

土鳖虫对大鼠血液流变学的影响

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摘要 土鳖虫提取液连续给大鼠灌胃10d,可使血球压积,全血高切粘度,全血低切粘度,RBC聚集指数,RBC刚性指数均明显降低。使RBC沉降率,血沉方程常数明显升高。对血浆粘度,纤维蛋白原含量无影响。说明土鳖虫主要是通过影响RBC发挥降低血液粘度作用的。

关键词 土鳖虫 血液流变学

土鳖虫为张仲景大黄廑虫丸中4味破血虫药之一。功能逐瘀、破积、通络、理伤。常用于治疗症瘕积聚、血滞经闭、产后瘀血腹痛、跌打损伤等血症^[1]。近年来,文献报道^[2],土鳖虫水提物能明显延长大鼠出血时间和复钙时间,显著抑制血小板聚集率、缩短RBC电泳时间。本文根据血症的特点,观察了该药对大鼠血液流变学的影响。

1 材料

药物:土鳖虫经鉴定为鳖蠊科昆虫地鳖*Eupolyphaga sinensis* Walker。本实验采用土鳖虫经加工处理后的水浸膏,由本院植化室提供。阳性对照药为脑血康口服液,公主岭红光制药厂生产,批号:910406。

动物:Wistar大鼠、体重350~400g,雌雄各半,由吉林省中医中药研究院动物室提供。

仪器:WTP-B1型毛细管粘度计。

2 方法与结果

2.1 土鳖虫对大鼠血球压积的影响:大鼠50只,等分5组,按表1灌胃给药,每天一次,连续10d。空白对照组给同体积蒸馏水。于末次给药后1h断头取血、按文献方法^[3]测定血球压积,结果见表1。

2.2 土鳖虫对大鼠全血高切粘度,RBC刚性指数的影响:大鼠50只,分组与给药方法同前,按文献方法^[4]测定全血高切粘度,RBC刚性指数,结果见表2。

表1 土鳖虫对大鼠血球压积的影响 ($\bar{x} \pm SD$)

组别	n	剂量(g/kg)	血球压积(%)
低剂量	10	1.34	43.28 ± 2.48
中剂量	10	2.68	42.41 ± 2.19*
高剂量	10	5.36	42.04 ± 1.42**
阳性对照	10	1.35ml/100g	42.36 ± 2.96*
空白对照	10	1.35ml/100g	45.25 ± 2.80

注:与空白对照组比较 * $P < 0.05$ ** $P < 0.01$

表2 土鳖虫对大鼠全血高切粘度、RBC刚性指数的影响 ($\bar{x} \pm SD$)

组别	n	剂量(g/kg)	全血高切粘度	RBC刚性指数
低剂量	10	1.34	5.57 ± 0.41	5.51 ± 0.81 ^{ΔΔ}
中剂量	10	2.68	4.85 ± 0.80	4.96 ± 0.92**
高剂量	10	5.36	4.59 ± 0.31	4.56 ± 0.35**
阳性对照	10	1.35ml/100g	4.65 ± 0.29	4.57 ± 0.21**
空白对照	10	1.35ml/100g	7.48 ± 1.44	7.63 ± 0.98

与空白对照组比较 ** $P < 0.01$

与阳性对照组比较 ^{ΔΔ} $P < 0.01$

2.3 土鳖虫对大鼠全血低切粘度、RBC聚集指数的影响:大鼠50只,分组与给药方法同前,按文献方法^[4]测定全血低切粘度、RBC聚集指数,结果见表3。

2.4 土鳖虫对大鼠血浆粘度、纤维蛋白原的影响:大鼠50只,分组与给药方法同前,测定血浆粘度^[4]、纤维蛋白原含量^[5]。结果见表4。

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2.5 土鳖虫对大鼠RBC沉降率、血沉方程常数的影响：大鼠50只，分组与给药方法同前，按文献方法^[4]测定RBC沉降率、血沉方程常数。结果见表5。

表3 土鳖虫对大鼠全血低切粘度，RBC聚集指数的影响 ($\bar{x} \pm SD$)				
组别	n	剂量(g/kg)	全血低切粘度	RBC聚集指数
低剂量	10	1.34	8.30±0.71** $\Delta\Delta$	1.49±0.11** $\Delta\Delta$
中剂量	10	2.68	6.84±1.59**	1.40±0.13** Δ
高剂量	10	5.36	6.50±0.45**	1.42±0.12** Δ
阳性对照	10	1.35ml/100g	6.01±0.61**	1.29±0.08**
空白对照	10	1.45ml/100g	12.58±3.09	1.68±0.19
与空白对照组比较 * $P<0.05$ ** $P<0.01$				
与阳性对照组比较 $\Delta P<0.05$ $\Delta\Delta P<0.01$				

