

## Effect of Penehyclidine Hydrochloride on Traumatic Acute Lung Injury in Rats

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**SUMMARY.** In this study, we investigated the therapeutic effect of penehyclidine hydrochloride on experimental traumatic acute lung injury (ALI) and its possible action mechanism. The rats were randomly divided into sham, model and treated groups. The traumatic ALI model was established in model and treated groups. Then, the treated group was treated with 1 mg/kg penehyclidine hydrochloride by intraperitoneal injection. Within 8 h from treatment, the survival rate of rats in treated group was significantly higher than model group. At the end of experiment, compared with model group, in treated group the pH and PaO<sub>2</sub> parameters were significantly increased, the PaCO<sub>2</sub> parameter was significantly decreased, the lung index and lung wet weight to dry weight ratio were significantly decreased, the serum tumor necrosis factor- $\alpha$  and interleukin-6 levels in treated group were significantly decreased, the lung tissue superoxide dismutase activity was significantly increased, the malondialdehyde content was significantly decreased, the lung tissue apoptotic index was significantly decreased, and the B-cell lymphoma 2/B-cell lymphoma 2 associated X ratio was significantly increased. Penehyclidine hydrochloride has protective effect on traumatic ALI in rats. The action mechanism of penehyclidine may be related to its reducing inflammatory response, oxidative stress and lung tissue apoptosis.

**RESUMEN.** En este estudio investigamos el efecto terapéutico del clorhidrato de penehyclidina en la lesión pulmonar aguda traumática experimental (ALI) y su posible mecanismo de acción. Las ratas se dividieron aleatoriamente en grupos falso, modelo y tratados. El modelo ALI traumático se estableció en los grupos modelo y tratados. Luego, el grupo tratado se trató con 1 mg/kg de clorhidrato de penehyclidina mediante inyección intraperitoneal. Dentro de las 8 h del tratamiento, la tasa de supervivencia de las ratas en el grupo tratado fue significativamente mayor que el grupo modelo. Al final del experimento, en comparación con el grupo modelo, en el grupo tratado los parámetros de pH y PaO<sub>2</sub> aumentaron significativamente, el parámetro PaCO<sub>2</sub> disminuyó significativamente, el índice pulmonar y la relación peso húmedo/peso seco pulmonar disminuyeron significativamente, el factor de necrosis tumoral sérica y los niveles del factor- $\alpha$  e interleucina-6 en el grupo tratado disminuyeron significativamente, la actividad de superóxido dismutasa del tejido pulmonar aumentó significativamente, el contenido de malondialdehído disminuyó significativamente, el índice apoptótico del tejido pulmonar disminuyó significativamente y la relación del linfoma de células B2/linfoma celular B-2 asociada al X aumentó significativamente. El clorhidrato de penehyclidina tiene un efecto protector sobre el ALI traumático en ratas. El mecanismo de acción de la penehyclidina puede estar relacionado con su respuesta inflamatoria reductora, el estrés oxidativo y la apoptosis del tejido pulmonar.

**KEY WORDS:** acute lung injury, penehyclidine hydrochloride, traumatic.

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