早期康复对冠状动脉旁路移植术后患者的疗效分析

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摘要 目的: 通过对比围手术期的宣教指导与一对一康复训练对冠状动脉旁路移植术后患者运动能力、日常生活活动能力、疼痛及心理状态的作用, 分析早期综合康复介入对患者术后恢复的影响。**方法:** 选取瑞金医院心外科收治的 204 例冠状动脉旁路移植(CABG)术后患者, 随机分为康复组和对照组各 102 例。2 组均予以常规术后护理, 康复组在术后 24 h 内开始进行在专业康复治疗师监督下的系统康复训练(包括呼吸、气道廓清、运动、心理等方面), 每次训练时间为 30 min, 每天 2 次, 每周 5 d, 持续 1 周; 对照组予以康复宣教。在术后第 7 天对 2 组进行生活质量、疼痛、6 min 步行试验和心理状态评估, 比较 2 组身心功能状况及运动能力。**结果:** 术后第 7 天康复组受试者 6 min 步行实验、改良 Barthel 指数(MBI)评分分别为(354.75±85.83) m、(92.79±5.34)分, 高于对照组的(295.60±67.83) m、(83.82±6.22)分, 差异均有统计学意义($P<0.001$); 康复组受试者 VAS 疼痛评分、汉密尔顿抑郁量表(HAMD)、汉密尔顿焦虑量表(HAMA)分别为(1.19±0.55)(10.46±8.21)(11.36±4.87)分, 低于对照组(1.88±1.29)(17.22±6.15)(19.58±6.72)分, 差异均有统计学意义($P<0.001$)。**结论:** 术后 24 h 内开始进行专业康复指导下的系统康复训练能有效改善冠状动脉旁路移植术后患者的运动能力、心理状态及日常生活活动能力。

关键词 冠状动脉旁路移植; 心脏康复; 早期康复; 重症康复

冠状动脉旁路移植(coronary artery bypass grafting, CABG)是三支冠状动脉严重病变冠心病患者有效的治疗方案之一^[1]。随着手术技术的不断革新, 术后生存率逐渐提高, 继而患者的术后生存质量问题受到了广泛关注。现代心脏康复研究提示, 早期接受康复治疗的 CABG 术后患者除了生存期延长之外, 术后功能障碍发生率也显著降低^[2-3]。近年来, 我国逐渐意识到康复介入对 CABG 术后患者的重要性, 心脏康复治疗逐渐在临床中推广^[4-6], 但尚缺少超早期康复介入对 CABG 术后患者影响的相关研究, 康复训练模式也未得到统一^[7]。本研究针对 CABG 术后患者进行早期康复干预, 并通过运动能力、日常生活活动能力、疼痛以及心理状态等方面

综合观察早期康复介入对冠状动脉旁路移植术后患者的疗效, 现介绍如下。

1 临床资料

1.1 病例选择标准

1.1.1 纳入标准 ① 同组医生进行 CABG 手术的患者; ② 术后患者于同一病区接受常规康复指导及护理; ③ 未合并其他系统疾病; ④ 未合并胸部创伤、肿瘤等; ⑤ 既往无开胸手术史; ⑥ 生命体征平稳, 无认知障碍。

1.1.2 排除标准 ① 存在严重术后并发症; ② 手术切口感染; ③ 继发心脑血管等其他疾病。

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1.2 一般资料

本研究通过上海瑞金康复医院伦理委员会批准,选取 2016 年 9 月—2017 年 11 月期间瑞金医院心外科 CABG 术后患者共 204 例,其中男 118 例,女 86 例;平均年龄(47.15 ± 12.40)岁,并与入组患者家属签署知情同意书。所有患者均经冠状动脉造影确诊存在左冠状动脉所包含的前降支、回旋支以及右冠状动脉三支病变,管腔重度狭窄 $>75\%$;心脏超声

提示患者心脏均存在不同程度的扩大。采用动态随机化(最小化)的分组方法将患者分为康复组和对照组,每组各 102 例。2 组干预前性别、年龄、身高、体质量、纽约心脏病学会(NYHA)心功能分级^[8]及术前疼痛视觉模拟评分(visual analogue scale,VAS)等一般资料比较,差异无统计学意义($P>0.05$),见表 1。

表 1 2 组一般资料比较($\bar{x} \pm s$)

Table 1 Comparison of general data between two groups ($\bar{x} \pm s$)

组别	n	性别		年龄/岁	身高/cm	体质量/kg	心功能分级/级	术前 VAS 评分
		男	女					
对照组	102	60	42	45.67 ± 11.68	167.57 ± 11.21	66.14 ± 8.30	1.75 ± 0.65	2.22 ± 1.08
康复组	102	58	44	48.62 ± 12.98	166.61 ± 10.67	65.97 ± 8.64	1.83 ± 0.67	2.03 ± 1.04

