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Antithrombotic Effects of Hirudin in Mice and Study of its Mechanism

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***SUMMMARY*. The aim was to study the antithrombotic effects of hirudin and to explore its mechanism from anticoagulant action and fibrinolysis. Three experimental models, including mouse tail bleeding model, mouse tail thrombosis model and inferior vena cava thrombosis model were established. The mice were randomly divided into 3 groups (9 mice per group): normal control (NC) or Model group (0.5% CMC-Na) gavage once daily for 15 days, Treatment group (hirudin, 174 mg/kg). The SD rats were randomly divided into 3 groups (9 rats per group): normal control (NC, 0.9% NaCl), Model group (0.5% CMC-Na) and Treatment group (hirudin 174 mg/kg), gavage once daily for 15 days. The pathological changes of inferior vena cava tissues were observed by light microscope. The prothrombin time (PT), activated partial thromboplastin time (APTT) and contents of tissue type plasminogen activator (t-PA) and plasminogen activator inhibitor-1 (PAI-1) were measured. Compared with Model group, The PT and APTT of Treatment group were significantly prolonged ($P < 0.05$, respectively). The release of t-PA was promoted and the release of PAI-1 was inhibited. There is a significant antithrombotic effects about hirudin and its mechanism may be related to increasing the activity of the anticoagulant factor and fibrinolysis system.**

RESUMEN. El objetivo fue estudiar los efectos antitrombóticos de la hirudina y explorar su mecanismo a partir de la acción anticoagulante y la fibrinólisis. Se establecieron tres modelos experimentales, que incluyen el modelo de hemorragia de la cola del ratón, el modelo de trombosis de la cola del ratón y el modelo de trombosis de la vena cava inferior. Los ratones fueron divididos aleatoriamente en 3 grupos (9 ratones por grupo): control normal (NC) o grupo modelo (0.5% CMC-Na) una vez al día durante 15 días, grupo de tratamiento (hirudina, 174 mg/kg). Las ratas SD se dividieron aleatoriamente en 3 grupos (9 ratas por grupo): control normal (NC, 0,9% NaCl), grupo modelo (0,5% CMC-Na) y grupo de tratamiento (hirudina 174 mg/kg), sonda nasogástrica una vez al día durante 15 días. Los cambios patológicos de los tejidos de la vena cava inferior se observaron con un microscopio óptico. Se midieron el tiempo de protrombina (PT), el tiempo de tromboplastina parcial activada (APTT) y el contenido del activador del plasminógeno tipo tisular (t-PA) y el inhibidor del activador del plasminógeno-1 (PAI-1). Comparado con el grupo Modelo, el grupo PT y APTT del Tratamiento se prolongaron significativamente ($P < 0.05$, respectivamente). Se promovió la liberación de t-PA y se inhibió la liberación de PAI-1. Existe un importante efecto antitrombótico sobre la hirudina y su mecanismo puede estar relacionado con el aumento de la actividad del factor anticoagulante y el sistema de fibrinólisis.

KEY WORDS: antithrombotic effects, hirudin, mechanism.

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