

## An Experimental Study on Anti-inflammatory and Antioxidant Effects of Sophoridine in Mice with Lipopolysaccharide-induced Acute Lung Injury

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**SUMMARY.** This study aimed to investigate the anti-inflammatory and antioxidant effects of sophoridine in mice with lipopolysaccharide (LPS)-induced acute lung injury (ALI). Seventy-five mice were divided into control, model and 2.5, 5 and 10 mg/g sophoridine groups. The latter three groups were treated with 2.5, 5, and 10 mg/g sophoridine for three days, respectively. Then, the ALI model was established in latter four groups. After 6 h from ALI modeling, the blood gas analysis was performed. The total protein and polymorphonuclear neutrophils (PMN) in bronchoalveolar lavage fluid (BALF) were determined. The lung index and wet-dry mass ratio (W/D) were measured. The lung tissue inflammatory response and oxidative stress indexes were detected. Results showed that, compared with model group, in sophoridine groups the partial pressure of oxygen was significantly increased, the partial pressure of carbon dioxide was significantly decreased, the total protein level and PMN percentage in BALF were significantly decreased, the lung index and lung W/D were significantly decreased, the lung tissue tumor necrosis factor  $\alpha$ , interleukin  $1\beta$  and malondialdehyde levels were significantly decreased, and the lung tissue superoxide dismutase level was significantly increased. In conclusion, the sophoridine pretreatment can mitigate the LPS-induced ALI in mice, and the mechanisms may be related to its anti-inflammatory and antioxidant effects.

**RESUMEN.** Este estudio tuvo como objetivo investigar los efectos antiinflamatorios y antioxidantes de la sofordinina en ratones con lesión pulmonar aguda (ALI) inducida por lipopolisacárido (LPS). Setenta y cinco ratones se dividieron en grupos de control, modelo y 2,5, 5 y 10 mg/g de sofordinina. Los últimos tres grupos fueron tratados con 2,5, 5 y 10 mg/g de sofordinina durante tres días, respectivamente. Luego, se estableció el modelo ALI en los últimos cuatro grupos. Después de 6 h desde el modelado ALI, se realizó el análisis de gases en sangre. Se determinaron las proteínas totales y los neutrófilos polimorfonucleares (PMN) en líquido de lavado broncoalveolar (BALF). Se midieron el índice pulmonar y la relación de masa húmeda-seca (W/D). Se detectaron la respuesta inflamatoria del tejido pulmonar y los índices de estrés oxidativo. Los resultados mostraron que, en comparación con el grupo modelo, en los grupos de sofordinina, la presión parcial de oxígeno aumentó significativamente, la presión parcial de dióxido de carbono disminuyó significativamente, el nivel de proteína total y el porcentaje de PMN en BALF disminuyeron significativamente, el índice pulmonar y W/D pulmonar se redujeron significativamente, los niveles de factor de necrosis tumoral  $\alpha$  de tejido pulmonar, interleucina  $1\beta$  y malondialdehído se redujeron significativamente, y el nivel de superóxido dismutasa de tejido pulmonar aumentó significativamente. En conclusión, el pretratamiento con sofordinina puede mitigar la ALI inducida por LPS en ratones, y los mecanismos pueden estar relacionados con sus efectos antiinflamatorios y antioxidantes.

**KEY WORDS:** acute lung injury, antioxidant, inflammatory, lipopolysaccharide, sophoridine.

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