

大蒜素对实验性高胆固醇血症家兔血和主动脉 cAMP 的影响

山东省医学科学院基础所(济南 250001)

高春义 徐英杰 陆 通 张胜乐 李 笠 侯 莉

内容提要 用普通料加胆固醇 (0.5g/kg·d) 喂饲新西兰兔 15 周, 塑造高胆固醇血症模型, 结果表明: 胆固醇组血胆固醇明显升高, 主动脉 cAMP 水平显著降低。加喂大蒜素 (20mg/kg·d) 可防止高胆固醇血症的发生, 并能使主动脉 cAMP 水平维持正常, 为大蒜素防治动脉粥样硬化提供实验依据。

关键词 大蒜素 主动脉壁 环磷酸腺苷 高胆固醇血症

大蒜及其有效成分防治动脉粥样硬化的研究已有报道^[1,2], 但其作用机理尚不清楚。鉴于环磷酸腺苷 (cAMP) 能调节脂质代谢、膜转运及细胞增殖^[3], 而动脉硬化的主要特点是脂质蓄积和细胞增殖, 为此, 本实验观察了大蒜素对高胆固醇血症家兔模型血浆及主动脉壁 cAMP 含量的影响, 为临床用药提供实验依据。

材料和方法

一、材料

1. 动物: 健康新西兰兔 30 只, 由中国医学科学院动物中心提供, 体重 1.5~2.5kg, 雌雄各半。
2. 颗粒饲料: 由烟台福山饲料厂提供。
3. 大蒜素: 胶丸, 由上海第二制药厂生产。
4. 胆固醇: Merck 产品。
5. 液体闪烁计数仪: 美国 Beckman 9800 型。

二、方法

1. 动物实验: 新西兰家兔按同窝配对法随机分 3 组, 每组 10 只: 对照组、胆固醇组和胆固醇加大蒜素组 (简称大蒜素组)。各组以颗粒饲料加少量新鲜蔬菜喂养。胆固醇组每日喂胆固醇 0.5g/kg; 大蒜素组除喂胆固醇外, 每日加喂大蒜素 20mg/kg (用注射器从大蒜素胶丸中抽出, 按 1% 比例与 5% 兔胆汁稀释液乳化后), 灌喂 (其它组用胆汁稀释液作为对照)。每周 6 次。实验第 11 周开始, 分别在胆固醇和大蒜素组加 10% 蛋黄粉和 2% 猪油。定期测定血清胆固醇和血浆 cAMP 含量, 实验 15 周后, 断头处死, 取主动脉至动脉弓的一段血管测定 cAMP 含量。

2. 血和主动脉壁 cAMP 测定: 用放射免疫分析法^[4], 放免药盒由本室制备。

3. 血清胆固醇测定: 硫酸一醋酐法^[5]。

结 果

一、动物一般状况: 实验开始时, 各组动物健康情况正常, 1 个月后, 大蒜素组兔平均体重比胆固醇组稍高 ($P > 0.05$), 持续到实验结束。

二、血胆固醇测定结果见表 1。在整个实验过程中, 对照组血胆固醇水平无明显变化。实验第 7

表 1 大蒜素对兔胆固醇的影响 ($\bar{x} \pm S$)

组 别	胆 固 醇 (mg%)		
	2 周	7 周	14 周
对 照	82.40 ± 2.90	84.70 ± 3.93	99.44 ± 10.71
胆固醇	88.09 ± 3.65	112.60 ± 6.19*	795.50 ± 31.71*
大蒜素	87.54 ± 3.74	80.45 ± 3.39Δ	745.45 ± 49.98Δ

注: 与对照组比 * $P < 0.001$, 与胆固醇组比 Δ $P < 0.001$; 各组动物数均为 10 只

周, 胆固醇组比对照组增加 32.9% ($P < 0.01$), 大蒜素组则下降 5% ($P > 0.05$)。而大蒜素组与胆固醇组比差别极为显著, $P < 0.001$ 。自第 11 周加喂蛋黄粉, 第 14 周胆固醇组和大蒜素组的血胆固醇分别比对照组高 6.9 和 6.5 倍 ($P < 0.001$), 大蒜素组比胆固醇组低 6.3% ($P > 0.05$)。

