

doi: 10.13241/j.cnki.pmb.2017.05.022

玻璃酸钠关节腔内填充对踝关节创伤性关节炎血清 TNF- α 影响*

陈 伶¹ 曾 勇¹ 蒋 华¹ 王俊瑞¹ 黄富国²

(1 成都市第二人民医院 骨科 四川 成都 610017; 2 四川大学华西第一附属医院 骨科 四川 成都 610000)

摘要 目的:探究玻璃酸钠关节腔内填充对踝关节创伤性关节炎患者 TNF- α 及功能恢复的影响。**方法:**收集 2014 年 3 月到 2016 年 3 月来我院就诊的踝关节创伤性关节炎患者 96 例,随机分为对照组与试验组,各 48 例。对照组采用基础中医推拿按摩疗法配合常规功能训练,试验组实施玻璃酸钠关节腔内填充治疗。治疗 5 周后,比较两组患者血清炎症因子 TNF- α 水平的改变、功能恢复情况及不良反应发生率。**结果:**治疗结束后,两组 ROM 评分均较治疗前升高($P < 0.05$),血清炎症因子 TNF- α 水平较治疗前降低($P < 0.05$);与对照组相比,试验组实施玻璃酸钠关节腔内填充治疗 ROM 评分较高($P < 0.05$),血清炎症因子 TNF- α 水平较低($P < 0.05$);试验组不良反应率明显低于对照组($P < 0.05$)。**结论:**玻璃酸钠关节腔内填充对踝关节创伤性关节炎患者踝关节功能恢复效果较好,能够降低患者血清炎症因子 TNF- α 水平,改善关节功能。

关键词:玻璃酸钠;创伤性关节炎;TNF- α ;ROM

中图分类号:R684.3 **文献标识码:**A **文章编号:**1673-6273(2017)05-889-03

Effect of the Serum TNF- α by Sodium Hyaluronate Joint Cavity Filling in Patients with Traumatic Arthritis of the Ankle Joint*

CHEN Ling¹, ZENG Yong¹, JIANG Hua¹, WANG Jun-rui¹, HUANG Fu-guo²

(1 Department of orthopedics, the second people's Hospital of Chengdu, Chengdu, Sichuan, 610017, China;

2 Department of orthopedics, the First Affiliated Hospital of Sichuan University, Chengdu, Sichuan, 610000, China)

ABSTRACT Objective: To investigate the effect of sodium hyaluronate joint cavity filling on the serum levels of TNF- α in patients with traumatic arthritis of the ankle joint. **Methods:** 96 patients with traumatic arthritis of the ankle joint in our hospital from March 2014 to March 2016 were selected and randomly divided into the control group and the experiment group with 48 cases in each group. The patients in control group were treated with basic Chinese medicine massage therapy with conventional functional training, while the patients in experiment group were treated with sodium hyaluronate joint cavity filling. After 5 weeks of treatment, the TNF- α , functional recovery and incidence of adverse reactions were compared. **Results:** Compared with before treatment, the ROM score was higher ($P < 0.05$), and the serum TNF- α level was lower ($P < 0.05$). Compared with the control group, the ROM score was higher ($P < 0.05$), and the serum TNF- α level was lower ($P < 0.05$), and the adverse reaction rate was lower in the experiment group ($P < 0.05$). **Conclusions:** Sodium hyaluronate intra-articular filling has a good effect on functional recovery of ankle joint in patients with traumatic arthritis of ankle joint, which can improve ROM score and decrease serum inflammatory factor TNF- α levels.

Key words: Sodium hyaluronate; Traumatic arthritis; TNF- α ; ROM

Chinese Library Classification(CLC): R684.3 **Document code:** A

Article ID: 1673-6273(2017)05-889-03

前言

踝关节创伤性关节炎是由外伤引起的关节软骨变性、破坏,导致关节功能障碍,临床表现为踝关节疼痛、僵硬、关节活动受限等^[1]。目前,临床主要以中医推拿、按摩等治疗为主,但并发症较多,见效缓慢^[2]。玻璃酸钠是一种高分子多糖体生物材料,也是关节滑液的主要成分,能够润滑关节腔,保护关节软骨等,有研究已经证实其在创伤性关节炎中有治疗作用^[3]。TNF- α 作为一种炎症细胞因子,在创伤性关节炎的发生发展过程中起到了重要作用^[4]。临床已有研究显示玻璃酸钠用于治疗踝关节创伤性关节炎,可改善患者关节功能,但是其对 TNF- α 水平的