2 方法

2.1 治疗方法

2 组均给予 CABG 术后常规护理。

2.1.1 康复组 参考国内现有冠心病康复标准程序^[9]并结合国外近年心脏围术期康复最新进展^[10-11]。常规心脏康复运动方案包括运动能力训练、呼吸训练(气道廓清、提升潮气量等)、心脏相关危险因素控制、相关疾病教育以及心理教育等术后早期康复介入策略,并配合心理干预。自重症加强护理病房开始,根据患者个体情况进行心脏康复活动,从运动能力、营养、睡眠、心理、呼吸功能、心功能等方面评估患者情况,为选择适宜心脏康复措施提供重要参考。如采用 Borg 评分量表评估患者疲劳指数,根据患者体力情况选择适宜强度康复方式。当一位患者在完成当次训练后循环稳定,且 Borg 评分量表 12~13 分及以下,下次训练时即可将训练量增加 10%~15%。反之,如果患者感到疲惫或体弱,则需要降低训练强度或缩短锻炼时间,延长间隔长度,并建议辅以营养支持。

2.1.2 对照组 仅接受术后康复宣教,宣教内容同康复组训练内容,但未接受专业康复治疗师监督指导下的康复训练。训练方式将根据患者术后情况,按照恢复时间及情况循序渐进给予患者床上活动、呼吸训练、日常生活活动及步行等体能活动。具体流程如下:①患者术后第 1~2 天以床上活动为主,并辅助患者进行翻身训练,卧位到坐位,进行呼吸训练及气道廓清训练 10~15 min,鼓励患者进行四肢各关节主动活动(取血管的肢体需重点进行活动),

并指导使用呼吸锻炼器。②患者术后第 3~4 天可进行适当的床下活动,床边坐起站立,辅助下步行 50 m,可进行简单的洗漱、如厕等日常生活活动能力训练,其余治疗同前一步。③患者术后第 5~6 天增加床下活动运动量,少量辅助下步行 100 m,若可能进行登楼梯训练,以加强日常生活活动能力。④患者术后第 7 天,给予出院后各方面指导,督促患者自我管理。

院内康复期间采用 Borg 评分量表评估患者的疲劳程度,根据患者自身体力状况适当调整运动强度。训练期间始终强调切勿屏气,防止增加心脏负担。每次康复训练强度为 30 min,每天 2 次,每周 5 d。

2.2 观察指标

2 组均于术后第 7 天进行生活质量、疼痛、运动功能及心理状态评估,具体方法如下:

2.2.1 改良 Barthel 指数 采用改良 Barthel 指数(modified Barthel index,MBI)对患者进食、洗澡、修饰、穿衣、如厕、床椅转移、平地走、上下楼梯、大便、小便 10 个方面进行日常生活能力评估,分数越高,日常生活活动能力越好^[12]。

2.2.2 VAS 使用刻有数字刻度长 10 cm 的卡尺(0 cm 处表示无痛,4 cm 表示疼痛影响睡眠,10 cm 表示疼痛最剧烈),实验人员指导患者在卡尺上标出最能代表当前疼痛程度的部位。

2.2.3 6 min 步行试验 在心脏外科病房治疗区域量取 50 m 长的距离,起止点两端各放一把椅子,作为距离标记,必要时患者也可休息使用。行走前告知患者以可以承受的速度在这两把椅子之间来回行走,共计算步行 6 min 距离。要求行走时沿直线尽

可能快速行走,若感觉疲惫可休息或放慢速度,其6 min 内完成的最大距离即为试验结果^[13]。试验过程中评估者对患者的心率、血氧进行监测,全程配有一名急救医生,现场备硝酸甘油、除颤仪等抢救用品。

2.2.4 心理状态评分 采用国际通用的汉密尔顿抑郁量表(HAMD)和汉密尔顿焦虑量表(HAMA)^[14]对2组均进行焦虑评分和抑郁评分。所有评估均由2名接受过专业培训的人员进行,结果取平均值。

2.3 统计学方法

将研究数据导入 SPSS 19.0 软件进行统计分析。呈正态分布的计量资料以($\bar{x}\pm s$)表示,组间比较采用成组 *t* 检验;对偏态分布的计量资料以及等级资料使用 Wilcoxon 秩和检验。*P*<0.05 为差异有统计学意义。

3 结 果

3.1 2组术后 MBI 评分比较

见表 2。

表 2 2 组术后 MBI 评分比较 ($\bar{x}\pm s$) 分
Table 2 Comparison of MBI scores after operation between two groups ($\bar{x}\pm s$) Scores

