

健脾益气汤对脾虚大鼠肌糖原含量的影响

北京市脾虚研究协作组 熊海* 张澄波* 危北海** 汤汉芬*

内容提要 为探讨中医脾与肌肉的关系,对正常大鼠和用大黄造成的脾虚模型大鼠的肌糖原进行了测定。正常大鼠肌糖原含量为 6.34 ± 0.20 (mg/g肌肉,下同);而脾虚大鼠的含量仅为 4.27 ± 0.40 ,显著低于正常大鼠。对脾虚大鼠用健脾益气糖浆治疗7天后复测肌糖原,其值为 5.95 ± 0.16 ,给脾虚大鼠喂以蒸馏水自然康复作对照,7天后其肌糖原含量为 4.63 ± 0.15 ,喂药动物的肌糖原含量回升显著快于喂水动物,但仍低于正常动物。

“脾”是中医脾胃学说的核心。脾的功能广泛,如:脾主运化、脾主肌肉、脾主统血等。目前国内许多学者对脾的主运化和主统血功能已做了大量工作⁽¹⁾。但对于脾主肌肉方面的研究迄今未见报道。从现代医学观点看,肌肉属运动系统,肌糖原是其重要能量来源。脾虚患者出现四肢乏力、肌肉消瘦等症状,可能与肌肉的能量代谢失调有关。因此,我们利用大黄致虚的脾虚动物模型,测定了模型动物肌糖原含量的变化。现将方法和结果报道如下。

实验材料

一、动物:Wistar大鼠,雌性,体重150~200g,购自中国医学科学院动物饲养场。

二、中药及制备

1. 200%大黄煎剂:称取普通大黄片(购自北京药材公司)100g,加100ml蒸馏水,煮沸后,文火续煮半小时,趁热以四层纱布过滤,滤液置80℃烤箱内浓缩成50ml即可。

2. 健脾益气糖浆:北京中医医院中心制剂室提供。成分为:黄芪30g 党参15g 茯苓30g 白术15g 陈皮15g 甘草4g。

方 法

一、动物的造型:将实验动物随机分成4组。

1. 正常组:每日以蒸馏水灌胃,每次3ml,每日1次。

2. 造型组:基本按中国中医研究院建立大鼠脾虚模型的方法⁽²⁾,因选取动物体重与原法使用的动物不同,胃饲大黄剂量略作更动。以每日灌胃200%大黄

煎剂2次,每次2ml。连续灌胃12~13天,当动物出现便溏、纳呆、懒动、四肢乏力、消瘦、畏寒、食欲减退、毛发枯槁竖毛等症状,则可认为脾虚模型已建成。

3. 自然恢复组:脾虚动物每日胃饲蒸馏水2ml,连续7天。

4. 治疗组:脾虚动物每日胃饲健脾益气糖浆2ml,连续7天。

二、肌糖原的测定:本实验所用试剂均为国产分析纯药品配制。

准确称取大鼠后腿肌肉3g,将肌肉放入一盛有2ml KOH(300g/L)的10ml刻度离心管中,沸水浴中煮20分钟,煮沸过程中偶加振荡。以冰水冷却离心管。为使糖原沉淀完全,以0.2ml的饱和 Na_2SO_4 和95%(v/v)的乙醇共同沉淀糖原,将沉淀混匀,冰浴中放置8~10分钟。混匀,以3000转/分离心5分钟,弃上清液。再以少量温热蒸馏水溶解沉淀,以蒸馏水稀释至10ml刻度⁽³⁾。

将上述10ml溶液全部倾入锥形瓶中,并以5N HCl 10ml洗离心管1~2次,清洗液倒入锥形瓶中。在沸水浴中煮沸半小时以水解糖原。冷却后,用10%的NaOH调pH至中性(酚酞指示剂由无色至微红)。最后将水解液定量转移至容量瓶中,定容至50ml。

用3,5-二硝基水杨酸法测还原糖量,按文献⁽⁴⁾方法略有改动,最后折算为肌糖原含量。

结果与讨论

4组动物肌糖原含量见附表。

本实验结果表明,脾虚模型动物肌糖原含量比正常动物低,两组比较 $P < 0.001$ 。肌肉运动的能量靠ATP及肌肉内的磷酸肌酸(CP)提供高能键,而ATP

* 首都医学院生物化学教研室

** 北京市中医医院中医研究所

附表 各组大鼠肌糖原含量 (mg/g 肌肉)

