山莨菪碱对内毒素休克犬血清 β-葡萄糖醛酸苷酶活力的影响

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内容提要　血清β－葡萄糖醛酸苷酶活力的高低，可反映组织细胞受损的程度。本组实验动物注射内毒素造成休克后，血清β－葡萄糖醛酸苷酶活力升高明显，且随着休克时间延长，活力增高愈为明显。654－2(山莨菪碱)治疗组动物β－葡萄糖醛酸苷酶活力增高幅度较小．此结果提示 654－2 具有明显的抗休克作用。

休克时机体的细胞产生一系列代谢变化，其中包括溶酶体膜通透性增加甚至破裂以及溶酶体酶的释放[1]。不少观察发现休克时血清溶酶体酶增加，特别提到β－葡萄糖醛酸苷酶、组织蛋白酶和酸性磷酸酶，并认为其活力的高低，可反映组织细胞受损的程度[2]。莨菪类药物应用于抢救感染性休克为我国首创，20多年来积累了大量临床资料，证实它有较好的疗效，但作用机理迄今尚未完全阐明。本文从代谢角度观察 654-2 （一种人工合成的山莨菪碱）对内毒素休克犬血清 β-葡萄糖醛酸苷酶活力的影响，将有助于对该药治疗作用及其作用机理的了解。

材料和方法

选用体重为 15.1±1 kg(M±SE) 犬 12 只，均用苯巴比妥按 30mg/kg 静脉注射麻醉。内毒素休克犬模型采用大肠杆菌 $O_{111}B_4$ 内毒素(上海生物制品研究所产品）按 5 mg/kg 计算，一次静脉注射，一小时左右血压下降达到休克标准。其中 6 只犬(雄 5 只，雌 1 只）为654－2 治疗组，即在血压下降后注射654－2 （上海第一制药厂产品)，剂量按 5 mg/kg 计算，溶于 38ml 生理盐水中；另 6 只犬(雄 5 只、雌 1 只）为内毒素休克组，即在血压下降后仅注射等量的生理盐水作为对照。二组犬均在休克前、血压下降时与血压下降后 1 、 2 、 3 小时，抽取静脉血测 β－葡萄糖醛酸苷酶活力．测定方法按Goldbarg[3]介绍，底物为 6 溴-2 萘酚-β-D 葡萄糖醛酸苷 (Sigma)，标准曲线制订采用的标准物为 6 -溴- 2 萘酚(Sigma)。

结　果

内毒素休克组和 654－2 治疗组血清 β－葡萄糖醛酸苷酶的测定结果见附表。附表的设计按 Massion 等介绍[4]．即休克前的测定值为自身对照组并以 100%表示，以后各组的测定值均和自身对照组比较，以酶活力改变的百分率表示，并进行 t 试验统计处理。

附表　内毒素休克组和 654-2 治疗组犬血清 β-葡萄糖醛酸苷酶测定结果

分　组	休克前 (%)	血压下降时 (%)	血压下降后 1 h (%)	血压下降后 2 h (%)	血压下降后 3 h (%)
内毒素休克组	100 (n=6)	133.72±16.29 (n=6, t=2.06) P>0.05	152.60±19.38 (n=5, t=2.71) P<0.05	156.46±12.87 (n=5, t=4.39) P<0.01	167.00±15.46 (n=6, t=4.33) P<0.01
654-2 治疗组	100 (n=6)	118.96±16.53 (n=6, t=1.15) P>0.05	123.48±10.97 (n=5, t=2.14) P>0.05	141.76±18.71 (n=5, t=2.23) P>0.05	148.34±19.26 (n=5, t=2.51) P<0.05

讨　论

β-葡萄糖醛酸苷酶是一种溶酶体酶，广泛存在于机体各处，当组织细胞因缺血、缺氧或中毒等原因受到损伤时，体液中此酶活力增高。不少疾病包括急性病毒性或中毒性肝炎、糖尿病、乳腺癌等[5]血中β-葡萄糖醛酸苷酶活力增高，故此酶的检测对疾病诊断并无特异性。近年来由于发现此酶和酸性磷酸酶、组织蛋白酶三者最能反映组织细胞的损伤情况，尤对判断各类休克的程度及预后估计等方面有所帮助，故日益受到重视。目前此三种酶中较多应用的是β-葡萄糖醛酸苷酶和酸性磷酸酶，并发现β-葡萄糖醛酸苷酶反映细胞损伤程度较酸性磷酸酶更为敏感。

从本组实验可见犬内毒素休克时，血清β-葡萄糖醛酸苷酶活力增高，且随休克时间延长，酶活力增高愈为明显，表现为动物血压下降后1、2、3小时，血清β-葡萄糖醛酸苷酶活力增高，其值与未注射内毒素时的测定结果比较，经统计处理均有显著差别。654－2治疗组动物虽亦见此酶的活力增高，但远无内毒素休克组明显，表现在血压下降后1、2小时所测得的β-葡萄糖醛酸苷酶值与未注射内毒素时的测定结果比较，经统计处理均无显著差别，仅在血压下降后3小时所测得的该酶值与未注射内毒素时的测定结果比较，有显著差别($t=2.51, P<0.05$)，考虑此与休克持续时间长有关。

