

野木瓜注射液对大鼠隐神经传导的影响[△]

上海师范大学生物系(200234) 叶文博* 刘 强 叶 青 卢碧林

摘要 野木瓜注射液(Injection stauntoniae IS)涂布于大鼠隐神经4mm长的一段上。50%IS在6min内使隐神经复合动作电位诸成分的幅度下降,潜伏期延长。尤其是AS和C成分,它们的幅度分别下降为对照的 $47\% \pm 23.0\%$ 和 $44\% \pm 20\%$ ($\bar{x} \pm SD$, $n=8$, $P<0.01$)。10%IS对诸成分的影响大大减弱,但 $A_{\alpha\beta}$ 、 A_{δ} 和C成分的潜伏期依然明显延长,延长值分别为 $0.05 \pm 0.01ms$ 、 $0.28 \pm 0.07ms$ ($n=5$, $P<0.05$)和 $6.99 \pm 1.48ms$ ($n=5$, $P<0.01$)。IS对 A_{δ} 和C成分的影响比对 $A_{\alpha\beta}$ 成分影响大得多,并有量效关系。IS对神经传导的阻滞作用是可逆的。

关键词 野木瓜注射液 神经传导 阻滞作用

野木瓜*Stauntonia chinensis* DC.系木通科野木瓜属植物。具有祛风止痛,舒筋活络功能,用于治疗三叉神经痛,坐骨神经痛,神经性头痛,风湿关节痛和胃肠道绞痛等^[1~3]。近年来,野木瓜针剂用于穴位注射治疗坐骨神经痛、枕大神经痛和颈椎痛等效果良好^[4~6]。本实验将野木瓜注射液直接涂布于大鼠隐神经上,观察它对外周感觉神经传导的影响。

1 材料和方法^[9]

Wistar大鼠(中科院上海分院实验动物中心),雄性,体重250~400g。野木瓜注射液(IS广东和平制药厂,批号920403,每2ml相当于生药5g)。实验用的2种浓度的IS,10%IS和50%IS,用生理盐水稀释所得。手术中,大鼠用乌拉坦(1.8g/kg,腹腔注射)麻醉,并被插入气管插管。热电偶电极插入大鼠直肠,用以测量直肠温度和反馈控制量于大鼠体下的电热毯,以维持大鼠体温在 $36.5 \pm 0.5^{\circ}C$ 。剃去大鼠大腿内侧的毛,切开皮肤,暴露隐神经,在腹股沟处游离隐神经7~8mm,并在游离段的中枢端将隐神经剪断,游离段将作为神经复合动作电位记录端放置在铂金记录电极上。在小腿近踝关节处游离隐神经5mm,下衬塑料薄片,作为刺激端,神经放置于铂金刺激电极之上。在隐神经的中段游离神经4mm,作为涂布药液的部分,并垫以4mm宽的塑料薄片以隔离神经与药物同其下部组织的接触。利用切开的皮肤围成皮斗,用硬塑料片以琼脂为粘合剂将已分离的神经段分隔在3个小室之中,分别给安置记录电极和刺激电极的小室灌注石蜡油,给中间药室的游离神经干上覆盖上含有生理盐水的棉花,以防止神经干燥^[9]。主要实验仪器有JSD-731-C电刺激器,WFZ-87多功能直流放大器(均为中科院生理所研制),IBM PC/XT微机,A/D卡由东南大学研制。数据采集:实验前先分别确定 $A_{\alpha\beta}$ 成分、 A_{δ} 成分和C成分的刺激阈值和最大值,然后以大于最大值的电流作为实验时的刺激电流。微机采样周期分别为A成分,0.06ms;C成分,0.16ms。每次所得数据均为间隔1s重复数次采样后的平均迭加值(A成分迭加5次,C成分迭加8次),并存入微机待实验结束后进行比较分析和测量。数据处理:测出每个数据的幅值和潜伏期,以给药后对给药前幅度的百分比和潜伏期的差作为药物作用的指标,对这些百分比和差进行方差分析。多重比较采用LSD法。药物实验:给药前,药室中的游离神经干复盖浸有生理盐水的小棉球,多次采集到数据的平均值作为药物作用的对照。给药时,去掉生理

