Conclusion: BMI is an independent risk factor for AKI after cardiac surgery, the AKI incidence increased, as BMI gained. The hospital prognosis of AKI and AKI-RRT were optimum, when BMI was 24–28 kg/m².

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0201 Role of SIRT1 in Study of Renal Ischemia-Reperfusion Injury and Its Effect on NF-κBp65-PGC-1α Signal Pathway In Mice

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Objective: To investigate the role of silent mating type information regulation 2 homologue 1 (SIRT1) in renal ischemia-reperfusion (IR) injury and its effect on nuclear factor-κB (NF-κBp65)-peroxisome proliferator-activated receptor gamma coactivator 1 alpha (PGC-1α) signal pathway in mice.

Methods: Animal models of renal ischemia-reperfusion injury were established in a total of 90 healthy male C57BL/6 mice. Determination techniques included routine biochemical methods for the levels of serum creatinine and blood urea nitrogen (BUN), spectrophotometry for the level of superoxide dismutase (SOD), H-E staining for the histological changes as well as immunohistochemical and Western blotting analyses for the expressions of SIRT1, NF-κBp65 and PGC-1α, respectively.

Results: Compared with that in control and sham-operated groups, the levels of serum creatinine and BUN were higher and SOD level in renal tissues were lower at 12 h and 24 h after operation in IR groups (P < 0.05). H-E staining revealed evident pathological lesions including necrosis of renal tubular epithelial cells in IR groups. Compared with the corresponding IR group, resveratrol attenuated the above-mentioned changes (P < 0.05) while EX527 aggravated those (P < 0.05). Both Western blotting and immunohistochemistry revealed the upregulated SIRT1 expression and the activated NF-κB signal pathway, the upregulated p65 expression and the downregulated PGC-1α expression subsequent to IR (P < 0.05). The expressions of SIRT1 and PGC-1α in resveratrol group were upregulated compared to that in IR group (P < 0.05) and the NF-κBp65 expression was downregulated (P < 0.05). While the SIRT1 and PGC-1α expressions in EX527 group were downregulated compared to that in IR group (P < 0.05) and the NF-κBp65 expression was upregulated (P < 0.05).

Conclusion: In mouse model of renal ischemia-reperfusion injury, the activation of SIRT1 could inhibit the NF-κBp65 expression and accordingly upregulated PGC-1α level, contributing to inhibited inflammatory reactions and attenuated oxidative stress-induced injury in the protection of the kidneys.

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0208 Vicious Circle of NLRP3 and Mitochondrial Damage Plays Central Role in Renal Ischemia-Reperfusion Injury

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Background: Tubular epithelial cells dysfunction and loss play a critical role in the evolution of AKI. Recent work suggested that mitochondrial damage and NLRP3 inflammasome activation are important drivers of AKI-associated pathology. And TXNIP, an endogenous inhibitor of the antioxidant thioredoxin and reactive oxygen species (ROS) sensor, may has a role in activating NLRP3 inflammasome.

Methods: C57BL/6J and NLRP3−/− mice were subject to 30 minutes of ischemia and 1, 3 and 7 days of reperfusion. We used mito-TEMPO, mitochondria-targeted antioxidant, to investigate whether NLRP3 inflammasome activation could be inhibited by reducing mitochondrial derived ROS (mROS). The mice were then sacrificed 1 day, 3 days or 7 days after renal ischemia reperfusion injury, and blood and tissues were harvested. In vitro study, we used a tubular epithelial cell line (HK-2). Cells were incubated for 1, 3, 6 or 9 hours of hypoxia-hypoglycemic plus 2 hours of normoxia-normal-glucose incubation. Oxygen-glucose deprivation injury occurred by placing cells in a hypoxic environment (1% O2/5% CO2/94% N2) in the presence of glucose-free DMEM medium for 1, 3, 6 or 9 hours. Mitochondrial damage and the activation of NLRP3 were measured.

Results: In this study, we established an ischemia reperfusion induced-AKI model characterized by tubular epithelial cells damage, mitochondria dysfunction which led to the excessive production of mROS. The renal expression levels of the NLRP3, IL-1β and IL-18 were significantly increased in this animal model. However, kidney dysfunction and mitochondrial damage were attenuated obviously in NLRP3−/− mice compared with WT mice with ischemia AKI. In vitro, oxygen-glucose deprivation injury timely dependently increased the expression levels of NLRP3 inflammasome axis. The mitochondrial injury in damaged HK2 cells was also suppressed by silencing NLRP3 and caspase1.

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