

柴胡皂甙对猫睡眠节律电活动调制的实验研究

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摘要 给猫腹腔注射柴胡皂甙注射液1ml/kg和朱砂安神丸1丸灌胃,以眼球运动电图(EOG),大脑皮层电图(EEG),肌电图(EMG)和丘脑外侧膝状体放电(PGO)为电生理学指标,用多导仪连续记录6h。发现柴胡皂甙可延长猫的睡眠时间,特别是慢波睡眠Ⅱ期(ⅡSWS)和快动眼睡眠期(REM)的增加与给药前比较均有非常显著性差异。其作用优于经典的朱砂安神丸。

关键词 柴胡皂甙 慢波睡眠 快动眼睡眠

1 材料和方法

动物:猫10只,体重2.5~3.0kg,雌雄兼有,由实验动物中心提供。

药物:柴胡皂甙注射液(简称柴胡皂甙):由柴胡提取制成,1ml含1g柴胡皂甙。朱砂丸,天津达仁堂制药二厂,批号910612,由天津市急腹症研究所药研室提供。

方法:动物先在特制的隔音屏蔽箱中饲养1周,适应环境后用戊巴比妥钠30mg/kg静注麻醉,开颅并分离颈部肌肉,按放记录EOG,EEG和EMG的电极。在丘脑外侧膝状体部位插入双极绝缘不锈钢电极(座标按Jasper图谱,APO:6.5mm,L9.5mm,H16.5mm,定位仪为日本东大型脑立体定位仪)以记录外侧膝状体放电。各电极引导线与微型插座相连并固定在颅骨上。术后抗感染处理,待动物清醒后,在音箱内饲养(自然光照,室温)一周后实验。

实验时用导线将微型插座与多导仪相连,连续记录6h(10:00—16:00)。根据记录的EOG、EEG和EMG及PGO变化情况,用Rohtschaffen目测法,将猫的睡眠分为清醒期(Wakefulness),慢波睡眠Ⅰ期(I SWS),ⅡSWS和REM^[1]。给药前每只动物连续记录6h,共4次取其均值做为一个变量。给药后①腹腔注射柴胡皂甙1ml/kg,记录4次取均值为给药后的一个变量。②隔5d后1丸朱砂安神丸灌胃连续4次取均值为一个变量。最后验证外侧膝状体电极尖端均在所需部位。实验结果用自身对比法进行t检验。

2 实验结果

2.1 给药前:总睡眠时间平均为106.5min,I SWS为40.1min,ⅡSWS为41.3min,REM为24.8min。

2.2 给药后

2.2.1 腹腔注射2.5ml柴胡皂甙,记录的6h内平均总睡眠时间为204.1min,ISWS为50.3min,ⅡSWS为94.9min,REM56.8min,与给药前相比除ISWS外均有非常显著性差异($P<0.01$)。

2.2.2 朱砂安神丸1丸灌胃,总睡眠时间平均为134.5min,I SWS为72.0min,ⅡSWS为43.0min,REM为19.5min,与给药前比只有I SWS的延长有非常显著性差异($P<0.01$)。

2.2.3 把柴胡皂甙的作用与朱砂安神丸的作用进行比较结果如图。总睡眠时间,ⅡSWS和REM柴胡皂甙的作用强于朱砂安神丸,有非常显著性差异($P<0.01$);I SWS朱砂安神丸的作用优于柴胡皂甙,有显著性差异($P<0.05$)。

3 讨论

本文结果表明,柴胡皂甙和朱砂安神丸都能延长猫的睡眠时间,与给药前比较,前者使

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总睡眠时间、I SWS和REM的延长都有非常显著性差异 ($P<0.01$), 而后者只能使ISWS明显延长 ($P<0.01$)。我们对柴胡皂甙的作用与朱砂安神的作用进行比较, 发现柴胡皂甙对总睡眠时间, I SWS和REM的作用明显优于朱砂安神丸; 而朱砂安神丸对I SWS的作用反而明显强于柴胡皂甙。一般认为I SWS属于浅睡, 它反映了开始入睡及由浅睡向深睡的转化过程。II SWS属于深睡, 有利体力的恢复。REM是睡眠特殊时相, 在该时相通过调节脑细胞的功能活动及蛋白质的合成可使精力得以恢复。朱砂安神丸对I SWS的效应, 表明该药可促进入睡, 对II SWS和REM并无明显作用。柴胡皂甙对II SWS和REM的作用, 表明该药有利于体力和精力的恢复。

