



## Research Highlight

# Berberine: A Powerful Supplement to Cure Acute Renal Failure

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Renal Ischemia/Reperfusion (I/R) injury contributes mainly to Acute Renal Failure (ARF) in both native as well as transplanted kidneys<sup>1</sup>. Accordingly, inflammation is considered as a main cause of renal I/R injury which leads towards renal dysfunction.

In the kidney, inflammatory procedure is started by both endothelial as well as tubular cell dysfunction. The production and release of biologically active mediators including bradykinin as well as pro-inflammatory cytokines like interleukin (IL)-1, IL-6 and Tumor Necrosis Factor (TNF)- $\alpha$ , become a cause of inflammation within the kidney<sup>2</sup>. It is reported that renal inflammation involves a major degree of oxidative stress<sup>3</sup>, contributing to the development of renal I/R injury<sup>4</sup>.

Due to negative side effects of several pharmacological agents, attention towards the application of medicinal plants is flourishing. Despite of modern system of medicine, sufficient drugs are not available to defend the kidney against a variety of damages.

In this regard, Berberine is a good choice that is an alkaloid isolated from

rhizomes, roots as well as stem bulk of the plants including the Berberidaceae family.

Berberine is a bioactive compound which recently, it has attained much attention due to its anti-inflammatory, anticancer, antioxidant, antiviral as well as antibacterial activities<sup>5</sup>.

Berberine affects the body at the molecular level and it has a variety of functions inside cells. This supplement activates an important enzyme called Activated protein kinase (AMPK), which plays a key role in regulating metabolism<sup>6</sup>. This enzyme is also referred to as "metabolic master switch".

These facts motivated scientists for designing a new experiment to study the effect of berberine on the renal dysfunction as well as histological damage induced by renal ischaemia/reperfusion at an early stage<sup>7</sup>.

For this purpose, 4 groups were made. Accordingly, in Ber+I/R group, rats received berberine orally for seven days. The I/R group was subjected to distilled water orally for 7 days. While in sham and Ber+sham groups, distilled water and berberin respectively, was given orally for seven days

### Key words:

Acute renal failure, inflammation, biologically active mediators, berberine, renal arteries, anti-oxidant properties, oxidative stress, medicinal plants

before surgery. Renal ischemia was induced by occlusion of both renal arteries for 45 min followed by 24 h of reperfusion<sup>7</sup>.

Conclusively, administration of berberine before a period of 45 min ischemia/24 h reperfusion markedly offset the renal tissue damage, possibly because of inhibition of inflammatory events. It also blunted the renal dysfunction and therefore attenuated the amplification in [Cr]P as well as [UN]<sub>p</sub>. Therefore, scientists suggested that the anti-inflammatory and anti-oxidant characteristics of berberine may alleviate renal damages induced by ischemic ARF at the early phase.

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