Effects of acute arginine treatment on vascular endothelial dysfunction associated with ischemic acute kidney injury.

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Background : It has been reported that the incidence of cardiovascular diseases were increased after acute kidney injury (AKI). On the other hand, there are few reports that evaluated vascular endothelial function underlying cardiovascular risk after AKI. We have previously confirmed that vascular endothelial function declines after AKI. This study, we examined the relationship between vascular endothelial dysfunction in AKI and indoxyl sulfate (IS) and NO bioavailability.

Methods : Ischemic AKI (IAKI) model was prepared by renal ischemia reperfusion (IR). One, 7 and 28 day after IR, blood and urine were collected, and IS concentration were measured. NO bioavailability was evaluated by acute treatment with arginine in organ bath.

Results : One day after IR, the IS clearance was decreased, and it recovered to the same extent as sham with the recovery of renal function. The attenuation of vascular endothelial function observed in IR was significantly improved by the arginine acute treatment and the combined treatment with arginine and arginase inhibitor.

Conclusion : These results suggest that a temporary increase in uremic toxin associated with decreased renal function partially contributes to vascular endothelial dysfunction in AKI. Furthermore, the decline of utilization of arginine may be involved in the above phenomena.