上述结果足以说明654-2具有明显的抗休克作用，至于抗休克的机理，已证实与654-2能解除血管痉挛、改善微循环有关，如最近体外试验证实[6]654-2能抑制血栓素A_2(TXA_2)合成，TXA_2有强烈缩血管及引起血小板聚集的作用，故654－2抑制TXA_2合成后可达到改善微循环的目的，从而使各脏器的功能恢复，组织细胞溶酶体酶的释放减少。但有作者[7]认为654－2的抗休克作用可能不仅在于扩张血管，须考虑其他作用环节，如654－2对溶酶体膜本身具有保护作用等。此外，近年来已经证实内毒素可使溶酶体释放因子（Lysosomal releasing factor. LRF）上升[8]，LRF具有刺激人多核白细胞释放溶酶体酶的作用，654-2使血清溶酶体酶活力下降是否作用于LRF环节，有待进一步研究加以阐明。

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热退。治疗2个月，达到临床治愈，出院随访二年余，无复发，并已参加工作。

讨　论　本文采用自家血穴注疗法配合其它药物治疗PNH取得了短期（1～2月）治疗即达到临床缓解的满意效果，随访说明本疗法的中远期疗效也属满意。为中西医结合治疗PNH提供新的疗法。其作用机理尚有待进一步探讨。

before and 6 hours after endotoxin administration respectively. In normal saline group and AC group, serum β-glucuronidase activity was found to be 31 and 29 units, cathepsin D activity 4.5 and 4.2 units respectively before endotoxin injection, the difference being of no statistical significance ($P > 0.5$). But 6 hours after endotoxin injection, β-glucuronidase and cathepsin D activity were elevated to 62.5 units and 7.1 units in normal saline group and 31.6 units and 4.8 units in AC group respectively, the difference between the two groups is significant. The effect of *Angelica sinensis* or *Carthamus tinctorius* on lysosome enzymes was similar to but weaker than that of AC. These data suggest that the elevation of lysosomal enzymes during endotoxemia could be inhibited by AC and this inhibition could be caused by the synergy of *Angelica sinensis* and *Carthamus tinctorius*.

(Original article on page 558)

Effect of Anisodamine on Serum β-Glucuronidase Activity in Shock

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The effect of anisodamine on serum β-glucuronidase activity in shock is reported. It was well established that serum level of β-glucuronidase increased under various states of shock and the changes of this enzyme in serum could reflect the degree of cellular damage.

Experiments were carried out on mongrel dogs in shock produced by injected endotoxin. Obvious rise in serum level of β-glucuronidase was observed. The longer the shock lasted, the higher did β-glucuronidase activity become. Our results showed that the level of serum β-glucuronidase activity was lower in the group treated with anisodamine than in the shock group.

The results obtained in the present study indicate that anisodamine can improve cellular damage by way of relieving vasoconstriction and improving microcirculation. Other mechanisms remain to be elucidated.

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The Effect of Qinghaosu (青蒿素) on PFC and RFC of mice Infected with Plasmodium Berghei

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Arteannuin, a new antimalaria, was separated from Herba *Artemisiae* Qinghao, a traditional Chinese drug. Arteannuin kills parasites by interfering with their metabolic processes, and may contribute to increasing immunity of the host. Phagocytosis of macrophages was examined and the phagocytic capacity was found to have increased noticeably, the RFC and PFC of infected mice and normal mice were examined too. When the mice were infected with P. berghei, the PFC and RFC decreased. Arteannuin was used to cure the infected for 7 days, the PFC and RFC were studied daily after discontinuation of the drug, the PFC and RFC increased continuously, but slowly. On the 21st day, the PFC and RFC increased to 28% and 32%, the level of normal mice. The results were similar to those obtained with Chloroquine. The macrophages taken from peritoneal exudate of the normal mice. were injected into the infected mice, and the PFC and RFC were examined; the results showed no difference.

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An Experimental Observation on Preventive and Curative Effect of *Viscum Coloratum* on Acute Myocardial Infarction by Improving the Myocardial Oxygen Consumption

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The beneficial effect of *Viscum coloratum* on ischemic myocardium of 28 rabbits is reported in this paper. After being treated with *Viscum coloratum*, the infarcted area showed no change of myocardial oxygen consumption ($P > 0.05$) statistically as compared with the uninfarcted area. If not treated with *Viscum coloratum*, there would be a significant increase of myocardial oxygen consumption in infarcted myocardial area as compared with the uninfarcted myocardium ($P < 0.05$).

While comparison is made among different groups, significant difference ($P < 0.05$) was also observed. The mechanism of these results, according to the author, might lie in the fact that *Viscum coloratum* could improve coronary collateral circulation, and thus increase the blood oxygen supply. On the other hand, it was verified that *Viscum coloratum* could decrease the cAMP level in ischemia myocardium significantly ($P < 0.05$). So *Viscum coloratum* would directly counteract the excitement of β-receptor causing a remission of oxygen consumption enhanced by sympathetic reflex during the ischemic myocardium.

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