Comparing renal function estimation formulae for dosing of direct oral anticoagulant in patients with atrial fibrillation

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Introduction: Dose of direct oral anticoagulants (DOACs) has been determined by estimated creatinine clearance using the Cockcroft-Gault (CG) formula according to recent guidelines. However, the performance of CG formula varies depending on age, weight and degree of renal function. The aim of this study was to assess the feasibility of using CG formula for determining dose of DOAC in comparison with non-CG formulae.

Methods: We collected data of patients taking DOAC for non-valvular atrial fibrillation (AF). Agreement and clinical performance between estimates calculated by CG, Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI), and Modification of Diet in Renal Disease (MDRD) formula were compared.

Result: A total of 6,268 consecutive patients with AF on anticoagulants were retrospectively investigated. The CG formula had excellent agreement with CKD-EPI formula in estimating renal function. As body weight decreased, CG formula underestimated renal function compared to non-CG formulae. On-label uses under the three formulae were associated with a lower risk of major bleeding but not thromboembolism compared to warfarin. Concordant rates of drug indication for on-label use of reduced dose by CG formula with those by CKD-EPI and MDRD formula were 81.7% and 81.5%, respectively. Drug indication for on-label use of standard dose was mostly concordant between CG and non-CG formulae.

Conclusion: Although there were differences in estimating renal function and proportions of drug indications between CG and non-CG formula, risks of thromboembolism and major bleeding were similar to those of warfarin regardless of formula.