组 别	<i>n</i>	MBI 评分
对照组	102	83.82±6.22
康复组	102	92.79±5.34
<i>Z</i> 值		-9.405
<i>P</i> 值		<0.001

3.2 2组术后 VAS 评分比较

见表 3。

表 3 2 组术后 VAS 评分比较 ($\bar{x}\pm s$) 分
Table 3 Comparison of VAS scores after operation between two groups ($\bar{x}\pm s$) Scores

组 别	<i>n</i>	VAS 评分
对照组	102	1.88±1.29
康复组	102	1.19±0.55
<i>Z</i> 值		7.159
<i>P</i> 值		<0.001

3.3 2组术后 6 min 步行试验比较

见表 4。

表 4 2 组术后 6 min 步行试验比较 ($\bar{x}\pm s$)
Table 4 Comparison of 6-min walking test after operation between two groups ($\bar{x}\pm s$) m

组 别	<i>n</i>	步行距离
对照组	102	295.60±67.83
康复组	102	354.75±85.83
<i>t</i> 值		5.461
<i>P</i> 值		<0.001

3.4 2组术后 HAMD、HAMA 评分比较

见表 5。

表 5 2 组术后 HAMD、HAMA 评分比较 ($\bar{x}\pm s$) 分
Table 5 Comparison of HAMD and HAMA scores after operation between two groups ($\bar{x}\pm s$) Scores

组 别	<i>n</i>	HAMD 评分	HAMA 评分
对照组	102	17.22±6.15	19.58±6.72
康复组	102	10.46±8.21	11.36±4.87
<i>t</i> 值		-6.656	-10.003
<i>P</i> 值		<0.001	<0.001

4 讨 论

需进行 CABG 的患者通常病情较危重,甚至在术后早期时生命体征仍不平稳,因此进行超早期康复介入有一定难度^[15-16]。在对早期康复训练安全性的探讨中,仍有部分质疑是否会造成风险^[17]。LIE 等^[18]研究表明,在经历 CABG 术后的前 2 周,患者经常会由于对术后疼痛的焦虑、日常活动的体验改变,担忧是否能返回工作等问题影响患者的功能水平恢复。本次研究表明,在冠状动脉旁路移植术后早期进行适当的康复训练干预可以不同程度地提高患者运动功能、生活质量和心理状态。在康复治疗师监督训练的康复组患者中,均无报告致命并发症和紧急除颤事件。本次研究与 DONG 等^[19]研究结论相符,均表明 CABG 术后患者的早期康复有助于患者更快地回归正常生活。此外,另有多项康复治疗对心脏疾患患者的安全性研究均显示专业人士指导下的早期运动康复训练造成的风险极低^[20-22]。

6 min 步行试验对于心外科术后患者是一种可行、有效的检测运动能力方法。一项涵盖 2 500 例

心外科术后患者(65% CABG)的研究中显示,CABG术后患者2周后6 min步行距离约为(302±89)m,康复干预可显著提高步行距离^[23]。除运动能力受限外,患者的心理状态方面也存在较大压力。有研究提示,CABG术后患者住院期间焦虑、抑郁发生率分别为34%和28%^[24]。在现代心理-生物-社会现代医学模式指导下,CABG术后心脏康复应从心脏疾病患者生理、心理及日常生活活动方式等方面进行干预。通过在术后早期床旁一对一的治疗,主要内容包括康复评估、运动处方制定及执行、心血管危险因素控制、疾病相关教育、心理疏导等及不良生活习惯的纠正^[25],患者术后运动能力、心理状态、日常生活能力、疼痛方面均有不同程度的改善。本课题小组基于国内心脏康复程序及部分国外研究进展,在CABG术后1~2 d即对患者实施运动疗法、呼吸训练以及心理咨询治疗,研究表明早期院内的心脏康复干预具有显著的治疗效果,可以有效增加患者活动能力,提高患者的生活质量和心理状态水平,具有临床推广意义。