三、血浆及主动脉壁 cAMP 测定: 结果见表 2。

胆固醇组动物血浆 cAMP 含量在 15 周时较对照组下降 18.8% ($P > 0.05$)。实验 15 周主动脉壁 cAMP 含量胆固醇组较对照组降低 38.7% ($P < 0.05$), 大蒜素组较胆固醇组增加 36.8% ($P < 0.05$), 与对照组比无明显差异。

表2 大蒜素对血浆及主动脉壁cAMP影响
(cpm, $\bar{x} \pm S$)

组别	血浆cAMP		主动脉cAMP	
	1周	7周	15周	15周
对照	80.53 ± 45.39	82.40 ± 22.78	81.52 ± 42.78	291.20 ± 75.57
胆固醇	85.12 ± 21.93	81.60 ± 47.60	66.16 ± 29.61	178.50 $\pm 61.62^*$
大蒜素	71.60 ± 19.30	88.64 ± 36.67	84.56 ± 27.17	282.50 $\pm 79.26\Delta$

注:与对照组比* $P < 0.02$,与胆固醇组比 $\Delta P < 0.05$,各组动物数均为10只

讨 论

大蒜降血脂及防治动脉粥样硬化的疗效已被证实,但对其作用机理了解甚少。张胜乐等⁽⁶⁾发现大蒜素通过调节血小板内cAMP而抑制高脂血症兔的血小板聚集作用。本实验表明,饲高脂饲料15周后,当家兔患高胆固醇血症时,肉眼观察主动脉壁虽无明显病变,其主动脉cAMP水平显著降低。加喂大蒜素(20 mg/kg·d),其主动脉cAMP含量仍维持在正常水平。

初步结果表明,大蒜素防治动脉粥样硬化的作用机制,可能与高胆固醇血症时维持主动脉壁内cAMP正常水平有关。

主动脉壁cAMP含量变化较明显,但各组血浆cAMP含量无差异,说明血浆水平不能完全反应局部组织中的变化。第14周时,大蒜素组血清胆固醇比胆固醇组低,但无显著性差异,可能与11周时加喂蛋黄粉及猪油量过多,大蒜素剂量相对不足有关。

参 考 文 献

1. 赵法俊,等.合成大蒜素防治动脉粥样硬化症的研究.营养学报 1982; 2:109.
2. 张吟秋,等.大蒜精油预防动脉粥样硬化的实验研究.中成药研究 1984; 6:23.
3. Jost JP, et al. Cyclic AMP. Ann Biochem 1971; 40: 741.
4. 徐英杰,等.环磷酸腺苷(cAMP)放射免疫分析法的建立.中国医科院年报 1980:35.
5. 陶义训,等.临床生化检验.第1版.上海:科学技术出版社,1984:182.
6. 张胜乐,等.大蒜素在实验性高胆固醇血症中抗血小板聚集作用的研究.中西医结合杂志 1986; 6(11):677.

中西医结合治疗手指末节开放性骨折 33 例

江西省成新农场医院(新建县 330125) 陶涛芳

1984年以来,我们采用局部外敷法治疗手指末节远端开放性骨折并缺损33例39指,疗效满意。

一般资料 本组33例中男31例,女2例,年龄6~54岁;压轧伤18例,锯伤11例,绞窄伤4例,其中油漆污染者21例。伤后4小时内就诊者29例,4~8小时就诊者4例。

治疗方法 将中药黄柏15g 当归30g 丹皮15g 丹参20g 红花15g 泽泻15g 冰片5g共研细末,分两等份。1份为粉剂,另1份加入75%酒精500ml,制成酊剂,分别装瓶备用。用药前先用3%双氧水,生理盐水清洗创面。创面中的异物尽量取出,碎骨和软组织尽可能复位,即使创缘皮瓣游离或骨折残端露出创面少许亦不修剪。然后将上述药末加75%酒精调成糊状外敷,直至掌指关节,厚度0.3cm左右。外用塑料薄膜包扎,薄膜前端超出创面4cm左右,向上反折过去复盖创面,每日4次揭开前端薄膜,用上述酊剂和654-2注射液交替滴入,以保持药粉湿润,3天换药1次。天气冷,注意保暖以利创口愈合。每例除肌注破伤风抗毒素1500u以外,不再全身用药。

