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Montmorillonite adsorbs uric acid and increases the excretion of uric acid from the intestinal tract in mice.

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Abstract

OBJECTIVES: The aim was to evaluate the adsorbing effect of montmorillonite on uric acid, promoting diffusion of uric acid from blood to intestine, preventing absorption of uric acid in intestine and reducing uric acid level in serum.

METHODS: The adsorbing effect of montmorillonite on uric acid was observed in vitro. The intestine and blood vessel of rats were circularly perfused with intestinal perfusate and vascular perfusate, respectively. A model of hyperuricaemia in mice was prepared by intraperitoneal injection of hypoxanthine and potassium oteracil. The concentration of uric acid was determined by the method of urate oxidase and peroxide enzyme.

KEY FINDINGS: The results showed that different concentrations of montmorillonite could adsorb uric acid in a concentration-dependent manner. The adsorbing effect was fast. The adsorptive rate was high in acid solution and was low in alkaline solution. When blood vessels were circularly perfused by vascular perfusate containing uric acid, the concentration of uric acid in vascular perfusate was decreased and the concentration of uric acid in intestinal perfusate was increased, suggesting that uric acid in blood vessels diffused into the intestine. When the intestine was perfused with intestinal perfusate containing uric acid, the uric acid concentration in vascular perfusate was increased, but the uric acid concentration of intestinal perfusate was decreased, suggesting that uric acid was absorbed in the intestine. The uric acid concentrations of intestinal perfusate and vascular perfusate in montmorillonite 0.5 and 1.0 g/kg groups were lower than the control group. Concentrations of uric acid in serum and urine in the montmorillonite 1 and 2 g/kg groups were lower compared with mice in the hyperuricaemic group.

CONCLUSIONS: The results suggested that montmorillonite adsorbed uric acid and promoted diffusion of uric acid from blood vessels to intestine, prevented absorption of uric acid in intestine and decreased uric acid level in serum.

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