

川芎红花注射液对百日咳菌液所致兔脑水肿的作用*

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内容提要 本实验观察川芎红花注射液对百日咳菌液所致兔脑水肿的作用。结果表明：川芎红花注射液对减轻血脑屏障的损害，降低脑血管的通透性，减少血浆成分从血管渗出有一定作用。为临床治疗血管源性脑水肿以及其他原因导致血脑屏障损害的一类疾病，提供了初步的实验依据。

小儿急性脑水肿在儿科临床上发病率与病死率均较高。为了降低本病的病死率，我们利用本院首创的类似儿科临床所见的百日咳菌液所致兔脑水肿动物模型^{*}，观察川芎红花注射液的作用。

材料与方法

选健康红眼白毛中国本兔40只(雄兔16只，未孕雌兔24只)，体重1.5~2.3kg，随机分为治疗组与对照组。两组均按常规程序从右耳静脉注入2.5%伊文思蓝生理盐水1ml/kg，然后从右颈内动脉注入百日咳菌液(由北京生物制品研究所提供，批号84-2)0.8ml/kg。两组于注入菌液后3分钟内按3ml/kg从左耳静脉分别注入川芎红花注射液(由我院特制，每毫升内含川芎1g，红花0.6g，氯化钠9mg，批号841205)及生理盐水溶液(对照组)，若动物存活4小时以上，则于注入菌液后4小时，重复上述剂量一次，观察6小时后同时用戊巴比妥钠静脉注射处死。若在配对兔中，某一只于6小时内先自然死亡，另一只则用戊巴比妥钠同时处死。处死后，立即开颅取脑，用滤纸吸去脑标本表面液体，肉眼观察脑组织充血、肿胀及蓝染的范围与程度，并立即取大脑左右两半球前后对称部位全层大脑组织4块(每块3×5×10mm)，分别用电子天平称取湿重，放入电热干燥箱内烘烤至恒重，按Elliot式⁽²⁾计算脑组织含水量。按Reed方法⁽³⁾测定烤干的脑组织内钠、钾含量。所有雌兔于实验结束后剖腹证实无孕。

结果与分析

脑组织伊文思蓝蓝染的范围与程度：结果见表1、2。表明治疗组脑组织蓝染的范围比对照组小，

表1 大脑皮质蓝染范围 (例)

组别		蓝 染 范 围				μ 值	P 值
		0度	I度	II度	小计		
右侧	治疗	5	11	4	20	1.819	>0.05
	对照	2	9	9	20		
左侧	治疗	17	0	3	20	3.512	<0.01
	对照	11	6	3	20		

注：0度：无蓝染；I度：蓝染占大脑半球表面积1/2以下；II度：蓝染占大脑半球表面积1/2以上

表2 大脑皮质蓝染程度 (例)

组别		蓝 染 程 度				μ 值	P 值
		无	轻度	重度	小计		
右侧	治疗	5	15	0	20	0.309	>0.05
	对照	2	17	1	20		
左侧	治疗	17	3	0	20	2.085	<0.05
	对照	11	8	1	20		

注：轻度：脑组织呈浅蓝色；重度：脑组织呈深蓝色

蓝染的程度也比对照组轻。提示川芎红花注射液对减轻血脑屏障损害的范围与程度，减少血浆成分从血管内渗出是有益的。由于左侧一般脑水肿病变较右侧轻⁽¹⁾，故显示出对左侧的作用较好。

二、大脑组织含水量测定

按Elliot公式计算脑组织含水量(%)=(湿重-干重)/干重×100。两组大脑组织含水量的均值，其治疗组均低于对照组，但差异无显著意义(见表3)。说明川芎红花注射液对减轻脑细胞内水肿的作用似不如对血脑屏障的保护作用强。

三、大脑组织钠、钾含量测定

一般认为脑水肿组织中含钠量增多或同时有钾含量减少。本实验中治疗组除大脑左右部外，其余各部位脑组织中钠含量均略低于对照组(表4)，其差异均

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表3 大脑不同部位平均含水量测定
($\bar{X} \pm SE$, 下同)

合 水 量 (%)				
组别	右前部	右后部	左前部	左后部
治疗	80.12 \pm 0.47	80.68 \pm 0.35	78.87 \pm 0.27	79.64 \pm 0.20
对照	80.86 \pm 0.48	81.28 \pm 0.41	79.42 \pm 0.32	80.37 \pm 0.42
	1.093	1.111	1.301	1.562
P	>0.2	>0.2	>0.2	>0.1

表4 大脑不同部位平均钠含量测定

钠 含 量 (mEq/kg干重)				
	右前部	右后部	左前部	左后部
治疗组	296 \pm 37	286 \pm 26	233 \pm 10	255 \pm 13
对照组	333 \pm 45	322 \pm 29	234 \pm 16	251 \pm 14
	0.629	0.912	0.065	0.188
P	>0.5	>0.2	>0.5	>0.5

