

Zerumbone Alleviates Acute Pancreatitis in Rats by Reducing Inflammatory Reaction and Oxidative Stress and Regulating TLR4/NF-κB Signaling Pathway

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SUMMARY. This study was designed to investigate the protective effect of zerumbone on acute pancreatitis in rats and to clarify the underlying mechanisms. Forty-eight rats were randomly divided into control, zerumbone, model and model+zerumbone groups, 12 rats in each group. The acute pancreatitis model was established in model and model+zerumbone groups by biliopancreatic duct injection with sodium taurocholate. Then, the zerumbone and model+zerumbone groups were treated with 10 mg/kg zerumbone by femoral vein puncture for two times. After 6 h from the last treatment, compared with model group, in model+zerumbone group, the acute pancreatitis symptoms were obviously alleviated, the wet pancreatic weight and pancreatic histopathological score were decreased ($P < 0.05$), the serum amylase and phospholipase A2 activities were decreased ($P < 0.05$), the serum tumor necrosis factor- α , interleukin 1 β , interleukin 6 and monocyte chemoattractant protein levels were decreased ($P < 0.05$), the pancreatic tissue superoxide dismutase and catalase levels were increased ($P < 0.05$), the pancreatic tissue reactive oxygen species and malondialdehyde levels were decreased ($P < 0.05$), and the pancreatic tissue Toll-like receptor 4 (TLR4) and nuclear factor-kappa B (NF- κ B) p65 protein expression levels were decreased ($P < 0.05$). In conclusion, zerumbone can alleviate the acute pancreatitis in rats by reducing inflammatory reaction and oxidative stress and regulating TLR4/NF- κ B signaling pathway.

RESUMEN. Este estudio fue diseñado para investigar el efecto protector de zerumbona sobre la pancreatitis aguda en ratas y para aclarar los mecanismos subyacentes. Cuarenta y ocho ratas se dividieron aleatoriamente en grupos control, zerumbona, modelo y modelo+zerumbona, 12 ratas en cada grupo. El modelo de pancreatitis aguda se estableció en los grupos modelo y modelo + zerumbona mediante inyección en el conducto biliopancreático con taurocolato de sodio. Luego, los grupos zerumbona y modelo+zerumbona se trataron con 10 mg/kg de zerumbona mediante punción venosa femoral dos veces. Después de 6 h del último tratamiento, en comparación con el grupo modelo, en el grupo modelo+zerumbona, los síntomas de pancreatitis aguda se aliviaron obviamente, el peso pancreático húmedo y la puntuación histopatológica pancreática disminuyeron ($P < 0.05$), las actividades de amilasa sérica y fosfolipasa A2 disminuyeron ($P < 0.05$), disminuyeron los niveles séricos de factor de necrosis tumoral α , interleucina 1 β , interleucina 6 y proteína quimioatrayente de monocitos ($P < 0.05$), aumentaron los niveles de superóxido dismutasa del tejido pancreático y catalasa ($P < 0.05$), las especies de oxígeno reactivo del tejido pancreático y los niveles de malondialdehído disminuyeron ($P < 0.05$), y los niveles de expresión de la proteína p65 del receptor de células Toll-like 4 (TLR4) y factor nuclear-kappa B (NF- κ B) p65 disminuyeron ($P < 0.05$). En conclusión, la zerumbona puede aliviar la pancreatitis aguda en ratas al reducir la reacción inflamatoria y el estrés oxidativo y regular la vía de señalización TLR4/NF- κ B.

KEY WORDS: acute pancreatitis, inflammatory reaction, NF- κ B, oxidative stress, rats, TLR4, zerumbone.

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