

# 实验研究

## 补肾健骨汤对膝关节病患者氧自由基代谢的影响

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**摘要** 对 58 例膝关节病患者用补肾健骨汤治疗前后的红细胞超氧化物歧化酶 (SOD) 及血清脂质过氧化物 (LPO) 含量进行了动态检测。结果: 患者治疗前 SOD 活性低于正常, LPO 含量高于正常 (P 均 < 0.01)。经治疗病情好转者其氧自由基代谢指标相应改善, 显著者恢复正常, 无效者仍异常。提示氧自由基可能参入骨关节病的病理过程; 补肾健骨汤治疗骨关节病的机理与其改善患者体内氧自由基代谢的紊乱状况有关。

**关键词** 补肾健骨汤 骨关节病 超氧化物歧化酶 过氧化脂质 氧自由基

临床实践证明, 补肾健骨汤治疗骨关节病疗效显著<sup>[1]</sup>。实验研究亦发现, 该方可促进骨膜向软骨细胞分化的过程, 使实验性骨关节病局部变性坏死软骨细胞得以一定程度修复<sup>[2-3]</sup>。近年来, 随着自由基生物学的发展, 认识到氧自由基代谢参入退行性骨关节病的病理过程<sup>[4]</sup>, 而超氧化物歧化酶 (SOD) 和过氧化脂质 (LPO) 是反映机体自由基代谢的重要指标<sup>[5]</sup>。为此, 本文动态观察了 58 例膝关节病患者用补肾健骨汤治疗前后的红细胞 SOD 及血清 LPO 含量变化, 以进一步探讨补肾中药治疗骨关节病的机理。

### 材料与方 法

1. 观察对象: 治疗组为本院就诊的膝关节病患者 58 例, 其中男 26 例, 女 32 例; 年龄 44~60 岁, 平均 51.3 岁。诊断标准以裘法祖主编的《外科学》为依据<sup>[6]</sup>。所有患者均有膝关节疼痛 (单侧 31 例, 双侧 27 例); 41 例膝关节活动不灵活或活动时异常响声; 31 例 (46 膝) 关节肿胀, 骨科 B 超检查有渗液。X 光摄像显示: 17 例 (21 膝) 关节间隙变窄, 关节骨端骨质硬化; 22 例 (36 膝) 关节骨端有广泛不规则密度阴影, 有明显囊性变伴骨质增生; 19 例 (28 膝) 关节间隙狭窄, 关节面凸凹不平, 关节边缘骨赘形成。全部病例均经临床筛选, 排除主要脏器病变, 受检查前 2 周无服药史。

对照组 30 例, 其中男、女各 15 例, 年龄 38~65 岁, 平均 48.2 岁, 为本院健康职工。

2. 药物及治疗方法: 补肾健骨汤水煎醇沉液 (附方: 黄芪、丹参各 18g、杜仲、玄胡、鹿角片各 15g、淫羊藿、骨碎补、川牛膝、鸡内金各 10g、鳖甲 6g), 由本院中药制剂室制备, 终浓度为生药 2g/ml。装瓶后高压消毒密封。本组病例均口服补肾健骨液, 每次 20ml, 日 2 次, 连续服用 1 个月。观察期间禁用其它中、西药。

所有患者均于治疗前、后各检测 SOD 活性及 LPO 含量 1 次。19 例患者在治疗后 3 个月进行了第 3 次检测。

### 3. 检测方法:

SOD 活性检验: 取空腹静脉血 5ml, 肝素抗凝, 生理盐水洗涤后, 加双蒸馏水充分溶血, 95% 乙醇—氯仿混合液充分混匀, 在旋转混合器上振荡提取 1 分钟, 离心沉淀血红蛋白, 上清液为 SOD 提取液。SOD 快速检测试剂盒由海军抗衰老研究中心提供 (批号 93-1004)。检测步骤按药盒说明书进行。

LPO 含量测定: 取血清 50ul, 按硫代巴比妥酸荧光法测定<sup>[7]</sup>。主要试剂丙二醛双乙基缩醛 (MDA) 及硫代巴比妥酸 (TBA) 均为上海试剂二厂产品。仪器采用日制 XY-4 型荧光分光光度计。测定条件: 量程 10mv, 激发光波长 515nm, 发射光波长 553nm, 杯光径 1cm。以上测值采用 SAS 软件包进行显著性 T 检验。

