



Polydatin Extracted from *Polygonum cuspidatum* Sieb. et Zucc. Alleviates Acute Kidney Injury in Mice with Sepsis

Lijuan CHEN¹, Bo QIU^{2,3}, Zhengxuan ZHANG⁴ & Ai HE^{2*}

¹ School of Medicine, Hubei Polytechnic University, Huangshi 435003, China

² Department of Pediatrics, Huangshi Maternity and Children's Health Hospital, Affiliated Maternity and Children's Health Hospital of Hubei Polytechnic University, Huangshi Key Laboratory of Birth Defects Prevention, Huangshi 435000, China

³ Hubei Key Laboratory for Kidney Disease Pathogenesis and Intervention, Medical College, Hubei Polytechnic University, Huangshi 435000, China

⁴ Huangshi Center For Food and Drug Control, Huangshi 435000, China

SUMMARY. In this study, polydatin was extracted from *Polygonum cuspidatum* Sieb. et Zucc. and its alleviative effect on acute kidney injury in mice with sepsis was explored. Sixty mice were randomly divided into control, model and treatment groups, 20 mice in each group. The sepsis model was established in latter two groups. Then, the treatment group was treated with 40 mg/kg polydatin by injection through the tail vein. After 12 h from treatment, compared with control group, in treatment group the serum creatinine and blood urea nitrogen levels were significantly decreased, the kidney water content and kidney injury score were significantly lowered, the kidney tissue tumor necrosis factor α , interleukin 6 and interleukin 1 β levels were significantly decreased, the kidney tissue superoxide dismutase and glutathione levels were significantly increased, the kidney tissue malondialdehyde level was significantly decreased, the kidney tissue B-cell lymphoma-2 protein expression level was significantly increased, and the kidney tissue B-cellymphoma-2 associated X and cysteinyl aspartate specific proteinase-3 protein expression levels were significantly decreased (all $p < 0.05$). In conclusion, polydatin from *Polygonum cuspidatum* Sieb. et Zucc. can alleviate the acute kidney injury in mice with sepsis. The action mechanism may be its reduction of inflammatory response, decrease of oxidative stress and inhibition of cell apoptosis in kidney tissues.

RESUMEN. En este estudio, se extrajo polidatina de *Polygonum cuspidatum* Sieb. et Zucc. y se exploró su efecto paliativo sobre la lesión renal aguda en ratones con sepsis. Sesenta ratones se dividieron aleatoriamente en grupos de control, modelo y tratamiento, 20 ratones en cada grupo. El modelo de sepsis se estableció en los dos últimos grupos. Luego, el grupo de tratamiento se trató con 40 mg/kg de polidatina mediante inyección a través de la vena de la cola. Después de 12 h de tratamiento, en comparación con el grupo de control, en el grupo de tratamiento los niveles de creatinina sérica y nitrógeno ureico en sangre se redujeron significativamente, el contenido de agua del riñón y la puntuación de daño renal se redujeron significativamente, el factor de necrosis tumoral del tejido renal α , la interleucina 6 y la interleucina Los niveles de 1 β disminuyeron significativamente, los niveles de superóxido dismutasa y glutatión en el tejido renal aumentaron significativamente, el nivel de malondialdehído en el tejido renal disminuyó significativamente, el nivel de expresión de la proteína del linfoma-2 de células B en el tejido renal aumentó significativamente y el linfoma de células B en el tejido renal -2 asociado X y cisteinil aspartato específica proteinasa-3 los niveles de expresión de la proteína se redujeron significativamente (todos $p < 0,05$). En conclusión, la polidatina de *Polygonum cuspidatum* Sieb. et Zucc. puede aliviar la lesión renal aguda en ratones con sepsis. El mecanismo de acción puede ser su reducción de la respuesta inflamatoria, disminución del estrés oxidativo e inhibición de la apoptosis celular en los tejidos renales.

KEY WORDS: acute kidney injury, apoptosis, inflammatory, polydatin, sepsis,

* Author to whom correspondence should be addressed. E-mail: huangshiaihe@126.com