参考文献

- [1] PATEL M R, DEHMER G J, HIRSHFELD J W, et al. ACCF/SCAI/STS/AATS/AHA/ASNC/HFSA/SCCT 2012 Appropriate use criteria for coronary revascularization focused update: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, Society for Cardiovascular Angiography and Interventions, Society of Thoracic Surgeons, American Association for Thoracic Surgery, American Heart Association, American Society of Nuclear Cardiology, and the Society of Cardiovascular Computed Tomography [J]. *J Am Coll Cardiol*, 2012, 59(9): 857-881.
- [2] ANDERSON L, OLDRIDGE N, THOMPSON D R, et al. Exercise-based cardiac rehabilitation for coronary heart disease: cochrane systematic review and meta-analysis [J]. *J Am Coll Cardiol*, 2016, 67(1): 1-12.
- [3] 励建安. 国际心脏康复研究的新趋向[J]. *中国康复医学杂志*, 2002, 17(1): 10-13.
- [4] 陈伟伟, 高润霖, 刘力生, 等. 《中国心血管病报告 2015》概要[J]. *中国循环杂志*, 2016, 31(6): 521-528.
- [5] 曹小翠. 广东省 25 家医院 I 期心脏康复开展状况调查分析[J]. *护理学报*, 2012, 19(3B): 28-30.
- [6] 朱佳琪, 马跃文, 谷天祥, 等. 冠状动脉旁路移植术后患者 I 期心脏康复治疗的临床疗效研究[J]. *中国全科医学*, 2015, 18(20): 2388-2392.
- [7] 倪叶彬, 段霞, 姜金霞, 等. 冠状动脉搭桥术后患者运动康复的研究进展[J]. *中国实用护理杂志*, 2017, 33(17): 1348-1351.
- [8] CHARLSON M E, POMPEI P, ALES K L, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation [J]. *J Chronic Dis*, 1987, 40(5): 373-383.
- [9] 纪树荣. 康复医学[M]. 北京: 高等教育出版社, 2004: 237-245.
- [10] ADES P A, SAVAGE P D, BRAWNER C A, et al. Aerobic capacity in patients entering cardiac rehabilitation [J]. *Circulation*, 2006, 113(23): 2706-2712.
- [11] BALADY G J, WILLIAMS M A, ADES P A, et al. Core components of cardiac rehabilitation/secondary prevention programs: 2007 update [J]. *Circulation*, 2007, 115(20): 2675-2682.
- [12] LEUNG S O, CHAN C C, SHAH S. Development of a Chinese version of the Modified Barthel Index— validity and reliability [J]. *Clin Rehabil*, 2007, 21(10): 912-922.
- [13] GOEL K, PACK Q R, LAHR B, et al. Cardiac rehabilitation is associated with reduced long-term mortality in patients undergoing combined heart valve and CABG surgery [J]. *Eur J Prev Cardiol*, 2015, 22(2): 159-168.
- [14] 张明园. 精神科评定量表手册[M]. 长沙: 湖南科学技术出版社, 1993: 134-135.
- [15] ROLFSON D B, MCELHANEY J E, ROCKWOOD K, et al. Incidence and risk factors for delirium and other adverse outcomes in older adults after coronary artery bypass graft surgery [J]. *Can J Cardiol*, 1999, 15(7): 771-776.
- [16] NALYSNYK L, FAHRBACH K, REYNOLDS M W, et al. Adverse events in coronary artery bypass graft (CABG) trials: a systematic review and analysis [J]. *Heart*, 2003, 89(7): 767-772.
- [17] PAVY B, LLIU M C, MEURIN P, et al. Safety of exercise training for cardiac patients: results of the French registry of complications during cardiac rehabilitation [J]. *Arch Intern Med*, 2006, 166(21): 2329-2334.
- [18] LIE I, BUNCH E H, SMEBY N A, et al. Patients' experiences with symptoms and needs in the early rehabilitation phase after coronary artery bypass grafting [J]. *Eur J Cardiovasc Nurs*, 2012, 11(1): 14-24.
- [19] DONG Z, YU B, ZHANG Q, et al. Early rehabilitation therapy is beneficial for patients with prolonged mechanical ventilation after coronary artery bypass surgery [J]. *Int Heart J*, 2016, 57(2): 241-246.
- [20] SAITO M, UESHIMA K, SAITO M, et al. Safety of exercise-based cardiac rehabilitation and exercise testing for cardiac patients in Japan: a nationwide survey [J]. *Circ J*, 2014, 78(7): 1646-1653.
- [21] KIM C, CHANG J M, MIN H L. Safety of monitoring exercise for early hospital-based cardiac rehabilitation [J]. *Ann Rehabil Med*, 2012, 36(2): 262-267.
- [22] HODGSON C L, CAPELL E, TIPPING C J. Early mobilization of patients in intensive care: organization, communication and safety factors that influence translation into clinical practice [J]. *Critical Care*, 2018, 22(1): 77.
- [23] FIORINA C, VIZZARDI E, LORUSSO R, et al. The 6-min walking test early after cardiac surgery. Reference values and the effects of rehabilitation programme [J]. *Eur J Cardiothorac Surg*, 2007, 32(5): 724-729.
- [24] SHARIF F, SHOUL A, JANATI M, et al. The effect of cardiac rehabilitation on anxiety and depression in patients undergoing cardiac bypass graft surgery in Iran [J]. *BMC Cardiovasc Disord*, 2012, 12: 40.
- [25] ANDERSON L, OLDRIDGE N, THOMPSON D R, et al. Exercise-based cardiac rehabilitation for coronary heart disease: cochrane systematic review and meta-analysis [J]. *J Am Coll Cardiol*, 2016, 67(1): 1-12.