*Address: Ye Wenbo, Department of Biology, Shanghai Teachers University, Shanghai

[△]上海市高教局科技发展基金资助项目

盐水棉球，换上浸有一定浓度的IS棉球。然后，按固定的时间间隔采样，记录药物作用过程。洗药时，用温的生理盐水多次冲洗药物作用的神经部位，然后复盖上浸有生理盐水的棉球。定时采样，记录神经传导的恢复过程。

2 结果和讨论

实验数据的统计结果表明：10%和50%的IS均能影响大鼠隐神经复合动作电位 $A_{\alpha\beta}$ 、 A_{δ} 和C成分的传导，这种影响表现为给药期间的复合动作电位幅度下降和/或潜伏期的延长（表1）。幅度的下降是由于部分或全部的神经纤维传导阻滞引起的[9,10]，潜伏期的延长表

表1 IS对大鼠复合动作电位3种成分传导的影响($\bar{x} \pm SD$)

成分	10%IS (n=5)		50%IS (n=8)	
	幅度(%) (给药后15min)	潜伏期延长值(ms)	幅度(%) (给药后6min)	潜伏期延长值(ms)
$A_{\alpha\beta}$	98±3.1	0.05±0.01*	95±6.3*	0.10±0.04 $\Delta\Delta^{**}$
A_{δ}	85±16.8	0.28±0.07*	47±23.0 $^{**\Delta\Delta}$	0.29±0.28*
C	89±14.7	8.99±1.48 **	44±20 $\Delta\Delta^{**}$	5.90±2.13 **

同生理盐水对照相比 * $P<0.05$, ** $P<0.01$ 同10%IS处理组相比 $\Delta P<0.05$, $\Delta\Delta P<0.01$

明复合动作电位通过4mm长的给药区的时间延长了。IS浓度增加，它对复合动作电位的影响也增加，即对神经传导的阻滞作用也加强。这种作用有明显的量效关系。IS对大鼠隐神经中各类神经纤维的影响程度是不同的，它对于 A_{δ} 纤维和C纤维的影响明显强于对 $A_{\alpha\beta}$ 纤维的影响。50%IS6min使 A_{δ} 成分和C成分的幅度明显比 $A_{\alpha\beta}$ 成分下降得多，潜伏期也延得更长。10%IS15min仅使 $A_{\alpha\beta}$ 、 A_{δ} 和C诸成分潜伏期有明显延长，但对幅度没有显著的影响($P>0.05$)。大鼠隐神经中 A_{δ} 纤维和C纤维分别同快痛觉和慢痛觉的传导有关， $A_{\alpha\beta}$ 纤维则同触压觉传导有关[9]，因此IS对痛觉神经纤维传导的阻滞作用明显强于对触压觉神经传导的作用。这同临床采用穴位注射IS治愈各种神经痛的结果是一致的[5~7]。选择性的阻滞痛觉传导可能是IS治愈各种神经痛的机制之一。实验结果还表明不同浓度的IS对大鼠隐神经复合动作电位各成分的影响在洗药后一定时间内均能解除，阻滞作用引起的复合动作电位幅度下降和潜伏期的延长都能恢复（表2）。这表明IS对神经纤维的传导阻滞作用是可逆的。

表2 洗去IS后6min诸成分传导的恢复($\bar{x} \pm SD$)

成分	10%IS (n=5)		50%IS (n=8)	
	幅度(%)	潜伏期延长值(ms)	幅度(%)	潜伏期延长值(ms)
A_{α}	99±4	0.04±0.04	100±4	-0.02±0.09
A_{δ}	99±7	0.13±0.05	101±8	0.08±0.14
C	89±13	2.00±1.53	100±7	1.44±2.63