影响报道鲜少^[5]。本研究探讨玻璃酸钠关节腔内填充对踝关节创伤性关节炎患者 TNF- α 及功能恢复的影响。

1 资料与方法

1.1 临床资料

本研究选取 2014 年 3 月~2016 年 3 月到我院就诊的踝关节创伤性关节炎患者 96 例,患者踝关节有外伤史,临床表现为踝关节疼痛、僵硬,关节活动明显受限,经影像学检查确诊为创伤性关节炎;排除患者有痛风性关节炎、风湿性关节炎病史;排除患者凝血功能异常;排除近一周内服用止痛药物;排除患者存在严重的心脑血管、肝、肾等功能障碍。将 96 例患者随机

* 基金项目:四川省科技厅基金项目(17ZDYF2753)

作者简介:陈伶(1959-),男,副主任医师,研究方向:骨科、脊柱、关节、创伤等,电话:13076082873

(收稿日期:2016-08-07 接受日期:2016-08-26)

分配为试验组与对照组,试验组 48 例,男女比为 22/26,平均年龄(51.35 ± 9.39)岁,平均病程(2.06 ± 1.12)年;对照组 48 例,男女比为 23/25,平均年龄(50.12 ± 10.05)岁,平均病程(1.93 ± 1.25)年。两组患者一般资料在统计学上没有明显差异($P>0.05$),两组组间具有可比性。

1.2 方法

对照组采用对照组采用基础中医推拿按摩疗法,推拿按摩昆仑、太溪、丘墟、照海等穴位,每日一次,同时配合常规踝关节功能训练,嘱患者做踝关节屈伸运动、侧向运动、旋转运动等,功能训练后冰敷 15 分钟,以恢复关节功能,共治疗 5 周。试验组采用玻璃酸钠关节腔内充填治疗,患者仰卧位,足中立位,在距骨上方胫腓关节处有一三角形切迹,在此处进针,依次穿过皮肤、皮下组织及关节囊到达关节腔,抽出部分关节液,注入 2 mL 玻璃酸钠(山东博士伦福瑞达制药有限公司,国药准字 H10960136),并嘱患者活动踝关节,使其分布均匀,每周一次,5 周为一个疗程,共治疗一个疗程。所有患者治疗完成后随访半年。

1.3 观察指标

1.3.1 踝关节活动范围评定 踝关节活动范围(ROM)取 0° 为中位,分别测量并记录治疗前后踝关节活动角度,包括内收、外展、内翻及外翻等所有角度,取其平均值,记为 ROM(正常活动范围,背伸 70° ,跖屈至 140° ,约有 70° 的活动范围)。

1.3.2 血清炎性因子水平 所有患者在参与临床试验第一天早上及治疗完成最后一天早上抽取 10 mL 空腹静脉血,静置 30 分钟后,离心 $3000 \text{ rpm} \times 10 \text{ min}$,收集上清,放置在 -80°C 冰箱保存。采用酶联免疫吸附(ELISA)技术,使用 ELISA 试剂盒(上海广锐生物科技有限公司)检测血清炎性因子 TNF- α 水平。上述操作均由我院实验技术人员统一完成。

1.4 统计学方法

数据处理使用 SPSS13.0 软件进行统计学处理,关节活动范围、血清炎性因子 TNF- α 采用均数 $\pm$ 标准差表示,使用 t 检验,不良反应用率(%)表示,使用卡方检验,以 $P<0.05$ 为差异具有统计学意义。

2 结果

2.1 两组患者治疗前后关节活动范围比较

表 3 两组患者不良反应比较[例(%)]

Table 3 Comparison of the total adverse reactions in two groups(n,%)

Groups	Case	Redness and swelling of joints	Hydrops articuli	Arthralgia	Total adverse reactions
Experiment group	48	1(2.08 %)	1(2.08 %)	0(0)	2(4.16 %)*
Control group	48	8(16.67 %)	0(0)	0(0)	(16.67 %)
x2					4.019
P					0.045

Note: Compared with control group, * $P<0.05$.

