Platelet reactivity in patients with impaired renal function receiving dual antiplatelet therapy with clopidogrel or ticagrelor

Lucia Barbieri,1 Monica Verdoia,1 Matteo Nardin,1 Paolo Marino,1 Harry Suryapranata,2 Giuseppe De Luca1
1University of Alabama at Birmingham, Birmingham, AL; 2The University of Kansas Medical Center, Kansas City, KS; 3The University of Kansas Hospital, Kansas City, KS; 4The Cardiac Center of Creighton University, Omaha, NE

BACKGROUND Suboptimal platelet inhibition still represents an important challenge, especially for patients undergoing percutaneous coronary interventions (PCI). Chronic kidney disease (CKD) is a common comorbidity of patients with coronary artery disease, and may potentially influence platelet reactivity. So far only few studies have assessed the role of CKD on response to dual antiplatelet therapy with conflicting results. Therefore, the aim of our study was to evaluate the impact of CKD on platelet function in patients treated with dual antiplatelet therapy (DAPT) after a recent acute coronary syndrome or PCI.

METHODS Patients treated with DAPT (ASA + clopidogrel or ticagrelor) for an ACS or elective patients undergoing PCI were scheduled for platelet function assessment at 30-90 days post-discharge. Platelet function was assessed by whole blood impedance aggregometry (Multiplate® - Roche Diagnostics AG). HRPR was considered for ASPI test >862 AU·min (for ASA) and ADP test values >417 AU·min (for ADP-antagonists). Chronic renal failure was defined as an estimated glomerular filtration rate of 60 ml/min/1.73m2 or less, calculated by applying MDRD (Modification of Diet in Renal Disease) formula.

RESULTS Our population included a total of 537 patients of which 308 (57.3%) received ASA and clopidogrel and 229 (42.6%) received ASA and ticagrelor. Patients with renal failure at baseline (101 out of 537, 18.8%) were older, with higher prevalence of history of hypertension, myocardial infarction and coronary artery bypass graft surgery. Moreover, they had a lower ejection fraction at baseline and were more often in therapy with diuretics, but less often with statins at admission. They had lower haemoglobin and higher glycated haemoglobin. HRPR was observed in 1.5% of patients treated with ASA with no difference according to renal function (p = 0.18). HRPR for ADP-antagonists was observed in 23.7% of patients, with no difference according to renal function (p = 0.50). This result was confirmed both with clopidogrel (31.9% versus 38%, p = 0.41) and ticagrelor (13.1% versus 10.8%, p = 0.99), also after correction for all baseline confounders (clopidogrel: adjusted OR [95%CI] = 1.26 [0.60 - 2.63], p = 0.54) (ticagrelor: adjusted OR[95%CI] = 0.95 [0.54 - 1.65], p = 0.84). The function of association between renal function and platelet reactivity was confirmed at linear regression analysis both with clopidogrel (r = -0.04, p = 0.52) and ticagrelor (r = 0.006, p = 0.92).

CONCLUSIONS In patients receiving dual antiplatelet therapy, chronic renal failure did not influence ADP-mediated platelet reactivity, with both ticagrelor or clopidogrel. No influence of chronic renal failure was found on the effectiveness of ASA.

Platelet reactivity in patients with impaired renal function receiving dual antiplatelet therapy with clopidogrel or ticagrelor

Lucia Barbieri,1 Monica Verdoia,1 Matteo Nardin,1 Paolo Marino,1 Harry Suryapranata,2 Giuseppe De Luca1
1University of Alabama at Birmingham, Birmingham, AL; 2The University of Kansas Medical Center, Kansas City, KS; 3The University of Kansas Hospital, Kansas City, KS; 4The Cardiac Center of Creighton University, Omaha, NE

BACKGROUND Suboptimal platelet inhibition still represents an important challenge, especially for patients undergoing percutaneous coronary interventions (PCI). Chronic kidney disease (CKD) is a common comorbidity of patients with coronary artery disease, and may potentially influence platelet reactivity. So far only few studies have assessed the role of CKD on response to dual antiplatelet therapy with conflicting results. Therefore, the aim of our study was to evaluate the impact of CKD on platelet function in patients treated with dual antiplatelet therapy (DAPT) after a recent acute coronary syndrome or PCI.

METHODS Patients treated with DAPT (ASA + clopidogrel or ticagrelor) for an ACS or elective patients undergoing PCI were scheduled for platelet function assessment at 30-90 days post-discharge. Platelet function was assessed by whole blood impedance aggregometry (Multiplate® - Roche Diagnostics AG). HRPR was considered for ASPI test >862 AU·min (for ASA) and ADP test values >417 AU·min (for ADP-antagonists). Chronic renal failure was defined as an estimated glomerular filtration rate of 60 ml/min/1.73m2 or less, calculated by applying MDRD (Modification of Diet in Renal Disease) formula.

RESULTS Our population included a total of 537 patients of which 308 (57.3%) received ASA and clopidogrel and 229 (42.6%) received ASA and ticagrelor. Patients with renal failure at baseline (101 out of 537, 18.8%) were older, with higher prevalence of history of hypertension, myocardial infarction and coronary artery bypass graft surgery. Moreover, they had a lower ejection fraction at baseline and were more often in therapy with diuretics, but less often with statins at admission. They had lower haemoglobin and higher glycated haemoglobin. HRPR was observed in 1.5% of patients treated with ASA with no difference according to renal function (p = 0.18). HRPR for ADP-antagonists was observed in 23.7% of patients, with no difference according to renal function (p = 0.50). This result was confirmed both with clopidogrel (31.9% versus 38%, p = 0.41) and ticagrelor (13.1% versus 10.8%, p = 0.99), also after correction for all baseline confounders (clopidogrel: adjusted OR [95%CI] = 1.26 [0.60 - 2.63], p = 0.54) (ticagrelor: adjusted OR[95%CI] = 0.95 [0.54 - 1.65], p = 0.84). The function of association between renal function and platelet reactivity was confirmed at linear regression analysis both with clopidogrel (r = -0.04, p = 0.52) and ticagrelor (r = 0.006, p = 0.92).

CONCLUSIONS In patients receiving dual antiplatelet therapy, chronic renal failure did not influence ADP-mediated platelet reactivity, with both ticagrelor or clopidogrel. No influence of chronic renal failure was found on the effectiveness of ASA.