### 结 果

1. 疗效: 显效 (自觉疼痛完全缓解, 患部肿胀消除) 25 例 (43.10%); 有效 (自觉疼痛

明显减轻, 肿胀基本消除, 功能活动基本正常) 22 例 (37.93%); 无效 (经治疗 1 月症状、体征略改善或无改善) 11 例 (18.97%)。总有效率为 81.03%。显、有效 47 例中, 有 31 例经 3 个月随访, 8 例复发, 占随访病例的 38.7%。

2. SOD 活性及 LPO 含量测定结果: 58 例患者治疗前 SOD 活性显著低于正常, 而 LPO 含量高于正常 ( $P$  均  $< 0.01$ )。经治疗 1 月后, 显

效者两项测值恢复正常 ( $P$  均  $> 0.05$ ); 有效者 SOD 活性与对照组无明显差异 ( $P > 0.05$ ), 但 LPO 仍高于正常 ( $P < 0.05$ ); 无效者测值仍异常 ( $P$  均  $< 0.01$ )。19 例显, 有效者治疗后 3 个月随访时, 重复检测。复发者 SOD 及 LPO 值又出现异常 ( $P < 0.05$ ,  $P < 0.01$ ), 而未复发者仍维持正常水平 ( $P$  均  $> 0.05$ )。

表: 58 例膝关节骨关节治疗前后 SOD 活性及 LPO 含量变化 ( $\bar{x} \pm s$ )

项 目	治疗组						正常对照组 (n=30)
	治疗前 (n=58)	治疗后 (n=58)			随访 (n=19)		
		显效 (n=25)	有效 (n=22)	无效 (n=11)	复发 (n=7)	未复发 (n=12)	
SPD 活性 (u/gHb)	1502.84** 71.59**	1781.62* $\pm 387.27$	1752.44 $\pm 416.57$	1571.59** $\pm 403.31$	1604.37* $\pm 311.29$	1826.54 $\pm 367.47$	1912.42 $\pm 318.63$
LPO 含量 (mmol/L)	3.188** $\pm 0.541$	2.631 $\pm 0.464$	2.847* $\pm 0.636$	3.143** $\pm 0.724$	2.976** $\pm 0.818$	2.532 $\pm 0.387$	2.481 $\pm 0.236$

(注) 与对照组相比,  $P$  值: \*  $P < 0.05$ , \*\*  $P < 0.01$

## 讨 论

骨关节病是以关节软骨退行性变伴软骨下骨质增生为特征的疾病。研究表明, 氧自由基代谢可能参与该病的病理过程<sup>[4]</sup>。所谓氧自由基包括超氧阴离子 ( $O_2^-$ ), 单线态氧 ( $^1O_2$ ), 羟自由基 (OH), 其均是引发脂质过氧化自由基连锁反应的氧化剂, 在反应过程中产生 LPO, 同时导致组织细胞的损伤<sup>[5]</sup>。由于正常生理细胞中富含 SOD, 能特异性灭活并清除超氧自由基, 使机体的自由基代谢保持相对平衡。

本实验结果表明, 骨关节病患者红细胞 SOD 活性明显下降, 血清 LPO 含量增加, 且两者随病情变化而消长, 呈负相关, 与文献报告基本一致<sup>[4]</sup>。提示患者机体 SOD 清除超氧自由基功能下降, 脂质过氧化作用增强, 有害氧化增加。现已知, 脂质过氧化作用可导致关节软骨表面的胶原蛋白发生交联, 形成大分子物质而变得僵硬<sup>[5]</sup>。体外实验亦表明, 软骨细胞在氧自由基作用下, 合成和分泌蛋白多糖的功能发生改变, 蛋白多糖出现流失<sup>[4]</sup>。胶原蛋白和蛋白多糖是软骨基质中的主要成分, 其在维持软骨强度和弹性方面起着重要作用。因此自由基对

这两种物质的损害引起和加剧关节软骨细胞的退变和坏死, 在骨关节病发病机理和病理过程中的意义是不可忽视的。

本组 58 例经补肾健骨汤治疗 1 月后, 47 例随病情好转, SOD 活性上升, LPO 含量下降; 25 例显效者测值均恢复正常水平。由此提示, 补肾健骨汤治疗骨关节病的疗效机理可能与其能改善患者体内自由基代谢的紊乱状况有关。查阅文献<sup>[6]</sup>, 补肾健骨汤组方药物中, 黄芪可升高衰老大鼠下降的 SOD 水平, 降低血浆中 LPO 含量; 淫羊藿能明显提高 D-半乳糖所致的衰老小鼠模型肝脏总 SOD 活性, 减少肝脏 LPO 形成, 保护其免遭自由基损害; 杜仲能抑制四氯化碳引起的血清和肝脏脂质过氧化反应; 鹿角霜能明显增加老年小鼠血、肝和脑组织中 SOD 含量, 加速体内超氧自由基的清除, 发挥抗衰老抗损伤作用。

