A significant WRF emerged as an independent predictor of death and MB. The specific DOAC did not affect either the entity of worsening renal function or the incidence of cardiovascular events.