

阿魏酸钠抗兔急性氧中毒脂质过氧化*

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内容提要 本实验通过对血浆MDA和全血SOD的检测,观察阿魏酸钠对兔急性氧中毒的抗脂质过氧化作用。实验结果:3只兔常压吸纯氧72小时,2只死亡;3只兔吸纯氧加注射阿魏酸钠无一死亡。吸纯氧72小时后血浆MDA明显增加($P < 0.05$);加用阿魏酸钠组血浆MDA较吸纯氧前明显减少($P < 0.01$)。故中药阿魏酸钠对实验性急性氧中毒兔有明显保护作用。

急性氧中毒主要是由高氧产生的大量超氧化物自由基和自由基诱发的脂质过氧化所造成的损害^(1,2),某些中药或合成药有清除自由基抗脂质过氧化能力。阿魏酸钠为中药川芎和当归的提取物,本实验探讨在常压下纯氧急性氧中毒对脂质过氧化反应过程的规律以及阿魏酸钠抗脂质过氧化的作用。

材料与方法

一、动物:纯种雄性健康大耳白兔9只,体重2 kg左右。

二、阿魏酸钠:由中国医学科学院药物所药理室提供。注射前将阿魏酸钠粉剂50mg溶于1.0ml生理盐水备用。

三、氧舱由海军总医院高压氧科提供。舱内压力为1 ATA, O_2 浓度保持在96~98%, CO_2 浓度不超过2.5%。有专人监测,每日开舱1次,约1小时,清扫卫生,动物取血,投药,添充食料及饮水。

四、全血超氧化物歧化酶(SOD)测定:采用化学光法⁽³⁾,由军事医学科学院放射研究所负责测定。

五、血浆丙二醛(MDA)测定:采用TBA荧光分光光度法⁽⁴⁾。

六、实验方法:9只兔分3组进行观察比较。空白对照组3只吸普通空气,不投药。纯氧组、阿魏酸钠组各3只皆在氧舱内持续吸氧,自进舱前1日起,前者每只每日皮下注射生理盐水1 ml,后者每只每日皮下注射阿魏酸钠50mg/kg。每日称体重、观察饮食及活动情况,并取血查MDA及SOD。进舱后连续观察5天。

结 果

一、吸纯氧组在实验的第3天,即吸氧72小时以后,2只兔在舱内突然死亡,为急性氧中毒。其它两组皆无死亡。

二、吸纯氧前后各组兔血浆MDA变化:实验前和实验后3天血浆MDA(nmol/ml)空白对照组分别为 1.201 ± 0.176 ($M \pm SD$,下同)和 1.299 ± 0.277 ;纯氧组分别为 1.246 ± 0.228 和 1.574 ± 0.369 ;阿魏酸钠组分别为 1.675 ± 0.312 和 1.286 ± 0.175 。由于第3天后,纯氧组死亡2只,故以实验3天以内的数据作方差分析比较。空白对照组血浆MDA在观察期间无显著性变化($F = 0.425$, $P > 0.05$);吸纯氧组吸氧后血浆MDA较吸前有显著性增高($F = 9.516$, $P < 0.05$);阿魏酸钠组血浆MDA在治疗后较治疗前明显下降($F = 18.495$, $P < 0.01$)。

三、吸纯氧前后各组兔全血SOD变化:实验前和实验后全血SOD(ng/g Hgb)空白对照组分别为 338.84 ± 50.77 和 450.90 ± 110.63 ;纯氧组分别为 330.31 ± 51.81 和 483.74 ± 210.08 ;阿魏酸钠组分别为 257.87 ± 117.69 和 388.50 ± 121.29 。统计结果显示:空白对照组($F = 1.132$, $P > 0.05$)、纯氧组($F = 2.070$, $P > 0.05$)、阿魏酸钠组($F = 0.553$, $P > 0.05$)的全血SOD活性在观察期间皆无显著性变化。

