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Metformin, arterial contrast and acute kidney injury

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To the Editor:

We read with great pleasure the article by Namazi et al. in your esteemed journal regarding metformin use in patients with diabetes undergoing coronary angiography (1). We were specially intrigued by the discussion in results section where it was noted that M (+) and M (-) groups had no difference in the terms of contrast induced nephropathy (CIN) or Acute kidney injury (AKI) after contrast exposure. We wish to share from our data of critically ill patients on metformin treatment who underwent arterial contrast exposure for urgent coronary angiography. We did a retrospective chart review of 154 patients who underwent emergency coronary angiography (CAG) with arterial contrast exposure. The study was approved by the institution review board (Metrowest Medical Center IRB, Framingham Massachusetts, USA). 154 patients admitted with acute coronary syndrome during months of January 2014 - December 2014; 67 patients used metformin (100% had diabetes mellitus) whereas 87 were not on metformin (31% had diabetes mellitus). Baseline demographics and results are explained in Table 1. M (+) group of patients were continued on metformin after arterial contrast exposure; M (-) group was compared with the first group in terms of CIN (change in serum creatinine or GFR).

CIN or AKI after contrast exposure was defined as more than 25% rise in serum creatinine levels from baseline at 48 hours after contrast exposure absolute rise in creatinine by 0.5 mg/dL (2). Our study revealed no difference in contrast induced nephropathy (CIN) between the two groups (p=0.29), when compared at 48 hours after arterial contrast exposure. Higher serum creatinine may be have precluded the use of metformin in the control group. The American College of Radiology (ACR) guidelines recommend discontinuing metformin before or after exposure to iodinated contrast or checking kidney function after the procedure for patients with eGFR ≥ 30 mL/min/1.73 m^2. Patients undergoing arterial catheter studies or with eGFR below 30 mL/min/1.73 m^2, recommendations are to discontinue metformin before and 48 hours after the procedure and should not be restarted until the renal function is normalized (3).

Our single center, small observational study showed no difference in the incidence of CIN in patients who continued to be on metformin after arterial contrast exposure compared to the control group. Oktay et al. published similar findings in their study of patients who received arterial contrast for CAG (4, 5). Another group from the Netherlands also showed no difference in CIN episodes despite continuation of metformin in patients undergoing emergency CAG. Another recent study from Auti et al. in a recent study further risk stratified the Indian population with chronic kidney disease who are at higher risk for sustaining CIN (2). Study from Namazi et al. sheds light on the ever propagating issue of continuation versus discontinuation of metformin to avoid metformin associated lactic acidosis in patients undergoing coronary angiography, and attempted to prove the safety of metformin use. We intend to extend that spectrum associated with this issue by providing evidence against

Table 1

	Metformin (+) (67)	Metformin (-) (87)	P
Age, Years	65.81 ± 1.163	70.07 ± 1.199	**0.0135**
Gender, Female	30 (44.7%)	40 (45.9%)	
Diabetes	100%	31%	
HbA1C	7.569 ± 0.2234	7.192 ± 0.1777	0.1836
Baseline Creatinine	0.9834 ± 0.05473	1.585 ± 0.1792	**0.0046**
% change in Creatinine at 24 hours	-3.610 ± 3.397	-6.728 ± 2.224	**0.4252**
% change in Creatinine at 48 hours	22.36 ± 29.44	44.82 ± 31.24	**0.6076**
Incidence of AKI/CIN (>25% increase in Creatinine)	9 (67)	7 (87)	**0.2988**
Baseline eGFR mL/min/1.73m^2	76.48 ± 2.708	59.30 ± 3.085	**<0.0001**
% change in eGFR at 24 hours	-0.3281 ± 2.754	6.058 ± 2.299	**0.0768**
% change in eGFR at 48 hours	-12.21 ± 5.973	-3.883 ± 4.040	**0.2366**
Amount of arterial contrast received (mL)	180.4 ± 11.50	177.4 ± 8.837	0.8298
Average daily amount of Metformin (mg)	1525 ± 581.6	NA	

CIN associated with metformin and arterial contrast exposure from our center. Bigger and appropriately powered randomized controlled trials would definitely provide a concrete evidence, but emerging data shows chronic metformin treatment prior to primary PCI has no significant impact on CIN.

Amos Lal, and Nirmal J. Kaur contributed equally to the manuscript.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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