CORONARY PLAQUE CHARACTERISTICS ACCORDING TO THE RENAL FUNCTION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION: AN INTRAVASCULAR ULTRASOUND ANALYSIS

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Background: The aim of this study was to assess the plaque characteristics in acute myocardial infarction (AMI) patients with varying degrees of renal dysfunction.

Methods: We used intravascular ultrasound (IVUS) to assess plaque morphology and morphometry in 310 acute myocardial infarction (AMI) patients (125 ST segment elevation and 185 non-ST segment elevation MI) with varying degrees of renal dysfunction according to creatinine clearance (CrCl): Group I [CrCl >70 ml/min (n=153)]; Group II [CrCl 30 to 69 ml/min (n=103)]; Group III [CrCl <30 ml/min, (n=54 including 20 dialysis patients)].

Results: The CrCl was 92.0±21.1 mg/min in highest CrCl group, 47.9±8.7 mg/min in middle CrCl group, 16.1±9.5 mg/min in lowest CrCl group. Reference segment and lesion site plaque burden were greatest (30.1±12.3% vs. 36.9±11.4% vs. 41.2±10.8%, p=0.003, and 77.4±11.0% vs. 79.8±10.3% vs. 82.0±10.3%, p=0.031, respectively) and lesions were longest (20.9±9.1 mm vs. 23.1±9.5 mm vs. 26.3±9.6 mm, p=0.038) in lowest CrCl group. Infarct-related artery plaque rupture (31.4% vs. 34.0% vs. 53.7%, p=0.011) and multiple plaque ruptures (11.1% vs. 12.6% vs. 33.3%, p<0.001) were most common, and ruptured plaque cavities were largest (1.98±0.89 mm2 vs. 2.20±1.45 mm2 vs. 3.06±1.70 mm2, p=0.002), and ruptured plaque was longest (2.33±0.93 mm vs. 2.59±1.50 mm vs. 3.33±1.76 mm, p=0.008) in lowest CrCl group. IVUS-detected thrombus was most frequently observed in lowest CrCl group (22.9% vs. 23.3% vs. 40.7%, p=0.027). During one-year follow-up, the incidences of non-fatal MI (2.6% vs. 4.9% vs. 11.1%, p=0.044) and cardiac death (3.9% vs. 6.8% vs. 14.8%, p=0.024) were observed most frequently in lowest CrCl group, and there was a strong trend toward highest incidence of stent thrombosis (2.0% vs. 3.9% vs. 9.3%, p=0.057) in lowest CrCl group.

Conclusions: A significant decrease in renal function (CrCl <30 ml/min) was associated with more diffuse atherosclerosis (longer lesions with larger reference segment plaque burden), more unstable plaque morphology (more frequent single and multiple plaque ruptures), and poor clinical outcome in patients with AMI.