3 讨论

现代血液流变学认为，全血粘度是反映血液流动性和粘滞性的重要指标。全血粘度增高往往导致循环减慢以及组织氧饱和程度降低，影响血液粘度的因素很多，其中影响最大的是血液中的红细胞，红细胞压积直接影响着血液的粘度。压积越大，全血粘度越高，同时认为红细胞聚集性主要影响低切变率时的血液粘度。低切速下的全血粘度越高，说明红细胞聚集性越强，而红细胞变形性对血液粘度的影响则在高切变率时更为明显^[6,7]。高切速下的全血粘度愈高，说明红细胞变形能力愈差。本文实验结果表明，土鳖虫提取液能显著降低RBC压积，降低全血高切粘度，全血低切粘度。降低RBC聚集指数和RBC刚性指数。而对血浆粘度、纤维蛋白原含量无明显影响，说明该药主要是通过影响红细胞来发挥作用的，在降低RBC压积，降低RBC聚集性、增强RBC变形能力的同时，随着RBC压积的显著降低、RBC沉降率与血沉方程常数明显增大，从而使血液粘度降低。这对改善和增强体内重要器官，组织及全身的血液供应起到一定作用，与祖国医学“该药破血逐瘀”记载的理论相一致。

表4 土鳖虫对大鼠血浆粘度、纤维蛋白原含量的影响 ($\bar{x} \pm SD$)				
组别	n	剂量(g/kg)	血浆粘度	纤维蛋白原(%)
低剂量	10	1.34	1.66±0.14	272.40±38.80
中剂量	10	2.68	1.56±0.08	259.80±41.57
高剂量	10	5.36	1.57±0.08	274.20±39.09
阳性对照	10	1.35ml/100g	1.59±0.05	300.00±45.34
空白对照	10	1.35ml/100g	1.67±0.17	290.40±56.30

表5 土鳖虫对大鼠RBC沉降率、血沉方程常数的影响 ($\bar{x} \pm SD$)				
组别	n	剂量(g/kg)	RBC沉降率(mm/h)	血沉方程常数
低剂量	10	1.34	5.58±4.80*	20.32±16.61*
中剂量	10	2.68	7.08±5.52**	24.54±18.13**
高剂量	10	5.36	10.63±5.52**	38.18±20.31**
阳性对照	10	1.35ml/100g	7.77±3.89**	26.71±11.76**
空白对照	10	1.35ml/100g	1.56±1.47	5.97±4.70

与空白对照组比较 * $P<0.05$ ** $P<0.01$

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Effects of Ground Beetle on Blood Rheology of Rats

Zhou Chunfeng, Lai Meng, Wang Xiuhua, et al

Extract of Ground Beetle was found to affect rat rheology, when given orally to rats for 10 consecutive days, it resulted in the lowering of packed corpuscular volume, high and low whole blood shear viscosity, RBC aggregation and rigidity indices and sedimentation rate, but the constant of SR equation was raised and without effect on plasma viscosity and fibrinogen content. These results suggested that the effect of ground beetle extract is by way of its action on RBC.

(Original article on page 28)

Morphological and Histological Studies on Folium and Stem of *Potentilla*

Yang Bin and Yue Chongxi

Morphological and histological characters of the leaves and stems of 6 species of *Potentilla* (*Potentilla fragarioides*, *P. discolor*, *P. chinensis*, *P. 'kleiniana*, *P. freyniana*, *P. anserina*) are described and compared for the first time. Some Characters such as the form of glandular trichomes on stems; the form of trichomes on leaves and stems; the stomatal index of lower surface of leaves and the palisade ratio play important roles in the differentiation among the 6 species. The glandular trichome is reported for the first time.

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Effect of K_{La}° on Ginseng (*Panax ginseng*) Cell Culture

Ding Jiayi, Cai Jun, Zhao Chongde, et al

Cell culture of Ginseng (*Panax ginseng*) was conducted under different K_{La}° , with other conditions kept constant. Results showed that the best range of K_{La}° for Ginseng cell culture was $18 \sim 27 h^{-1}$.

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Study on the Cultural Practice of New Hybrid Yuanhu

Xu Zhaoxi, Li Ailian, and Wei Jianhe

Some cultural practices of a new hybrid yuanhu were reported. The planting density of the new variety was, using small seed tubers (2.8g/Per tuber), $50 \sim 75$ tubers/ m^2 for reproduction purpose, 100 tubers/ m^2 for high yield. 75 tubers/ m^2 was a suitable density when large or middle seed tubers was used. High reproduction coefficient and yield were obtained when the planting depth was 10cm. It was necessary to irrigate the hybrid yuanhu in North China. Adopting the negative pressure value of soil humidometer as the guide of beginning to irrigate and to obtain high reproduction coefficient and to save water, 26.7kPa would be adopted as the initial point of irrigation, exceeding 40.0 kPa led to a serious reduction of yield. The difference of yield between roller roller irrigation and drip irrigation treatment was not obvious, when planting with covering straw in level bed.

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