组 别	动物数	肌糖原 (M±SE)
正 常	14	6.34±0.20* ** ***
造 型	12	4.27±0.40△ △△
自然恢复	10	4.63±0.15△
治 疗	10	5.35±0.16

*与造型组比 $P<0.001$ **与自然恢复组比 $P<0.001$ ***与治疗组比 $P>0.002$ △与自然恢复组比 $P>0.05$ △△与治疗组比 $P<0.05$ ▲与治疗组比 $P<0.01$

和CP的能量最终来源于有氧氧化和肌糖原酵解^[5]。肌糖原是肌肉内能源重要贮存方式,其减少表明肌肉营养状况不良,能源贮备不足。这大概可以解释脾虚患者与脾虚动物出现的肌肉消瘦、四肢乏力、懒动畏寒等症状。

脾虚动物肌糖原贮量减少很可能与其运化功能失调有关。脾虚动物对营养物的消化吸收出现障碍,不能及时正常地补充消耗掉的肌糖原。所以,从现代医学观点,似可以说明脾主肌肉是从属于脾主运化这一功能的。肌糖原减少是否与糖代谢失调有关,尚待进一步研究。

用健脾药进行治疗的药物反证实验结果显示:喂饲健脾益气糖浆对肌糖原含量恢复有一定作用,治疗组与造型组动物比较差异显著($P<0.05$),而仅喂水的自然恢复组动物肌糖原含量没有显著的回升,与造型组比 $P>0.05$ 。治疗组动物肌糖原显著高于自然恢复组 $P<0.01$,说明健脾益气糖浆确有疗效。但复健的两组动物在较短时期内都没完全康复,两组动物肌糖原含量与正常组比均是 $P<0.001$,差异十分显著。这或许和治疗时间不够长有关。

参 考 文 献

1. 危北海. 对“证”的实质的探讨. 首都医学院学报 1987; 8(1): 51.
2. 杨 云, 等. 大黄引起大鼠虚证模型的实验研究(一)——动物虚证模型的建立. 全国中西医结合虚证研究与防治老年病会议资料汇编, 1982: 105.
3. DT普卢默. 实用生物化学导论. 北京: 科学出版社, 1935: 351.
4. 张龙翔, 等. 生化实验方法和技术. 北京: 人民教育出版社, 1983: 9.
5. 张昌颖. 生物化学. 第二版. 北京: 人民卫生出版社, 1985: 546.

巨刺对88例血栓闭塞性脉管炎患者肢体血流图的影响

解放军 272 医院 李连生

本文报告巨刺前后88例血栓闭塞性脉管炎患者肢体血流图变化。

对象及方法 88例诊断明确的血栓闭塞性脉管炎患者,男68例,女20例,年龄在17~70岁之间,病程1年以内者31例,2~5年者42例,5年以上者15例,取一侧阳陵泉、足三里穴。在针刺得气后施平补平泻手法,留针10分钟。室温控制在16~20℃之间,肢体血流图描记用吉林产JX74-A型血流图仪连接日本光电2120型心电图机,定标0.1Ω。用铜质镀银条形电极,分别描记双侧足拇趾一足背段血流图,取5个波的平均值计算,纸速25mm/s。描记前患者取仰卧位休息15分钟,针刺前描记双侧血流图,针后15分钟再次描记血流图,作自体对照比较,88例患者随机分为巨刺组(针健侧)、非巨刺组(针患侧),每组44例。

结果与体会 巨刺组针刺后15分钟,患侧血流图波幅明显升高,与针前对比 $P<0.01$ 。健侧血流图波幅亦有升高,但与针前对比 $P>0.5$ 。非巨刺组针刺后

15分钟,患侧血流图波幅升高不明显,与针前对比 $P>0.5$ 。健侧血流图波幅明显升高,与针前对比 $P<0.05$,见附表。

附表 巨刺与非巨刺对患者肢体血流图波幅的影响 (M±SE)

