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核心稳定性训练对痉挛型脑性瘫痪患儿爬行能力及日常生活活动能力的影响

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摘要 目的：研究核心稳定性训练（CST）对痉挛型脑性瘫痪（SCP）患儿爬行能力及日常生活活动能力的影响。**方法：**选择从2015年1月到2017年2月期间在我院接受治疗的SCP患儿134例纳入本次研究，根据随机数字表法将患儿分成观察组及对照组，各67例，对照组给予常规训练，观察组则给予CST，两组均治疗3个月。对比两组疗效、治疗前及治疗3个月后的爬行能力评分以及日常生活活动能力评分。**结果：**观察组的总有效率是95.52%，明显高于对照组的85.07%，差异有统计学意义（P＜0.05）。治疗3个月后两组的爬行能力评分均分别高于治疗前，且观察组高于对照组，差异均有统计学意义（均P＜0.05）。治疗3个月后两组的日常生活活动能力各项评分均分别高于治疗前，且观察组高于对照组，差异均有统计学意义（均P＜0.05）。**结论：**CST对SCP患儿的爬行能力及日常生活活动能力具有较好的改善作用，临床治疗过程中可应用此种训练措施强化患儿的运动功能，从而促进其获得更好的预后，值得给予推广。

关键词：核心稳定性训练；脑性瘫痪；患儿；爬行能力；日常生活活动能力

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Effect of Core Stability Training on Crawling Ability and Activities of Daily Living Ability in Children with Spastic Cerebral Palsy

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ABSTRACT Objective: To study the effect of core stability training (CST) on crawling ability and activities of daily living ability in children with spastic cerebral palsy (SCP). **Methods:** A total of 134 children with SCP, who were treated in Chengdu Women and Children's Central Hospital from January 2015 to February 2017, were enrolled in this study and were randomly divided into observation group(n=67) and control group(n=67). The control group was given routine training, while the observation group was given CST, the two groups were treated for 3 months. The curative effect of the two groups, climbing ability scores and activities of daily living ability scores before and after 3 months of treatment were compared. **Results:** The total effective rate (95.52%) of the observation group was significantly higher than that(85.07%) of the control group, the difference was statistically significant (P<0.05). After 3 months of treatment, the climbing ability scores in the two groups were higher than those before treatment, and the observation group was higher than the control group, the difference was statistically significant (P<0.05). After 3 months of treatment, the activities of daily living ability scores in the two groups was significantly higher than those before treatment, and the observation group was higher than the control group, the difference was statistically significant (P<0.05). **Conclusion:** CST can improve the crawling ability and activities of daily living ability in children with SCP. The training measures can be applied to strengthen the motor function of children in the course of clinical treatment, so as to promote a better prognosis,which is worthy to be promoted.

Key words: Core stability training; Spastic cerebral palsy; Children; Crawling ability; Activities of daily living ability

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前言

脑性瘫痪（Cerebral palsy, CP）主要是指孕期至婴儿出生之后1个月内由发育缺陷和非进行型脑损伤造成的综合征，以痉挛型CP（Spastic cerebral palsy, SCP）为主要临床分型，该病临床表现包括运动障碍以及姿势异常等[1-3]。临床调查显示，伴随医疗技术的发展以及监护水平的提高，新生儿临床死亡率得到显著降低，但是SCP发病率却呈上升趋势[4,5]。SCP所伴有的原发性运动功能障碍会导致患儿躯体活动受到限制，同时会加重肌无力程度，从而影响肌肉生理情况，缩小关节活动范围[6,7]。由于SCP患儿运动长期受到限制，其运动功能会逐渐发展成代偿型运动模式，对其生活及身体发育造成严重不良影响，因此

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SCP 受到社会各界高度关注。目前对于 SCP 的治疗临床通常以康复治疗作为主要方式，但其物理治疗多局限于肢体肌肉相关训练，缺乏核心稳定性方面的针对性训练[8,9]。有报道指出，核心稳定性训练（Core stability training, CST）有助于提高骨盆以及躯干等部位的运动控制力，能辅助 SCP 患儿的康复[10,11]。本文通过研究分析 CST 对 SCP 患儿爬行能力及日常生活活动能力的影响，旨在为改善 SCP 患儿的预后提供科学的方案支持，现报道如下。

1 资料和方法

1.1 一般资料

选择从 2015 年 1 月到 2017 年 2 月在我院接受治疗的 SCP 患儿 134 例纳入本次研究，入选标准：（1）符合我国康复医学会下属儿童专业康复委员会所指定的 SCP 诊断标准 [12]；（2）患儿病情较为稳定，能够接受指令性动作；（3）患儿的病历资料均齐全，且其家长均对此次研究知情同意，并已签署了同意书。排除标准：（1）其他种类的脑部疾病者；（2）无法配合训练者；（3）研究期间失访者；（4）其他进行性的疾病引起的运动发育过程滞后者。根据随机数字表法将患儿分成观察组及对照组，各 67 例，其中观察组男 35 例，女 32 例；年龄 10～37 个月，平均（25.83± 2.02）个月；偏瘫类型：双侧瘫下肢为主型 41 例，四肢瘫痪型 14 例，偏瘫型 12 例。对照组有男 37 例，女 30 例；年龄 12～38 个月，平均（25.79± 2.13）个月；偏瘫类型：双侧瘫下肢为主型 40 例，四肢瘫痪型 15 例，偏瘫型 12 例。将以上两组的资料数据实施比较后显示的差异无统计学意义（P＞0.05）。此次研究已经获得了我院的伦理委员会评审通过。