3 讨论

目前研究证实^[6-8],创伤性关节炎能够造成机体局部缺血缺氧,微循环障碍。推拿按摩疗法可以改善局部血液循环,改善局

两组患者在接受治疗前,关节活动范围无明显差异($P>0.05$)。治疗后,两组患者关节活动范围均有明显改善($P<0.05$),相对于对照组,试验组关节活动范围明显提高($P<0.05$),患者关节功能恢复较好,见表 1。

表 1 两组患者治疗前后 ROM 比较($\bar{x} \pm s$)

Table 1 Comparison of the ROM score between two groups before and after treatment($\bar{x} \pm s$)

Groups	Time	ROM score
Experiment group (n=48)	Before treatment	19.48 $\pm$ 5.14
	After treatment	37.53 $\pm$ 6.59* [#]
Control group (n=48)	Before treatment	20.11 $\pm$ 5.05
	After treatment	28.37 $\pm$ 6.12*

Note: Compared with before treatment, * $P<0.05$. Compared with the control group, [#] $P<0.05$.

2.2 两组患者治疗前后血清 TNF- α 水平比较

两组患者在接受治疗前,血清炎性因子 TNF- α 无明显差异($P>0.05$)。治疗后,两组患者血清炎性因子 TNF- α 均降低($P<0.05$),且试验组低于对照组($P<0.05$)。见表 2。

表 2 两组患者治疗前后血清 TNF- α 水平比较($\bar{x} \pm s$, pg/mL)

Table 2 Comparison of serum levels of TNF- α between two groups before and after treatment($\bar{x} \pm s$, pg/mL)

Groups	Time	TNF- α
Experiment group (n=48)	Before treatment	96.11 $\pm$ 20.35
	After treatment	36.82 $\pm$ 12.34* [#]
Control group (n=48)	Before treatment	97.57 $\pm$ 19.78
	After treatment	64.21 $\pm$ 10.86*

Note: Compared with before treatment, * $P<0.05$. Compared with the control group, [#] $P<0.05$.

2.3 不良反应比较

所有患者治疗后随访半年。对照组随访中发现关节红肿 8 例,不良反应率 16.67%(8/48),而试验组随访中有 1 例关节红肿,1 例关节积液,不良反应率 4.16%(2/48),试验组不良反应发生率明显低于对照组($P<0.05$)。见表 3。

部缺血缺氧状态,从而缓解疼痛,但是传统保守治疗见效缓慢,且并发症发生率高^[9]。玻璃酸钠是一种高分子多糖体生物材料,也是关节滑液的主要成分^[10]。研究发现,当创伤性关节炎发生时,关节腔内玻璃酸钠浓度、弹性等均低于正常,关节内润滑作

用减弱,同时抵抗机械力能力也减弱,从而使关节发生损伤,出现关节疼痛、活动障碍等^[11-13]。因此外源性关节腔内充填玻璃酸钠能够恢复关节组织的粘弹性,润滑关节腔,保护关节软骨,从而改善关节功能^[14,15]。本研究结果显示,试验组实施玻璃酸钠关节腔内充填治疗后,关节活动范围明显提高,患者关节功能恢复较好,同时随访发现试验组不良反应发生率明显低于对照组。结果说明玻璃酸钠关节腔内填充治疗较传统治疗方法具有显著的临床疗效与优势。

近年来研究发现 TNF- α 不仅参与类风湿性关节炎,同时在创伤性关节炎的发生发展中起重要作用^[16,17]。TNF- α 能够激活 NF- κ B 炎症信号通路,启动炎症相关基因的表达,从而有利于疾病的进展^[18-20]。本研究发现,治疗后两组患者血清炎症因子 TNF- α 均降低($P<0.05$),且试验组低于对照组($P<0.05$)。推测玻璃酸钠治疗创伤性关节炎的机制可能是通过降低 TNF- α 水平,降低机体内炎症因子水平,延缓创伤性关节炎病情的进展。

综上所述,玻璃酸钠关节腔内填充对踝关节创伤性关节炎患者踝关节功能恢复效果较好,患者 ROM 评分明显提高, TNF- α 水平明显降低,不良反应率低,值得临床应用并推广。

参考文献(References)