值得指出的是本组显、有效 47 例中, 有 31 例经 3 个月随访, 8 例复发 (占 38.7%), 其中 7 例重复检测, 发现其 SOD 和 LPO 又呈异常状况。提示我们用本方治疗获效后, 应适当进行巩固性用药, 可能有利于降低复发率。

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# 中药离子透入对髌部骨密度影响的实验研究

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股骨头缺血性坏死是骨科常见的疾病之一, 中药局部透入治疗有显著疗效, 国内文献报导疗效高达到 93.3%, 我所观察疗效也达到 86.4%, 治疗及用药方法基本相同, 均根据中医理论, 祛风湿, 舒筋活络, 散热止痛的原理, 达到治疗目的。

为了进一步探讨该中药方对于股骨头缺血性坏死的治疗机理, 我们利用激素诱发股骨头坏死的家兔模型进行了实验研究:

## 材料和方法

健康大耳白家兔 20 只, 两性兼有, 体重在 2500 克左右, 随机分为 5 组, 即正常组: 未做任何处理的正常家兔; 造模组: 用醋酸氢化考地松 (25mg/kg 腹腔注射) 每周 1 次共 5 周, 造成的股骨头坏死的家兔; 理疗组: 在造模家兔左侧髌区做中药离子导入治疗; 擦药组: 先造模, 然后左髌区擦中药液; 口服中药对照组: 造模后, 每日灌喂药马氏骨丸的混悬液, 剂量为成人每公斤体重剂量的 50 倍。

理疗组是采用 ZGL-1 型上海产直流感应电疗机。中药为: 木瓜 30g, 甘草 20g, 牛膝 15g, 威灵仙 30g, 龙脑 5g, 方法是将中药 (龙脑除外) 放入容器中, 加水到 800ml, 煮沸 40 分钟, 澄出药液 200ml, 然后煮第二煎澄出 200ml, 将两次的药液加在一起浓缩至 200ml, 再将研磨的龙脑放入药液中搅拌均匀即可。治疗时用中

药液 10ml 浸泡药垫, 根据药液的离子性阴极导入, 将阴阳极铅板连结的药垫置于家兔髌部上下对置起来, 用砂带固定, 每日一次, 每次 20 分钟, 30 次为一大疗程。观察的指标为动物髌区骨密度的变化, 用美国制造的 Lunar-DPX 双光能 X 线骨密度仪测定, 用仪器配置的小动物局部测定软件进行测量, 扫描范围从下腰部开始包括骨盆, 髌部, 直抵尾根部, 用自动分析程序分别提出, 左右髌区的骨密度测定值, 提取方框为 15×15mm<sup>2</sup>, 提取区包括髌臼大部, 全部股骨头, 部分股骨颈及大小粗隆, 用计算机对骨密度测定之数值做统计学分析。

## 结 果

1. 各组动物髌区骨密度的平均值和标准设列于下表:

表: 家兔髌区骨密度的平均值

NO	组别	平均值 (单位 f/cm)	SD
1	正常家兔	0.3728	0.0453
2	造模组	0.3206	0.0336
3	中药离子透入组	0.4975	0.1403
4	擦药组	0.3515	0.0509
5	口服中药对照组	0.3704	0.0350

2. T-检验结果:

正常组与对照组相比 P<0.001, 表明造模后, 动物髌区的骨密度明显低于正常家兔。对

## English Abstract

**Clinical study of non-operative treatment of lumbar disc herniation** Jin Liaosha et al  
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In this article, the method of treating the lumbar disc herniation by manipulation under general anesthesia in 469 cases were introduced. The result of CT scanning, SEP and vessel B ultrasound before and after treatment in 59 cases were observed and compared. Through the study, a new point of view was suggested in the mechanism of manipulation. The manipulation did not reduce or rupture the prolapsed disc. But it can gain an active treatment by affecting the deep tissue, changing the blood circulation around the protruded mass, loosening the adhesion between the compressed nerve root and surrounding tissue.