结 果 本组39指中,经治4~7周,平均5周

治愈。手指外观正常,感觉恢复或部分恢复者为优,计32指;手指缩短畸形愈合,但较断面伸长1cm以上者为良,计7指。

体 会 此方能有效地预防感染。方中黄柏、丹参、丹皮、泽泻、酒精等均具有不同程度的抗菌杀菌作用,配伍使用效果更好。外敷此药后,最初3天内,创面有较多的脓性分泌物,有的整个手指伴有红肿现象,继续观察3~6天红肿自然消退,并无1例发生感染。方中丹参、红花能提高组织对缺氧的耐受能力,而且丹参、丹皮、当归含挥发油,加入冰片、酒精、654-2能扩张血管,改善局部血液循环,故有活血通经作用。丹参还有抑制纤维母细胞过度增生作用,这对防止疤痕过早形成,促进上皮再生是十分有利的。本组病例中,我们只对创面冲洗而不修剪软组织(骨残端如呈骨刺状应修平),结果大部分“半死不活”的软组织恢复了生机,成了残指增长的基础,部分坏死组织随外敷药一同弃去。从增长情况看,以手指背部而言,只要指甲根存在则可增长到正常;以指腹而言,缺损超过末节1/2的,则指腹缩小而愈合,缺损少于1/2的,多能恢复正常。

production of plague forming cells (PFC), the DTH response induced by allogeneic splenocytes. The mixed lymphocyte reaction was much stronger in the drug-receiving group than that in the control group. Further study indicated that KSSF was able to enhance the activities of cytotoxic T lymphocyte and the production of interleukin 2.

Key Words Kang Shuai Sen Fang, cytotoxic T lymphocyte, interleukin 2

(Original article on page 223)

Effect of *Polyporus umbellatus* Polysaccharide on Function of Macrophages in the Peritoneal Cavities of Mice with Liver Lesions

Zhang Ying-hua(张英华), Liu Yu-lan(刘玉兰), Yan Shu-chang(严述常)

Institute of Chinese Materia Medica, China Academy of TCM, Beijing (100070)

The cells in peritoneal cavities of mice were taken out and cultured in vitro. The amount to release H_2O_2 of the macrophages was assayed by fluorimetry. *Polyporus umbellatus* polysaccharide (PUP) could not only increase the number of macrophages and the amount of H_2O_2 release in the peritoneal cavities of normal mice, but also raise the lowered number of macrophages and the ability to release H_2O_2 in the peritoneal cavities of the mice with liver lesions caused by CCl_4 significantly. So PUP could improve the cellular immunity of normal mice and the mice with liver lesions.

Key Words *Polyporus umbellatus* polysaccharide, liver lesions, macrophages of peritoneal cavities

(Original article on page 225)

The Effect of Allitridi on cAMP Level of Artery Wall and Plasma of Hypercholesterolemic Rabbits

Gao Chun-yi(高春义), Xu Ying-jie(徐英杰), et al

Institute of Basic Medicine, Shandong Academy of Medical Science, Jinan (250001)

30 New Zealand rabbits weighing 1.5~2.5 kg were all fed a common diet and subdivided into 3 groups. Group I (the control), group II received cholesterol (0.5 g/kg · d), while group III was added cholesterol (0.5 g/kg · d) and the allitridi (20 mg/kg · d). Blood cholesterol, cAMP and artery cAMP were determined by the usual technique. The results showed that serum cholesterol level was significantly reduced by allitridi during the 15 weeks period of study and the artery wall cAMP level of group I and group III were significantly higher than group II. But there was no significantly difference between group I and III. The difference of cAMP level in plasma was not significant.

Key Words allitridi, artery wall, cyclic adenosine monophosphate, hypercholesterolemia

(Original article on page 227)

Effect of Promoting Biliation Mixture on E. Coli under Electron Microscopy

Qin Ming-fang(秦明放), Li Le-tian(李乐天)*

Dept. of Surgery, First Affiliated Hospital, Tianjin Medical College, Tianjin (300052)

**Dept. of Surgery, Third Affiliated Hospital, Hebei Medical College, Shijiazhuang (050051)*

With electron microscopy this article observed the effect of promoting biliation mixture (PBM) and polymyxin B on E. coli lipopolysaccharide (LPS). The result showed that PBM could breakdown the typical structure of E. coli LPS with only short sections or partially disaggregate it. The morphology changes were similar to the effect of polymyxin B. It would appear that the loss of endotoxicity caused by PBM may be due to the loss of structural integrity of the E. coli LPS. The result may also give some evidence for the clinical effects of PBM theoretically.

Key Words electron microscopy, endotoxin, promoting biliation mixture, polymyxin B

(Original article on page 229)