现代医学研究证明, 柴胡皂甙具有镇静、镇痛和抗惊厥的作用。我国科学工作者发现柴胡制剂对家兔的大脑皮层电活动有抑制作用^[2]。日本学者发现口服柴胡皂甙1ml/kg, 可使大鼠皮层脑电呈抑制反应^[3]。另有学者报道柴胡制剂可压抑由戊四氮引起的动物的兴奋反应, 使行为和脑电均呈压抑性变化。

在神经化学方面的研究, 表明在生理状态下柴胡制剂可使小鼠中脑和延髓内的5-羟色胺 (5-HT) 水平升高^[4], 下丘脑内的去甲肾上腺素 (NE) 升高^[5]。当脑内5-HT升高时, 可使SWS时间延长, NE水平升高, 可使REM时间延长。柴胡皂甙是否通过脑内单胺类物质的变化影响睡眠, 有待进一步研究。

致谢: 本文承吴咸中教授指导和审阅。

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量分别是1.33, 1.24, 2.36μg/g。

本实验测定了31种中草药中锗的含量。结果显示有补益强壮作用的中草药中如补骨脂, 地骨皮、人参、沙苑子等锗含量相对要高于一般药材, 但都处于ppm这一数量级, 差异并不显著。故还不能说这些药材的补益作用与锗含量有关。

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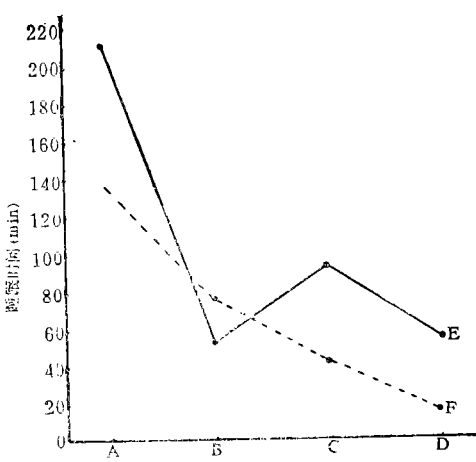


图 柴胡皂甙与朱砂安神丸的作用比较

A-总睡眠时间 B-I SWS时间 C-II SWS D-REM
时间 E-柴胡皂甙的作用 F-朱砂安神丸的作用

Hydride Generation-Second Derivative Spectrometry Determination of Germanium in Chinese Herbs

Yan Runan, Ma Changhua, and Xia Kaiyuan

Traces of Germanium in 31 different species of Chinese medicinal herbs were determined by hydride generation-second derivative spectrometry. The method proved to be simple, with high sensitivity and selectivity and can be used for the determination of Germanium in Chinese medicinal herbs and health care preparation containing Germanium.

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Screening for NGF Active Chinese Medicinal Herbs and Their Active Components

Jiang Liming, Li Zhiming, and Han Baoge

It has been revealed that nerve growth factor (NGF) deficiency is the main cause of some kinds of neuron degenerative diseases such as Alzheimer's disease, and NGF administration can protect neuronal function decay and promote nerve regeneration. Moreover, NGF actions are mediated by its receptors. In the present study, ^{125}I -NGF receptor binding assay was used as a model for the screening of NGF receptor active components from 14 Chinese medicinal herbs. It was found that a component from the root of *Achyranthes bidentata* BI. possesses such inhibitory activity with $\text{IC}_{50} = 6.18 \pm 3.43 \mu\text{g/ml}$.

(Original article on page 79)

Studies on the Effect of Saikosaponins on Brain Electrical Activities of Sleep in Cat

Sun Bing, Hao Hongqian, Zheng Kaijun, et al

Effect of saikosaponins on sleep [slow wave-stage I (ISWS), slow wave-stage II (ISWS), rapid eye movement, REM] were studied in cats. Electrophysiological recording of EOG, EEG, EMG and PGO were monitored by polygraph for six consecutive hours. Preparation of saikosaponins was injected intraperitoneally. Results showed that saikosaponins could prolong total sleeping time, ISWS and REM time. The effect of saikosaponins is better than "zhushaanshen pill" by gastric gavage.

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Effects of "Suxiaojiuxin pill" on Isolated Rabbit Aortic Stripes

Zhou Lianfa, Guo Jingsheng, et al

"Suxiaojiuxin pill" at a dose of 2mg/ml obviously inhibited the contraction of isolated rabbit aortic stripes induced by high K^+ , NA, Ach, His and 5-HT. In comparison with phenolamine, the "pill" did not shift the dose-response curve of NA, but depressed maximum response in a none competitive manner. However, similar to verapamil, it shifted high K^+ and Ca^{++} -free high K^+ dose response curve to the right at doses of 0.2~0.4mg/ml. PEG as a solvent did not show any effect in the all tests. These results indicated that "Suxiaojiuxin pill" has a Ca^{++} antagonistic effect in a none competitive manner, mainly by blocking Ca^{++}