Periproceduralna ozljeda miokarda pri elektivnoj perkutanoj intervenciji u kroničnoj bubrežnoj bolesti

Association of chronic kidney disease with periprocedural myocardial injury after elective stent implantation

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Uvod: Koronarna bolest srca je vodeći uzrok smrtnosti bolesnika s kroničnom bubrežnom bolesti (CKD). Bolesnici s CKD, podvrgnuti perkutanoj koronarnoj intervenciji (PCI), imaju veći rizik razvoja štetnih kardiovaskularnih događaja te lošiji rani i kasni ishod koronarne revaskularizacije u odnosu na bolesnike s očuvanom bubrežnom funkcijom¹. Cilj ovog istraživanja je odrediti incidenciju i intenzitet periproceduralne ozljede miokarda (PMI) tijekom elektivne PCI kod bolesnika s CKD.

Pacijenti i metode: Ovo je prospektivna studija koja uključuje 344 bolesnika sa stabilnom koronarnom bolesti koji su podvrgnuti elektivnoj PCI u Kliničkoj bolnici Merkur, Zagreb, u razdoblju od ožujka 2012. do lipnja 2015. godine (tablica 1). Ispitanici su podijeljeni u kontrolnu skupinu s očuvanom bubrežnom funkcijom (eGFR > 90 ml/min/1,73 m²) i ispitivanu skupinu s CKD odnosno s eGFR < 90 ml/min/1,73 m². Ispitivana skupina je dalje podijeljena u četiri podskupine ovisno o stadiju bubrežne bolesti. Serumska koncentracija troponina I (cTnI) je određena bazalno te 8 i 16 sati nakon PCI. Periproceduralni porast cTnI iznad gornje referentne serumske vrijednosti (URL) definira PMI. Periproceduralni porast cTnI ≥ 5 x URL definira PMI višeg stupnja dok porast cTnI < 5 x URL definira PMI nižeg stupnja².

Rezultati: Statističkom analizom prikupljenih podataka, nije bilo značajne razlike u incidenciji PMI između kontrolne i ispitivane skupine bolesnika 8 sati (47,6% vs 44,9%, p=0,62) i 16 sati (64,8% vs. 61,6%, p=0,55) nakon PCI. Isto tako nije bilo statistički značajne razlike u intenzitetu PMI između kontrolne i ispitivane skupine nakon 8 (0,13 ± 0,33 i 0,11 ± 0,21, p=0,58) odnosno nakon 16 sati (0,24 ± 0,46 i 0,29 ± 0,86, p=0,61) od PCI. Nije bilo statistički značajne razlike u incidenciji kao i u intenzitetu PMI nakon 8 i nakon 16 sati od PCI između kontrolne skupine i pojedinih CKD podskupina bolesnika (slika 1, slika 2).

Zaključak: Ova studija nije prikazala povezanost incidencije i intenziteta PMI i prisutnosti CKD. Isto tako, viši stupanj odnosno težina bubrežne bolesti nije utjecala na veću incidenciju odnosno intenzitet PMI nakon elektivne PCI.

Objectives: Coronary artery disease (CAD) is the leading cause of mortality in patients with chronic kidney disease (CKD). Patients with CKD who undergo coronary revascularization may have more ischemic events than patients without CKD¹. The aim of this study was to determine the incidence and intensity of periprocedural myocardial injury (PMI) after elective stent implantation among patients with and without CKD.

Patients and Methods: This study prospectively included 344 consecutive patients with stable angina pectoris who underwent an elective PCI at Merkur University Hospital, Zagreb, Croatia, in a period between March 2012 and June 2015 (Table 1). Patients were divided into two groups: control group with estimated glomerular filtration rate (eGFR) > 90 ml/min/1.73m² and the CKD group with eGFR < 90 ml/min/1.73m², with further subdivision according to CKD stage. Serum troponin I (cTnI) concentrations were measured at baseline and at 8 and 16 hours after PCI. Periprocedural increase of cTnI above the upper reference limit (URL) was defined as PMI. If cTnI increase ≥ 5x URL, it was considered a PMI of high degree, while an increase to < 5x URL was considered a PMI of low degree².

Results: There were no significant differences in incidence of PMI between control and CKD group after 8 hours (47.6% vs 44.9%, p=0.62) or after 16 hours (64.8% vs. 61.6%, p=0.55). There were also no significant differences in intensity of PMI between control and CKD group after 8 hours (0.13 ± 0.33 vs 0.11 ± 0.21, p=0.58) or after 16 hours (0.24 ± 0.46 vs 0.29 ± 0.86, p=0.61). We further assessed incidence and severity of PMI with respect to CKD burden (i.e. CKD stage) and we found no significant differences in the incidence or intensity of PMI 8 and 16 h after PCI in groups according to the eGFR (Figure 1, Figure 2).

Conclusion: We found no association between incidence or intensity of PMI and the presence of CKD. Furthermore, CKD burden (i.e. stratification of patients according to the CKD stage) was also not associated with higher incidence or intensity of PMI after elective PCI.

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TABLE 1. Baseline characteristics of the study participants.

	eGFR >90 ml/min/1.73 m ² (n= 128)	eGFR <90 ml/min/1.73m ² (n= 216)	p value
Male, n (%)	102 (79.6)	140 (64.8)	<0.01
Age, years	59.7 ± 8.1	67.1 ± 10.2	<0.01
BMI>30 kg/m ² (%)	38 (29.6)	73 (33.7)	0.43
Hypertension, n (%)	112 (87.5)	201 (93.0)	0.08
Hyperlipidemia (%)	107 (83.6)	186 (86.1)	0.64
Diabetes mellitus, n (%)	38 (29.6)	83 (38.4)	0.10
Current smoker, n (%)	37 (28.9)	33 (15.3)	<0.01
Previous PCI, n (%)	43 (33.6)	65 (30.1)	0.50
Previous CABG, n (%)	3 (2.3)	9 (4.1)	0.37
Medication:			
ACE inhibitors, n (%)	107 (83.6)	188 (87.1)	0.47
ARB, n (%)	11 (8.6)	22 (10.2)	0.62
Beta blockers, n (%)	110 (85.9)	177 (81.9)	0.50
Lipid-lowering drugs, n (%)	106 (82.8)	188 (87.1)	0.23

eGFR = estimated glomerular filtration rate; BMI = body mass index; CABG = coronary artery bypass grafting; PCI = percutaneous coronary intervention; ACE = angiotensin-converting enzyme; ARB = angiotensin II receptor blocker

FIGURE 1. Incidence of periprocedural myocardial injury 8 h after percutaneous coronary intervention according to the estimated glomerular filtration rate.

FIGURE 2. Incidence of periprocedural myocardial injury 16 h after percutaneous coronary intervention according to the estimated glomerular filtration rate.

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