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Dexmedetomidine Improves Lung Injury Induced by Asthma: *In Vivo* Study

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***SUMMARY*. The aim of this study is to explain the effects and mechanism of dexmedetomidine in lung injury induced by asthma treatment in vivo study. SD rats were divided into 5 groups as NC, Model, LD, MD, and HD groups. The rats of difference groups were treated by difference methods for 4 weeks and the pathology, cell apoptosis, and relative proteins (TLR4 and NF-κB) of difference groups were evaluated by HE, TUNEL, and IHC assays. The IL-1β, IL-6, and TNF-α concentrations of serum were collected and measured by ELISA assay in difference groups. Compared with NC group, IL-1β, IL-6, and TNF-α concentrations of Model group were significantly increased (P < 0.001, respectively); the pathology and cell apoptosis rate of Model group were significantly enhanced and TLR4 and NF-κB proteins expression were significantly up-regulated (P < 0.001). With dexmedetomidine supplement, the IL-1β, IL-6, and TNF-α concentrations were significantly down-regulated (P < 0.05, respectively); the pathology and cell apoptosis were significantly improved and TLR4 and NF-κB proteins expressions were significantly suppressed (P < 0.05, respectively) compared with Model group. Dexmedetomidine could improve lung injury induced by asthma via regulation TLR4/NF-κB signal pathway.**

RESUMEN. El objetivo de este estudio es explicar los efectos y el mecanismo de la dexmedetomidina en la lesión pulmonar inducida por el tratamiento del asma en un estudio in vivo. Ratas SD se dividieron en 5 grupos: NC, Modelo, LD, MD y HD. Las ratas de los diferentes grupos se trataron mediante diferentes métodos durante 4 semanas y la patología, la apoptosis celular y las proteínas relativas (TLR4 y NF-κB) de los diferentes grupos se evaluaron mediante los ensayos de HE, TUNEL e IHC. Las concentraciones de suero de IL-1β, IL-6 y TNF-α se midieron mediante un ensayo ELISA en los diferentes grupos. En comparación con el grupo NC, las concentraciones de IL-1β, IL-6 y TNF-α del grupo modelo aumentaron significativamente (P < 0,001, respectivamente); la patología y la tasa de apoptosis celular del grupo modelo aumentaron significativamente y las proteínas TLR4 y NF-κB expresaron una regulación positiva (P < 0,001). Con el suplemento de dexmedetomidina, las concentraciones de IL-1β, IL-6 y TNF-α se redujeron significativamente (P < 0.05, respectivamente), la patología y la apoptosis celular mejoraron significativamente y las expresiones de las proteínas TLR4 y NF-κB se suprimieron significativamente (P < 0,05, respectivamente) en comparación con el grupo modelo. La dexmedetomidina podría mejorar la lesión pulmonar inducida por el asma a través de la regulación de la vía de señalización TLR4/NF-κB.

KEY WORDS: dexmedetomidine, IL-1β, IL-6, lung injury, NF-κB, TLR4, TNF-α.

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