同生理盐水对照相比 * $P<0.05$, ** $P<0.01$

参 考 文 献

1* 上海第一制药厂. 医药工业, 1975(7): 28

2* 上海第一制药厂,等.中草药通讯, 1976(12): 31

3 上海医药工业研究院. 药品集第九分册. [神经系统药物]. 上海: 上海科技出版社, 1985.98

4 徐恒昭,等.贵阳医学院学报, 1987,12(4): 301

5 陈和吉. 人民军医, 1991(5): 49

6 陆安源,等. 新中医, 1987, 19(2): 30

7 Raranowski R, et al. Br J Pharmac, 1986, 89: 267

8 叶文博,等. 上海师范大学学报(自然科学版), 1993, 22(2): 77

9 Lynn B, et al. Brain Res, 1982, 238: 29

10 顾学裘主编. 药物制剂注解. 北京: 人民卫生出版社, 1983. 413

* 上海第一制药厂的《木通科七叶莲制剂及其临床应用》和《木通科七叶莲治疗三叉神经痛临床观察》中提及的木通科七叶莲 *Stauntonia chinensis* DC.与本文提及的原料野木瓜 *S. chinensis* DC.是同一种植物, 属木通科野木瓜属(见参考文献[10]) (它不同于五加科鹅掌紫属植物七叶莲 *Schefflera arboricola* Hayata).

(1993-12-11收稿)

Rhizome of *Rehmannia glutinosa* Libosch, attention was paid to reveal the chemical changes occurred in the course of processing. In order to find some clues for the process control, changes in the TLC spectrograms were examined and one of the component peak was found changing gradually as the processing went on. Phytochemical separation and identification revealed that the component peak features 5-hydroxy-methyl-furfural (5-HMF). TLCS spectrometric estimation of the 5-HMF contents was developed and used to monitor the process. It was found that the 5-HMF content at the end of processing was 20 times higher than that at the start.

Biological assay indicated that 5-HMF possesses marked antiplatelet activity, which supports the use of Dihuang as a blood activating agent in traditional Chinese medicine.

(Original article on page 13)

The Effects of Injection Stauntoniae on the Conduction of the Saphenous Nerve in Rat

Ye Wenbo, Liu Qiang, Ye Qing, et al

Injection Stauntoniae (IS) was applied on a part of the saphenous nerve of rat 4mm in length. With 50% IS, amplitudes of Aαβ, Aδ and C components of the compound action potential were reduced and their latencies were delayed. In particular, the amplitudes of Aδ and C components reduced to $47.0\% \pm 23.0\%$ and $44.0 \pm 20.0\%$ (MEAN $\pm$ SD, $n=8$, $P<0.01$) of the control's, respectively. With 10% IS, the amplitudes of all components did not reduce significantly, but the latencies of Aαβ, Aδ and C were delayed $0.05 \pm 0.01\text{ms}$ ($P<0.05$), $0.28 \pm 0.07\text{ms}$ ($P<0.05$) and $6.99 \pm 1.48\text{ms}$ ($P<0.01$) ($n=5$) respectively. There was dose-dependency between concentration of IS and its effect on nerve conduction. The effects on Aδ and C components were greater than that on Aαβ component. The effects of blocking conduction of nerve fibers were reversible.

(original article on page 20)

Studies on the Chinese Drug Shasheng V. Comparison of Antitussive and Expectorant Activities

Tu Pengfei, Zhang Hongbin, Xu Guojun, et al

Shasheng is a common Chinese drug used as antitussive and expectorant. A survey showed that the original plants of Shasheng on the current market consist of more than 30 species. To appraise the qualities of Shasheng scientifically, the antitussive and expectorant activities of ten species of Shasheng were compared. Results showed that the EtOH extracts of the roots of *Glehnia littoralis*, *Adenophora stricta* subsp. *henanica*, *A. potaninii* and *A. liliifolioides* are very effective as antitussive, while those of *A. liliifolioides*, *A. stricta* subsp. *sessilifolia* and *A. potaninii* are very effective as expectorant.

(Original article on page 22)

Studies on Antiinflammatory and Immune Effects of Triptophenolide

Yang Jun, Yu Dongfang, et al

Triptophenolide (TN) is a colorless crystalline plate isolated from ethyl acetate extracts of *Tripterygium wilfordii*. It can obviously inhibit the edema caused by xylol and mixture croton oil, and decrease the concentration of Vitamin C in the adrenal gland of mice. TN can remarkably inhibit the delayed type hypersensitivity (DTH) reaction induced by DNCB and BSA, and diminished the peripheral blood ANAE+lymphocytes in rats and mice. More-