表5 大脑不同部位平均钾含量测定

钾 含 量 (mEq/kg干重)				
	右前部	右后部	左前部	左后部
治疗组	457 \pm 28	459 \pm 17	506 \pm 25	524 \pm 21
对照组	424 \pm 27	424 \pm 26	492 \pm 19	516 \pm 22
t	0.909	1.410	0.429	0.251
P	>0.2	>0.1	>0.5	>0.5

无显著意义。大脑各部位的平均钾含量(表5)治疗组均比对照组略高,其差异均无显著意义。说明川芎红花注射液对脑组织中钠、钾含量的影响不大。

讨 论

血管源性脑水肿的主要特点是血脑屏障受损,血

浆成分从血管内渗出到组织间隙。伊文思蓝是一种常用的血脑屏障受损指示剂,它与血清白蛋白结合,能显示出白蛋白透过血脑屏障的范围⁽⁴⁾。当静脉注射伊文思蓝后,通过肉眼观察脑组织蓝染的情况,可以了解血脑屏障受损的部位与程度。

本实验试用川芎红花注射液治疗百日咳菌液导致的兔脑水肿模型。从脑组织伊文思蓝蓝染的范围与程度来分析,提示具有活血化瘀作用的川芎红花注射液对减轻血脑屏障的损害,降低脑血管的通透性,减少血浆成分从血管渗出可能会有裨益。目前公认的地塞米松的抗脑水肿作用机理之一亦是减少血脑屏障对水肿液的外渗⁽⁵⁾。临床病理常将脑水肿分为血管源性与细胞毒性两大类⁽⁶⁾,本实验为临床治疗血管源性脑水肿以及其他原因导致血脑屏障损害的一类疾病,提供了初步的实验依据。

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全国中西医结合骨伤科讲学会在陕西白水召开

全国中西医结合骨伤科讲学会于1988年5月10~16日在陕西省白水县召开,来自14个省、市、自治区的专家学者和有关部门代表70余人参加了会议。

大会以骨伤科的一些重要课题为重点进行了专题

讨论和经验交流,并进行了科研论文评审工作。会议期间,代表们还参观了自力更生创办的家庭骨伤科医院——白水县白水明骨科医院。

(蒲绣山)

the fever tracing become left-shifting, the sustained time of fever reduced, the maximal peak of fever lowered, the temperature response index decreased. In comparing the values with that of CG, the differences of all the above-mentioned parameters were significant ($P < 0.01$). It suggested moxibustion had antipyretic effect on the fever of rabbits caused by colitoxin obviously. But the effect of moxibustion on temperature of normal rabbits was not remarkable. The microcirculation of conjunctiva of febrile rabbits was observed with microcirculatory microscope. The results showed that the speed of blood flow was fast, the numbers of open capillary network increased, the color of blood brightened, the perimicrovascular effusion decreased. It indicated that moxibustion was able to improve microcirculation of colitoxin induced febrile rabbits and eliminate the inflammation, the temperature was lowered. After moxibustion, the rabbits' auricle became obviously congested, temperature of crus helices was higher than the control, the cross points increased markedly, the blood flow accelerated as well. All of these showed the relationship between the antipyretic effect of moxibustion and heat-dissipation. The experiment provided evidence for "heat syndrome could be treated with moxibustion".

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Effects of *Ligusticum-Carthus* Injection on Experimental Cerebral Edema

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Clinically, the mortality and morbidity rates of the children with acute brain edema are relatively high. For the purpose of reducing the rate of mortality of this disease, the effects of *Ligusticum-Carthus* injection with the model of rabbits' cerebral edema induced by pertussis bacillus suspension which is similar to the cerebral edema of children induced by infections and this method was originated in our research department. The experimental results showed that *Ligusticum* and *Carthus* injection can reduce the injury of blood brain barrier (BBB) and the permeability of cerebral vessels, but it appears that effect of reducing intracellular edema is less than that of the former (BBB). In this article, it affords a primary experimental bases for the treatments of vasogenic brain edema and the diseases with injury of BBB induced by other causes.

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Experimental Study on Effect of Sodium Ferulate in Protecting Acute Oxygen Intoxication and Lipid Peroxidation

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9 albino rabbits were divided into 3 groups to observe the effect of sodium ferulate (SF) in the treatment and prevention of acute oxygen intoxication and lipid peroxidation. Group (1) 3 rabbits inhaled normal air serving as control; Group(2) 3 rabbits inhaled pure oxygen continuously; Group (3) 3 rabbits inhaled pure oxygen and received sodium ferulate 50 mg/kg every day at the same time. After 72 hours of experimentation, 2 of the 3 rabbits of group (2) died of acute oxygen intoxication and their plasma malondialdehyde (MDA) showed remarkable increase than the control ($P < 0.05$). While in group (3), no death happened and plasma MDA showed significant decrease than the control ($P < 0.01$). There was no change in the control group. The results revealed that SF exhibited remarkable protection to acute oxygen intoxication of the rabbits by decreasing the lipid peroxidation.

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