

## عنوان مقاله:

Impact of combined ischemic preconditioning and melatonin on renal ischemia-reperfusion injury in rats

## محل انتشار:

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## خلاصه مقاله:

Objective(s): Studying the effect of melatonin pretreatment and ischemic preconditioning on renal ischemia-reperfusion injury (IRI). Materials and Methods: Forty-eight Wistar rats were randomized into six groups: control, sham operation, IRI (IRI in left kidney + right nephrectomy), IRI+ischemic preconditioning, IRI+Melatonin, and IRI+ischemic preconditioning+Melatonin groups. Melatonin (10 mg/kg) was intraperitoneally injected for 4 weeks before renal IRI. Ischemic preconditioning was performed by three cycles of 2 min-ischemia followed by 5 min-reperfusion period. A right nephrectomy was initially done and the left renal artery was clamped for 45 min. After 24 hr of ischemia-reperfusion, rats were decapitated. Kidney tissue samples were taken for histopathological assessment and the determination of kidney proinflammatory and anti-inflammatory cytokines, apoptotic protein caspase-3, oxidative stress markers, and activities of antioxidant enzymes. Serum creatinine and blood urea nitrogen (BUN) concentrations were measured for evaluation of renal function. Results: Renal IRI animals showed increased levels of creatinine, BUN, tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), caspase-3, total nitrite/nitrate, and malondialdehyde (MDA), and decreased levels of interleukin-13 (IL-13), and activities of glutathione peroxidase (GPx) and superoxide dismutase (SOD). Melatonin pretreatment or ischemic preconditioning resulted in decreased creatinine, BUN, TNF- $\alpha$ , caspase-3, nitrite/nitrate, and MDA, and increased IL-13, GPx, and SOD, with improved histopathological changes. Combined melatonin and ischemic preconditioning showed more effective improvement in renal IRI changes rather than melatonin or ischemic preconditioning alone. Conclusion: Combined melatonin and ischemic preconditioning have better beneficial effects on renal IRI than applying each one alone.

## کلمات کلیدی:

Ischemic preconditioning, Ischemia-reperfusion injury, Melatonin, Oxidative stress, Wistar rat