		针 前	针 后	P
		(Ω)		
巨 刺 组	患侧	0.047±0.0058	0.062±0.0137	<0.01
	健侧	0.085±0.0163	0.088±0.0190	>0.5
非巨刺组	患侧	0.051±0.0100	0.056±0.0090	>0.5
	健侧	0.067±0.0045	0.083±0.0087	<0.05

本实验结果显示,巨刺组和非巨刺组均能引起双侧肢体血流图波幅的升高,而巨刺组主要引起患侧肢体血流图波幅的升高,非巨刺组升高则无显著差异。对于改善患肢血流的即时效应,巨刺法优于非巨刺法,为巨刺在临床的应用提供了一定依据。

Influence of Yang(阳)-Restoring Herb Medicines upon Metabolism of Thyroid Hormone in Normal Rats and an Approach of Forward-Backward Medication Method

Shanghai Institute of Endocrinology, Shanghai

Chen Mingdao (陈名道), Kuang Ankun (邝安萱), Chen Jialun (陈家伦), et al

Large dose of Yang(阳)-restoring herb medicines (*Radix Codonopsis Pileosulae*, *Astragalus membranaceus*, *Radix Aconiti Prueparata*, *Epimedium brevicornum*, *Cortex Cinnamomi* and *Herba Cistanchis*) may exert an unfavorable effect on normal rats, i. e. natural weight gain reduced ($P < 0.01$), serum T_3 decreased ($P < 0.05$), rT_3 , TRH levels raised ($P < 0.01$) and TSH showed a raising tendency. Lower T_3 and higher rT_3 levels may be the effects of Yang-restoring herb medicines on the peripheral metabolism of thyroid hormones, i. e. more thyroxine was degraded to rT_3 with little biological effect and less was transformed to T_3 with strong hormonal effect. This unfavorable effect, however, can be avoided by Forward-Backward method. It was advised that large dose of Yang-restoring herb medicines could not be given to the organisms without symptoms of Yang-deficiency. If it were tried to do so, Forward-Backward method might be recommended.

(Original article on page 93)

Observation on Muscular Glycogen of "Spleen Deficiency" Rats

Treating with Jian Pi Yi Qi Decoction(健脾益气汤)

*Xiong H. (熊海), Zhang Changbo (张澄波), *Wei Beihai (危北海), et al*

Dept. of Electrobiology, Capital Institute of Medicine, Beijing

**Beijing Institute and Hospital of TCM, Beijing*

Beijing Cooperation Group of Research for "Spleen Deficiency", Beijing

The relationship between "Spleen" and muscles was explored by determining the amount of muscular glycogen to indicate the stored energy in muscles. The amount of muscular glycogen in normal rats was 6.34 ± 0.20 mg/g muscles, it was much more than that in Spleen deficiency rats caused by rhubarb (4.27 ± 0.40 mg/g muscles). In order to observe the effects of Jian Pi Yi Qi decoction on Spleen deficiency, the Spleen deficiency rats were divided into two groups, one of which was treated with Jian Pi Yi Qi decoction as experimental group, the other with distilled water as control. After one week, the amount of muscular glycogen in experimental group was 5.35 ± 0.16 mg/g muscles and in control 4.63 ± 0.16 mg/g muscles. It showed that the rising of the amount of muscular glycogen in experimental group was more than that in control with statistic significance but it was still lower than that in normal rats.

(Original article on page 96)

Histopathological Observation on Therapeutic Effect of

***Tripterygium wilfordii* in the Treatment of Experimental Allergic Encephalomyelitis**

Li Chunguang (李春光), et al

Dept. of Pathology, 251 Hospital, PLA

The *Tripterygium wilfordii* (TW) was used to treat experimental allergic encephalomyelitis (EAE) in guinea-pig. The morphological change was observed by using light microscope. Lymphocytic histochemical staining was performed on the spinal cord from EAE in guinea-pig. The results were: The incidence of inflammatory reaction, neuraxial swelling, break and neuronal necrosis in the treatment group was lower than that in the control group ($P < 0.01 \sim 0.005$); the variation of incidence of neurofibrillar demyelinating in the treatment group was smaller than that in the control group ($P < 0.025$). The result of ANAE and ALP staining for lymphocytes in the spinal cord from EAE was T-cell. It showed TW could inhibit the allergic action and decrease tissular injury.

(Original article on page 98)