

## Curcumin Prevents Lung Ischemia-Reperfusion Injury in Rats through Reducing Oxidative Stress, Apoptosis and NF- $\kappa$ B Expression

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**SUMMARY.** This work aimed to evaluate the effect of curcumin on lung ischemia-reperfusion injury (LIRI) in rats and explore the related mechanisms. Fifty Sprague Dawley rats were randomly divided into sham group, model group, and 50, 100, and 200 mg/kg curcumin groups. At 1 h before modeling, the latter three groups were intraperitoneally injected with 50, 100, and 200 mg/kg curcumin, respectively. The LIRI (ischemia for 1 h, followed by reperfusion for 2 h) model was established in latter for groups. At the end of reperfusion, compared with model group, in curcumin groups the arterial partial pressure of carbon dioxide was significantly decreased, the arterial partial pressure of oxygen was significantly increased, the lung wet weight to dry weight ratio was significantly decreased, the serum malondialdehyde level and myeloperoxidase activity were significantly decreased, the lung tissue superoxide dismutase and catalase activities were significantly increased, the lung apoptosis index was significantly decreased, and the lung tissue nuclear factor-kappa B (NF- $\kappa$ B) p65 protein expression level was significantly decreased. In conclusion, curcumin has a protective effect on LIRI in rats. The action mechanism may be related to its reducing of oxidative stress, apoptosis and NF- $\kappa$ B expression.

**RESUMEN.** Este trabajo tuvo como objetivo evaluar el efecto de la curcumina en la lesión por isquemia-reperfusion pulmonar (LIRI) en ratas y explorar los mecanismos relacionados. Cincuenta ratas Sprague Dawley se dividieron aleatoriamente en grupo simulado, grupo modelo y grupos de curcumina de 50, 100 y 200 mg kg. Una hora antes del modelado, los últimos tres grupos fueron inyectados intraperitonealmente con 50, 100 y 200 mg/kg de curcumina, respectivamente. El modelo LIRI (isquemia durante 1 h, seguido de reperfusion durante 2 h) se estableció en este último para los grupos. Al final de la reperfusion, en comparación con el grupo modelo, en los grupos de curcumina la presión parcial arterial de dióxido de carbono disminuyó significativamente, la presión parcial de oxígeno arterial aumentó significativamente, la relación peso húmedo pulmonar a peso seco disminuyó significativamente, el nivel de malondialdehído sérico y la actividad mieloperoxidasa disminuyeron significativamente, las actividades de superóxido dismutasa y catalasa del tejido pulmonar aumentaron significativamente, el índice de apoptosis pulmonar disminuyó significativamente y el nivel de expresión de la proteína p65 factor nuclear kappa B (NF- $\kappa$ B) p65 disminuyó significativamente. En conclusión, la curcumina tiene un efecto protector sobre LIRI en ratas. El mecanismo de acción puede estar relacionado con su reducción del estrés oxidativo, la apoptosis y la expresión de NF- $\kappa$ B.

**KEY WORDS:** apoptosis, curcumin, lung ischemia-reperfusion injury, NF- $\kappa$ B, oxidative stress.

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