Coronary Artery Disease, Acute Coronary Syndromes, Acute Cardiac Care – 18 - Acute Coronary Syndromes, 18.2 - Epidemiology, Prognosis, Outcome

The role of pre-existing renal dysfunction on in-hospital morbidity and mortality in patients with acute coronary syndrome

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Introduction: The baseline renal function is an important predictor for the prognosis of patients with acute coronary syndrome (ACS).

The aim of our study was to analyse the impact of pre-existing renal failure (RF) and the risk profile of patients with ACS on the development of in-hospital morbidity and mortality.

Materials and methods: This was a single-center cross-sectional cohort study on 2702 patients with ACS. The main exclusion criterion was pre-existing left ventricular (LV) dysfunction. Demographical and clinical characteristics, biochemical parameters, the anatomical distribution of coronary artery disease, and the final outcomes were analysed according to presence of RF at the moment of the index event. The estimated glomerular filtration rate (eGFR) was calculated by the Modification of Diet in Renal Disease Study Group Equation (MDRD), where patients with eGFR<60 ml/min/1.73 m2 had moderate to severe renal dysfunction.

Results: 777 (22.3%) out of 2702 patients had eGFR <60 ml/min at the moment of the index event. These patients were predominantly female, 34.1% (333) vs.17.7% (444), p=0.0004,OR 1.921(95%CI 1.701-2.168);older (70.0±9.7vs.60.5±10.7;p <0.000). They had significantly higher values of cardiac troponin (p=0.007), stress glycemia (p=0.000019), glycated hemoglobin (p=0.000012), and WBC (p=0.00001), meaning the extent of myocardial injury was bigger, with a more activated neuro-hormonal and inflammatory response in the conditions of the notably widespread anatomical distribution of CAD. However, patients with significantly reduced eGFR were less likely to be offered coronary angiography and PCI treatment, OR 0.524 (95%CI 0.434–0.632),p <0.000. As expected, anemia predominated in these patients (RBC 4.88±0.75 vs 4.53±0.58, p=0.000001; OR 1.27 (95% CI 1.09-1.48), and Hgb 143.81±16.69 vs 132.03±21.34, p=0.00001). They had a significantly lower level of sodium (p=0.008) and a higher level of potassium (p=0.00003). Interestingly, patients with eGFR <60 ml/min had lower lipoprotein levels. In-hospital mortality rate was 4.2%, however, significantly higher in reduced eGFR group (12% vs 1.9%, OR 6.9 (95% CI 4.9–9.8), p <0.00004). These patients were more likely to develop acute kidney injury [25.7% vs. 1.3%, OR 1.6 (95% CI 1.3-1.9, p = 0.000021)], pulmonary oedema [8% vs. 1.8%, OR 1.12 (95% CI 1.02-1.23, p = 0.000021), and cardiogenic shock [19.5% vs. 2.6%, OR 1.22 (95% CI 1.2-1.4), p = 0.00023]. Independent variables associated with RF were: advanced age, female gender, extracardiac ASCVD, previous CVI, previous RAAS treatment, stress glycemia, triglyceride, cholesterol, LDL-C, Hgb, WBC, and potassium level.

Conclusion: Patients with reduced eGFR (<60 ml/min) have a very specific risk profile, as identified in our study, and reduced eGFR is a major contributor to the prognosis of ACS, highly responsible for in-hospital morbidity and mortality.

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Multivariate logistic regression analysis

Table 1. Multivariate logistic regression analysis (backword conditional) for variables associated with eGFR

							95% C.I.for EXP(B)	
		B	S.E.	Wald	Sig.	Exp(B)	Lower	Upper
Step 1[a]	age	.081	.006	179.863	.000	1.085	1.072	1.097
	Extracardiac CVD (1)	.935	.434	4.634	.031	2.547	1.087	5.967
	CVI (1)	.798	.261	9.384	.002	2.221	1.333	3.702
	femaleo/male1(1)	-.418	.122	11.641	.001	.659	.518	.837
	Previous RAAS (1)	.226	.117	3.730	.053	1.253	.997	1.576
	Previous BB (1)	.193	.128	2.281	.131	1.213	.944	1.559
	Previous Statins (1)	.065	.138	.221	.638	1.067	.814	1.399
	Stress glycemia	.060	.011	30.990	.000	1.062	1.040	1.085
	TG	.116	.040	8.217	.004	1.123	1.037	1.215
	Chol	-.517	.174	8.830	.003	.596	.424	.839
	LDL-C	.558	.212	6.940	.008	1.747	1.154	2.646
	Non-HDL-C	-.079	.125	.400	.527	.924	.723	1.181
	RBC	-.182	.146	1.550	.213	.834	.626	1.110
	Hgb	-.012	.005	5.574	.018	.988	.979	.998
	WBC	.085	.014	35.945	.000	1.089	1.059	1.120
	Sodium	.027	.016	2.700	.100	1.027	.995	1.061
	Potassium	.437	.093	22.244	.000	1.549	1.291	1.858
	LVEF	-.005	.005	.915	.339	.995	.984	1.005
	Constant	-10.260	2.390	18.437	.000	.000		
Step 6[a]	age	.083	.006	194.537	.000	1.086	1.074	1.099
	Extracardiac CVD (1)	.955	.432	4.879	.027	2.599	1.114	6.065
	CVI (1)	.775	.260	8.888	.003	2.171	1.304	3.613
	femaleo/male 1(1)	-.397	.120	10.879	.001	.672	.531	.851
	Previous RAAS (1)	.235	.115	4.150	.042	1.264	1.009	1.584
	Previous BB (1)	.216	.120	3.239	.072	1.241	.981	1.570
	Stress glycemia	.055	.010	30.017	.000	1.057	1.036	1.078
	TG	.107	.038	8.041	.005	1.113	1.034	1.199
	Chol	-.548	.171	10.282	.001	.578	.414	.808
	LDL-C	.501	.187	7.199	.007	1.650	1.145	2.380
	Hgb	-.016	.003	23.357	.000	.985	.978	.991
	WBC	.086	.014	37.303	.000	1.090	1.060	1.120
	Potassium	.436	.092	22.339	.000	1.547	1.291	1.854
	Constant	-7.125	.779	83.567	.000	.001		

In multivariate analysis (Logistic regression analysis - backword conditional), in model with Chi square 585.898, so p=0.00004, with 82.4% correct classification, we identified several independent variables associated with reduced renal function: advanced age, female gender, extracardiac ASCVD, previous CVI, previous RAAS treatment, stress glycemia, TG, Chol, LDL-C, Hgb, WBC and potassium level.