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Exercise regulates HMGB1 / TLR4 / NF- κ B pathway by H₂S to improve OJ intestinal injury

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Objective To study the effect of aerobic exercise on the damage of intestinal mucosal barrier function caused by obstructive jaundice (OJ) and to explore its mechanism of action.

Methods 50 male KM mice were randomly divided into 5 groups: sham operation group (S), model group (M), exercise group (TM), DL-Propargylglycine + exercise (PT) group and sodium hydrosulfide + exercise (NT) group. In addition to the S group which are in the common bile duct to the abdominal wall hanging 48 hours to build mouse obstructive jaundice model. In the PT group, PAG (40 mg/kg) was intraperitoneally injected 7 days after surgery; NaHS (50 μ mol/kg) was intraperitoneally injected in the NT group 7 days after surgery; TM group, NT group and PT group were graded at 0%, and the speed was 10m/min no weight training (30min/day). After 6 weeks, HE staining was used to observe the morphological changes of the intestinal mucosa. Biochemical analysis was used to detect the concentration of hydrogen sulfide (H₂S) in blood and ileum, and total bilirubin (TBIL), alanine aminotransferase (ALT), and aspartate aminotransferase (AST) Liver function, diamine oxidase (DAO), D-lactic acid intestinal barrier function biochemical index; qRT-PCR and immunohistochemical staining were used to observe the expression changes of H₂S-mediated related channel mRNA and protein (HMGB1, TLR4 and NF-Kbp6) in intestinal tissues.

Results HE staining showed that the intestinal mucosa of group M was atrophied and the villus was broken. Compared with M group, the intestinal mucosa arrangement in TM group was relatively regular. Compared with TM group, intestinal mucosa atrophy in PT group, fluff hair loss, sparseness and disorder, partial mucosa The layer was separated from the lamina propria and the gland was severely damaged. The intestinal mucosa of the NT group was relatively regular, and the changes of intestinal mucosa atrophy were restored. Serum test results showed that H₂S levels were higher in the TM group than in the M group; compared with the TM group, the PT group decreased and the NT group increased. DAO level: The TM group was lower than the M group; compared with the TM group, the PT group was elevated and the NT group was decreased. Changes in serum D-lactic acid levels were similar to DAO. The results of qRT-PCR and immunohistochemical staining showed that the expressions of HMGB1, TLR4 and NF-Kbp6 mRNA and protein in the intestinal tissues of mice in TM group were significantly lower than those in M group and PT group, and the mRNA and protein expression levels in NT group were the lowest.

Conclusions Aerobic exercise inhibits the HMGB1 / TLR4 / NF- κ B signaling pathway through the H₂S / CSE system, thereby exerting a protective effect on the intestinal mucosal barrier.