

# 夏枯草总皂甙对麻醉大鼠急性心肌梗死的保护作用及降血压作用

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**摘要** 从夏枯草中提取夏枯草总皂甙(PVS),PVS 40mg/kg腹腔注射对麻醉大鼠lgPVC,lg(VT + VF)及心律失常得分,较对照组有显著减少。20mg/kg腹腔注射对麻醉大鼠冠脉结扎后4h,心肌梗死范围较对照组有缩小,2.5mg/kg静脉注射开始对麻醉大鼠的舒张压和收缩压有显著下降。

**关键词** 夏枯草总皂甙 心肌梗死 降血压 心律失常

夏枯草是唇形科 *Labiatae*夏枯草属 *Prunella*L.植物。具有抗肿瘤、降压、抗炎、抗菌、利尿等作用。夏枯草的降压作用过去一直认为可能是夏枯草中含有大量KCl引起,本文通过从夏枯草中提取夏枯草总皂甙(PVS)证明夏枯草的降压作用可能与PVS有关,并证明PVS具有对麻醉大鼠心肌有保护作用。

## 1 材料

1.1 夏枯草总皂甙的制备:取夏枯草*P.vulgaris* L.1kg,用95%乙醇提取2次。提取液合并,回收溶液得乙醇提取部分。加等量氯仿,除去杂质,溶液浓缩至膏状,用水饱和正丁醇液提取。经反复水洗,水饱和正丁醇萃取除去K<sup>+</sup>,得夏枯草总皂甙(Total Saponina of *Prunella Vulgaris*, PVS)。

1.2 动物和试剂、仪器:雄性SD大鼠,购自上海市计划生育研究所;PVS、氯化硝基四氮唑蓝(NBT,上海前进试剂厂,批号:900503),用前以磷酸缓冲液(pH7.4)配成0.05%溶液。四通生理记录仪RM6200C型(成都仪器厂)。

## 2 方法

2.1 PVS对麻醉大鼠急性心肌梗死的保护作用:冠状动脉结扎方法:取体重210±s19g大鼠,以3%戊巴比妥钠60mg/kg,腹腔注射麻醉大鼠,右颈动脉插管监测动脉血压,气管插管行人工呼吸,经左侧第4肋间开胸,剪开心包并以止血钳夹持心包,暴露心脏及左室表面血管,以肺动脉圆锥及左心耳交界处的左冠状静脉为标志。用3/8Cr3×6规格的不锈钢园针,3~0丝线穿过左心耳下的心肌浅层,穿线后稳定15min,如出现心律失常或动脉收缩压低于9.31kPa,持续超过5min则废除该动物,手术前腹腔注射PVS,给药组按PVS剂量分为20、40mg/kg 2组。结扎冠状动脉,从给药到冠脉结扎1h,记录心电图及血压变化。结扎后4h取心脏用生理盐水洗净血液用于染色。

心律失常的评价:心律失常严重程度以结扎后30min出现的室性早搏个数(Premature Ventricular Contraction, PVC)的对数值lg PVC,室速与室颤(Ventricular Tachycardia and Ventricular Fibrillation, VT and VF)的总时程的对数值lg(VT + VF),心律失常记分表示用改良Johuston心律失常记分法<sup>[1]</sup>。

硝基四氮唑蓝染色见Brody方法。

2.2 PVS的降血压作用:PVS配成0.625、1.25、2.5、5、10mg/ml备用。取205±S 25g大鼠,3%巴比妥钠麻醉,分离大鼠左侧股动脉和股静脉,股动脉连接四通生理记录器,并

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接通血压心率仪，静脉插入充满肝素化（200IU/ml）生理盐水导管，导管经转动装置与瓣注三通管相连，以1ml/kg的剂量分别静注PVS，从小浓度到大浓度。每剂量观察5min，PVS的量以累加剂量计算。

统计方法：用t检验统计。

### 3 结果

3.1 冠脉结扎后心电图改变：QRS波于结扎即刻或1~2s后增宽、增高，并于60s左右达高峰，随后QRS波逐渐变小，ST段逐渐抬高，于5~7min时ST段抬高达高峰，并出现明显的心律失常。常见的心律失常有PVS，VT+VF，偶有房室传导阻滞，给药组中20mg/kg组心律失常记分，lg PVC和lg(VT+VF)，未达显著水平；40mg/kg时上述三者较对照组显著减小，见表1。