- [1] Shearer D W, Chow V, Bozic K J, et al. The predictors of outcome in total knee arthroplasty for post-traumatic arthritis[J]. The Knee, 2013, 20(6): 432-436
- [2] Ma V Y, Chan L, Carruthers K J. Incidence, prevalence, costs, and impact on disability of common conditions requiring rehabilitation in the United States: stroke, spinal cord injury, traumatic brain injury, multiple sclerosis, osteoarthritis, rheumatoid arthritis, limb loss, and back pain [J]. Archives of physical medicine and rehabilitation, 2014, 95(5): 986-995
- [3] Mansat P, Bonneville N, Rongière M, et al. Experience with the Coonrad-Morrey total elbow arthroplasty: 78 consecutive total elbow arthroplasties reviewed with an average 5 years of follow-up[J]. Journal of Shoulder and Elbow Surgery, 2013, 22(11): 1461-1468
- [4] Barthel P Y, Mansat P, Sirveaux F, et al. Is total elbow arthroplasty indicated in the treatment of traumatic sequelae® 19 cases of Coonrad-Morrey? reviewed at a mean follow-up of 5.2 years [J]. Orthopaedics & Traumatology: Surgery & Research, 2014, 100(1): 113-118
- [5] Park S E, Kim J Y, Cho S W, et al. Complications and revision rate compared by type of total elbow arthroplasty [J]. Journal of Shoulder and Elbow Surgery, 2013, 22(8): 1121-1127
- [6] Barlow J D, Morrey B F, O'Driscoll S W, et al. Activities after total elbow arthroplasty[J]. Journal of Shoulder and Elbow Surgery, 2013, 22(6): 787-791
- [7] Rammelt S, Zwipp H. Corrective arthrodeses and osteotomies for post-traumatic hindfoot malalignment: indications, techniques, results [J]. International orthopaedics, 2013, 37(9): 1707-1717
- [8] Guild G N, Labib S A. Clinical outcomes in high flexion total knee arthroplasty were not superior to standard posterior stabilized total knee arthroplasty. A multicenter, prospective, randomized study [J]. The Journal of arthroplasty, 2014, 29(3): 530-534
- [9] Fan W L, Sun H Z, Wu S Y, et al. Subtalar distraction osteogenesis for posttraumatic arthritis following intra-articular calcaneal fractures[J]. Foot & ankle international, 2013, 34(3): 398-402
- [10] Olson S A, Furman B D, Kraus V B, et al. Therapeutic opportunities to prevent post-traumatic arthritis: Lessons from the natural history of arthritis after articular fracture [J]. Journal of Orthopaedic Research, 2015, 33(9): 1266-1277
- [11] Churchill R S. Stemless shoulder arthroplasty: current status[J]. Journal of Shoulder and Elbow Surgery, 2014, 23(9): 1409-1414
- [12] Little C B, Hunter D J. Post-traumatic osteoarthritis: from mouse models to clinical trials [J]. Nature Reviews Rheumatology, 2013, 9(8): 485-497
- [13] Yu X, Pang Q J, Chen L, et al. Postoperative complications after closed calcaneus fracture treated by open reduction and internal fixation: A review[J]. Journal of International Medical Research, 2014, 42(1): 17-25
- [14] Bini S A, Khatod M, Inacio M C S, et al. Same-day versus staged bilateral total knee arthroplasty poses no increase in complications in 6672 primary procedures[J]. The Journal of arthroplasty, 2014, 29(4): 694-697
- [15] Denard P J, Raiss P, Sowa B, et al. Mid-to long-term follow-up of total shoulder arthroplasty using a keeled glenoid in young adults with primary glenohumeral arthritis [J]. Journal of Shoulder and Elbow Surgery, 2013, 22(7): 894-900
- [16] Shakked R J, Tejwani N C. Surgical treatment of talus fractures[J]. Orthopedic Clinics of North America, 2013, 44(4): 521-528
- [17] Meng L, Zhang Y, Lu Y. Three-dimensional finite element analysis of mini-external fixation and Kirschner wire internal fixation in Bennett fracture treatment [J]. Orthopaedics & Traumatology: Surgery & Research, 2013, 99(1): 21-29
- [18] Coleman H, Chandraratnam E, Morgan G, et al. Synovial chondrosarcoma arising in synovial chondromatosis of the temporomandibular joint[J]. Head and neck pathology, 2013, 7(3): 304-309
- [19] Otto R J, Mulieri P J, Cottrell B J, et al. Arthrodesis for failed total elbow arthroplasty with deep infection [J]. Journal of Shoulder and Elbow Surgery, 2014, 23(3): 302-307
- [20] Bennett J M. Elbow arthroscopy: the basics [J]. The Journal of hand surgery, 2013, 38(1): 164-167