Clinical Effect on Early Rehabilitation Intervention of Patients after Coronary Artery bypass Grafting

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ABSTRACT Objective: To investigate the clinical effects of perioperative education and one-to-one rehabilitation training on patients undergoing coronary artery bypass grafting (CABG) surgery through exercise ability, pain, activities of daily living and mental status. **Methods:** A total of 204 patients in Ruijin Hospital of School of Medicine, Shanghai Jiaotong University, undergoing coronary artery bypass grafting were randomly divided into rehabilitation group and control group, with 102 cases in each group. Both groups were given routine post-operative care, and the patients in the rehabilitation group took part in an organized rehabilitation program and special instructional training related to diet and activities such as breathing, airway clearance, exercise and psychology education. The rehabilitation program started from the first 24 hours after surgery. The patients in the control group were given health education. The whole duration of the training last for 5 days in one week and twice in one day, 30 minutes in every training. On the 7th day after the operation, quality of life assessment, pain, 6-min walking test and mental status were performed to compare the health status, psychological status, and the relative walking distance were compared between the two groups. **Results:** On the 7th day after the operation, 6-min walking test and the modified Barthel index (MBI) in the rehabilitation group were (354.75±85.83) metres and (92.79±5.34) scores respectively, which were significantly higher than the (295.60±67.83) metres and (83.82±6.22) scores in the control group ($P<0.001$). In addition, visual analogue scale (VAS) scores, Hamilton depression scale (HAMD) scores and Hamilton anxiety scale (HAMA) scores in the rehabilitation group were (1.19±0.55) scores, (10.46±8.21) scores and (11.36±4.87) scores respectively, which were significantly lower than those of the control group [(1.88±1.29) scores, (17.22±6.15) scores, (19.58±6.72) scores, $P<0.001$]. **Conclusion:** Early in-hospital cardiac rehabilitation intervention can effectively increase the 6-min walking distance, improve the patients' mental status and quality of life, and relieve pain.

KEY WORDS coronary artery bypass grafting; cardiac rehabilitation; early rehabilitation; intensive rehabilitation

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Effect of Electroacupuncture on Key Muscles on Motor Function Recovery of Lower Limbs in Patients with Incomplete Spinal Cord Injury

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ABSTRACT Objective: To observe the effects of electroacupuncture on key muscles on motor function of lower limb in patients with incomplete spinal cord injury. **Methods:** A total of sixty patients with incomplete spinal cord injury were divided into control group and treatment group of 30 cases respectively according to the random number table method. The control group was treated with conventional rehabilitation; on the basis of this, the treatment group was treated with electroacupuncture on key muscles, and different acupuncture points were selected for treatment of key muscles of lower limbs according to different dysfunctions of the patients, once a day, five times a week, a total of 6 weeks' treatment. Patients were assessed with American Spinal Injury Association (ASIA) lower extremity exercise score (LEMS), modified Barthel index (MBI) score, and modified Ashworth scale (MAS) before and after 6 weeks' treatment, respectively. The two groups were compared in terms of limb motor function, spasm level, and daily living ability, the improvement situation. **Results:** There was no significant difference in LEMS, MBI and MAS before treatment between the two groups ($P>0.05$). After 6 weeks' treatment, the indicators of the two groups were compared with those before treatment, and the improvement was statistically significant ($P<0.05$). At the end of treatment, the LEMS, MBI and MAS scores of the treatment group were (8.87±1.36), (19.33±6.12) and (1.40±0.56), which were better than those of the control group (6.13±1.31), (15.00±6.43) and (0.97±0.61), and the differences were statistically significant ($P<0.05$). It showed that motor function, spasm level and daily life activity ability of the two groups were improved after treatment, and the improvement degree in the treatment group was significantly better than that in the control group. **Conclusion:** The electroacupuncture on key muscles combined with rehabilitation training is effective in improving motor function of lower limb and self-care ability in patients with incomplete spinal cord injury. It is of great significance for the patient's lower limb muscle strength recovery and early restoration of walking function.

KEY WORDS incomplete spinal cord injury; motor function of lower limb; electroacupuncture; key muscles

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