讨 论

自从Fridorich于1969年发现SOD以来,人们已对氧毒性的机理作了详细研究,发现高氧产生的大量自由基是急性氧中毒的病理生理基础。超氧自由基具有高的生物活性,可引发脂质过氧化,造成多种生物膜

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如细胞膜、线粒体膜和溶酶体膜破坏,使细胞溶解。MDA为脂质过氧化主要终末产物之一,超氧阴离子自由基可诱导体内SOD生成,血液SOD与MDA水平有助于判断超氧阴离子自由基和脂质过氧化的动态变化。

由于现代重症抢救中,人工呼吸机吸入高浓度氧已是必不可少的措施之一,而预防氧中毒的有效药物尚极少。从本实验结果发现阿魏酸钠可降低血浆MDA含量,表明阿魏酸钠有抗脂质过氧化作用,且能增强兔对急性氧中毒的耐受性。

在本实验中各组兔均未发现SOD活性改变,可能由于(1)纯氧破坏细胞合成SOD的能力;(2)本实验应用化学发光法测出的为有活性的SOD,并非总SOD,无活性的SOD未测出可能影响结果。

需氧生物对氧毒的敏感性受种系、年龄、生理病理状态多种因素的影响,关于阿魏酸钠对人体脂质过氧化病理过程的防治效果评价尚有待深入探讨。

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去敏煎的抗过敏作用

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过敏性疾病是临床常见病,多发病,我们用去敏煎治疗取得了较好的疗效。本实验通过小白鼠被动皮肤过敏实验,观察去敏煎的抗过敏作用。

材料和方法 1.去敏煎制备:麻黄、桂枝、白芍、甘草、当归、川芎各5g。上药洗净,置烧瓶内,煎煮两次,合并两次滤液,在80℃恒温水浴中浓缩至200ml,置于4℃冰箱内保存备用。

2.抗体血清的制备:健康昆明杂系小鼠15只,以1%的鸡蛋清加1%的氢氧化铝凝胶为抗原,每鼠腹腔一次注射,剂量为0.2ml(含鸡蛋清1mg,氢氧化铝凝胶1mg),第12天断头取血,1800转/分离心取血清,4℃冰箱保存备用。

3.实验方法:用健康昆明杂系小鼠60只,体重在20g左右,随机分为给药组和对照组,三批共6组,每组各10只。给药组用去敏煎灌胃,每日2次,每次0.5ml,含生药0.075g。在注射抗体的当天即开始给药,连续用药2天,共灌胃4次,每只小鼠给药总量为0.3g。对照组给予相同体积的生理盐水灌胃。实验时用抗体血清在小鼠腹壁皮内注射0.03ml。在抗体注射后48小时,进行抗原攻击,尾静脉注射1%的鸡蛋

清0.1ml和1%的伊文思蓝0.1ml,20分钟后处死,翻转腹壁皮肤,测定蓝斑直径,并按下列公式计算抑制百分率:

$$\text{抑制百分率} = 100 - \frac{\text{给药组蓝斑平均直径}}{\text{对照组蓝斑平均直径}} \times 100\%$$

结 果 按上述实验方法进行3批实验,结果如附表。抑制百分率分别为49.21%、55.23%和47.7%。

附表 三批实验两组蓝斑直径比较 (M±SD)

组 别	蓝 斑 直 径 (mm)		
	第1批	第2批	第3批
对照	3.15±1.43	3.35±0.66	3.25±0.88
给药	1.60±0.44	1.50±0.74	1.70±0.67
P 值	<0.01	<0.001	<0.001

讨 论 过敏性疾病多与风邪入于血分以至风血相搏有关。根据“治风先治血”的原则,采用辛温解表和活血散风药组成去敏煎,通过以上小白鼠被动皮肤过敏实验,证实该方有明显的抗过敏作用,为其治疗常见的过敏性疾病提供了依据。

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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