3.2 冠脉结扎后4h心肌梗死范围及死亡率：治疗组心梗范围较对照组有缩小，40mg/kg组降低梗死范围显著，见表2。

3.3 大鼠经注射PVS后在很短的时间内，有一个迅速的血压下降和回升过程，在3~4min里，又可见血压下降，到5min后基本恢复正常，每一剂量的血压变化见表3。

### 4 讨论与小结

4.1 实验表明，PVS可降低大鼠急性心肌梗死范围，降低早期死亡率，减少心律失常的发生率。

4.2 PVS在2.5mg/kg剂量开始具有显著的降压作用。总皂甙的对数剂量与舒张压、收缩压具有显著的相关性，相关系数r分别为-

表1 冠脉结扎后30min PVS对心律失常的影响( $\bar{x} \pm S$ )(n=10)

分组 (mg/kg)	lg PVC	lg(VT+VF)	心律失常范围
PVS 0	2.3±0.25	2.2±1.24	4.0±1.69
20	2.3±0.41	2.1±1.04	3.7±0.98
40	1.3±0.92**	0.5±0.76**	1.5±1.65**

\*P<0.05 \*\*P<0.01 (下同)

表2 冠脉结扎后4h PVS对心肌梗死及死亡率的影响

分组(mg/kg)	心肌梗塞范围 (重量%)	死亡率 (%)
PVS 0	33±6.1(n=7)	30(3/10)
20	28±6.5(n=8)	20(2/10)
40	25±4.6**(n=10)	0*

表3 PVS对血压的影响 (n=7)

PVS(mg/kg)	正常	0.625	1.25	2.5	5	10
舒张压(kPa)	99.1±7.6	93.3±9.1	92.9±11.1	85.8±13.2*	83.7±18.4	78.4±18.1**
收缩压(kPa)	145.1±10.5	137.1±11.4	134.6±13.3	131.1±17.5*	129.9±19.4*	123.1±23.7*
心率 次/min	359.4±48.8	369.9±46.8	364.9±38.8	365.4±43.4*	366.7±47.9	369.3±57.3

0.98和-0.97 (n=6, P<0.01)。

4.3 夏枯草的降压成分是K<sup>+</sup>还是其它成分，一直没有解释清楚<sup>[3]</sup>。从本文结果看，夏枯草的降压作用与总皂甙有关。

### 参 考 文 献

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spectrometry and TLC scanning. Results showed that the total amount of catechol like constituents in injections obtained from the market varies differently. It was proved that all the injections contained a large amount of tannins can lead to degeneration of red blood cells and agglutination of plasma protein and cause clinical toxic actions.

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### On the Effect of Total Saponins from Common Selfheal (*Prunella vulgaris*) On Experimental Myocardial Infarction and Hypertension of Anesthetized Rats

Wang Haiho, Zhang Zhiyu, Su Zhongwu, et al

Effects of total saponins from *Prunella vulgaris* (PVS) on acute myocardial infarction and hypertension of anesthetized rats were assessed. Pretreatment with PVS at a dose of 40mg/kg ip lowered Lg PVC, Lg (VT+VF) and ischemic arrhythmic scores; at a dose of 20mg/kg ip, resulted in a significant reduction of infarct size as compared with the controls; 2.5mg/kg iv showed an hypotensive action to both systolic and diastolic blood pressure.

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### Antiinflammatory Effects of Alcohol Extract of Daoguaniou (*Caesalpinia sepiaria* var. *pubescens*)

Li Le, Zhuang Feier, Li Zengli, et al

Antiinflammatory effects of alcohol extract of *Caesalpinia sepiaria* Roxb. var. *pubescent* Tang et wang were shown by ip injection. The extract significantly decreased xylene induced swelling of mice ear; carrageenin produced edema of hind paw in rats, and decreased volume of pleural exudate on carrageenin-induced acute pleurisy of rats. It also inhibited egg white induced arthritis in rats. LD<sub>50</sub> value is 303.7mg/kg by ip in mice, confidence limit of 95% is 296.5±189.4mg/kg.

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### Experimental Study on Anti-Lipid-Peroxidation of Japanese Raisin Tree (*Hovenia dulcis*)

Wang Yanlin, Han Yu, Qian Jingping

Anti-Lipid-Peroxidation of *Hovenia dulcis* Thunb. in mice was studied. Results showed that *H. dulcis* Thunb. had the following functions: 1. decrease MAD contents of serum and tissues of liver and brain. 2. increase SOD activity in tissues of liver, kidney and brain. 3. impart tolerance toward cold and heat, and prolong swimming time of mice. The results indicate that *H. dulcis* Thunb. has function of Anti-Lipid-Peroxidation and may be valuable for the retardation of senility.

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### Preliminary Study on Germinating Conditions of Ural Licorice (*Glycyrrhiza uralensis*)

Yu Linqing, He Maotai

Germinating conditions of *Glycyrrhiza uralensis* Fisch. including temperature, water, pH