**Key words** Lumbar disc herniation Tuina

(Original article page 3)

**Study on 3-D movement of whole lumbar spine in rotatory chiropractic**

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For the purpose of observing 3-D movement of the whole lumbar spine in rotatory chiropractic, the experimental specimen from segmental lumbar movement was changed to L1—L5 whole lumbar spine, thereby a parallel spinal 3-D movement measurement system was designed by the authors. The loading method was reformed so as to improve imitation of the chiropractic maneuver of the spine. Seven definite lumbar spinal points were set and the image developments so observed over these points were inputted into the computer system. Calculation of the quantitative 3-D movement in imitation chiropractic loading of the lumbar spine and its

posterior elements was made by rigidity transform mathematic theory of the mechanics of engineering system. According to the result of 3-D movement of whole lumbar spine in right rotation, we found the rotatory chiropractic applied on left lying position. the right facet joint process that constituted the inner wall of nerve root canal developed directional displacement. Although it may be different in separate individual segment, the displacement in the main movement axis could directly enlarge the nerve root canal, or drawing and tightening the capsule ligament of facet joint and ligament flavum in order to enlarge the nerve root canal.

**Key words** Lumbar spine 3-D movement Manipulation

(Original article page 5)

**Effect of Bushen Jiangu Tang on oxygen free radical metabolism of patients with osteoarthritis of knee joint**

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Fifty eight cases of osteoarthritis (OA) of knee joint were treated by oral taken Bushen Jiangu Tang (BSJGT). Before and after treatment the observation of oxygen free radical metabolism have been taken through the activity of superoxide dismutase (SOD) of RBC and the content of lipid peroxide (LPO) of serum. The results showed that before treatment SOD activity decreased significantly and LPO content increased markedly in patients with OA than that in controls ( $P < 0.01$ ). After treatment with BSJGT by oral administration parameter of SOD and LPO had been shown relevant improvement in the remission patients and that in the obvious effective cases returned to normal ( $P > 0.05$ ) and that in ineffective cases remained abnormal ( $P < 0.01$ ). This preliminary study suggested that

oxygen free radical might take part in the pathological process of OA and one of therapeutic mechanism of BSJGT is probably due to improving metabolic disorder of the oxygen free radical in patients with OA of knee joint.

**Key words** Bushen Jiangu Tang Osteoarthritis  
Superoxide dismutase Lipid peroxide  
Oxygen free radical

(Original article page 8)

### **Reconstructed model and biochemical indices of peri-arthritis humeroscapularis of rabbits**

**Xiong Chang—yuan et al** *Hubei College of TCM* (430061)

In this study, a model of peri-arthritis humeroscapularis in rabbits was established by constant mechanical strain and application of ice bag, and biochemical indices related to the model was measured. It shows that the level of hyperoxyproline, DNA and protein to the perimental tendon is higher than that of the normal, and all have apparent difference. It indicates that the model is similar to human peri-arthritis humeroscapularis. The authors think that the method is approximate to the cause of human peri-arthritis humeroscapularis.

**Key words** Animal experiment Rabbit Peri-arthritis humeroscapularis

(original article Page 10)

### **Therapeutic effect of manipulation in the treatment of cervical arrhythmia**

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Arrhythmia is a common syndrome, some patients can't turn to normal after taking various drugs. We used manoreduction of revolving cervical vertebrae and knee pressing thoracic vertebrae in accompany with hands pressing shoulder to correct anatomic displacement of cervical and thoracic vertebrae, which removed stimulation to cervical and thoracic sympathetic ganglia, restored the function of vegetative nervous system,

recovered arrhythmia and brought satisfactory result, therefore we called this kind of arrhythmia as cervical arrhythmia. From January 1984 to December 1993, 89 cases were observed, with 22 cases recovered; 47 marked improved, 17 improved, and 3 ineffective. The total effective rate was 96.6%. The results remained now—a—days, especially the recovery cases. The reasons for it are reposition of anatomic displacement, persistent cervical exercise by the patients themselves and alteration of their improper living habits (such as using high pillow and swinging head inadvertently).

**Key words** Manipulation Arrhythmia Deviation of spinous process

(Original article page 14)

### **Anterior dislocation of shoulder with fracture of humeral neck treated by close reduction**

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Anterior dislocation of shoulder with fracture of humeral neck is rare and severe injury. The cases in which treated successfully by close reduction were minor in the literature. In this paper 10 cases are reported. Among them, 8 cases are treated successfully by close reduction and the results are satisfaction. Based on the analysis of the mechanism, traumatic anatomy and in the operative findings, the author realizes that the key to successful close reduction is to reopen the original pathway of dislocation, thus humeral head is reduced easily from the pathway. Traction, if applied, would certainly shut up the pathway and render reduction more difficulty. Contrary to general opinion, successful close reduction can be accomplished without the use of any traction. The functional recovery of all cases in which dislocation had been reduced by close reduction were good and excellent.

**Key words** Anterior dislocation of shoulder Fracture of humeral neck Close reduction

(Original article page 39)