1.2 研究方法

对照组给予常规训练，每日进行两次物理治疗，并通过理疗和体疗相结合的按摩方式帮助患儿松弛肌肉，从而改善其下肢运动功能。观察组则给予 CST，具体步骤为：（1）为患儿实施头部控制训练：经医护人员引导后俯卧于巴士球上实施俯冲训练，依患儿实际情况要求其做仰卧起坐等训练；（2）为患儿实施坐位平衡训练：实施腹部按压亦或是腰部的加压训练；（3）为患儿实施爬行训练：要求患儿保持手、膝支撑的 4 点跪位，再对患儿的髋部实施垂直加压，掌握其可承受范围后缓慢加压，随后要求患儿实施下肢体交替性运动训练以及四肢爬位的训练。以上训练过程中，均应通过循序渐进的方式进行，且在训练过程中需确保患儿可耐受。两组均训练 3 个月。

1.3 观察指标

随访 3 个月后，对比两组疗效、治疗前及治疗 3 个月后的爬行能力评分以及日常生活活动能力评分。其中爬行能力评分根据重庆医科大学附属儿童医院所制定的婴幼儿脑瘫评测表进行评定[13]，此量表共 13 项内容，每项根据患儿的完成情况分别记为 0～3 分不等，总分 39 分。爬行能力评分 = 各项实际得分值之和 / 最大评分× 100。分值越高，表示患儿的爬行功能越好。日常生活活动能力的评价用粗大运动功能检测量表进行评价[14]，其包括 88 个项目，根据患儿的完成情况分别记为 0～3 分不等，其中卧位与翻身总分 51 分；坐位总分 60 分；爬与跪总分 42 分；站与立总分 39 分；行走与跑跳总分 72 分。各项分值越高，表示患儿的日常生活活动能力也越好。

1.4 疗效评价[15]

痊愈：患儿的各项 SCP 临床症状均已消失，且爬行能力评分值＞37 分；显效：患儿的各项 SCP 临床症状均有所缓解，且爬行能力评分值＞28 分；有效：患儿的 SCP 临床症状有所缓解，且爬行能力评分值＞20 分；无效：未达到上述标准者。总有效率 =（痊愈者 + 显效者 + 有效者）/ 总例数× 100%。

1.5 统计学方法

通过 SPSS21.0 统计软件实施数据处理分析，其中计数资料用（n，%）表示，其比较选择 x^2 检验。计量资料用（$\bar{x}$± s）表示，其比较选择 t 检验，P<0.05 为差异有统计学意义。

2 结果

2.1 两组疗效对比

观察组的总有效率是 95.52%，高于对照组的 85.07%，差异有统计学意义（P＜0.05），见表 1。

表 1 两组疗效对比[n(%)]

Table 1 Comparison of curative effect between the two groups[n(%)]

Groups	Cure	Apparent effect	Effective	Invalid	Total effective rate
Observation group(n=67)	13(19.40)	37(55.22)	14(20.90)	3(4.48)	64(95.52)
Control group(n=67)	9(13.43)	23(34.33)	25(37.31)	10(14.93)	57(85.07)
x^2	0.870	5.915	4.376	4.174	4.174
P	0.351	0.015	0.036	0.041	0.041

2.2 两组爬行能力评分的对比

治疗前观察组爬行能力评分为（20.12± 4.33）分，对照组爬行能力评分为（20.23± 5.64）分，两组比较差异无统计学意义（t=0.127，P=0.899）。治疗 3 个月后观察组爬行能力评分为（31.29± 3.57）分，对照组爬行能力评分为（26.78± 3.19）分，两组爬行能力评分均分别高于治疗前，差异有统计学意义（t=16.292、8.274，P=0.000、0.000），且观察组高于对照组，差异有统计学意义（t=7.711，P=0.000）。

2.3 两组日常生活活动能力评分的对比

治疗前两组的日常生活活动能力评分相比差异无统计学意义（P＞0.05）。治疗 3 个月后两组的日常生活活动能力各项评分均分别高于治疗前，且观察组高于对照组，差异均有统计学意义（均 P＜0.05），见表 2。

3 讨论

CP 的临床分型十分复杂，目前以 SCP 较为常见，据统计，

表 2 两组日常生活活动能力评分的对比($\bar{x}\pm s$,分)

Table 2 Comparison of activities of daily living ability scores between the two groups($\bar{x}\pm s$, scores)

Groups	Clinostatism and Turn over		Seat		Crawling and kneeling		Standing		Walking and running jump	
	Before treatment	After 3 months of treatment	Before treatment	After 3 months of treatment	Before treatment	After 3 months of treatment	Before treatment	After 3 months of treatment	Before treatment	After 3 months of treatment
Observation group (n=67)	32.68±2.54	48.63±1.19*	45.33±2.67	58.34±1.62*	31.23±1.26	39.64±1.23*	25.84±2.06	37.06±1.33*	51.37±1.65	69.82±1.68*
Control group (n=67)	32.73±2.60	42.63±1.27*	45.17±2.54	50.14±1.57*	31.19±1.30	35.84±2.02*	25.91±2.15	31.29±1.52*	51.40±2.03	58.94±1.77*
t	0.113	28.219	0.355	29.752	0.181	13.152	0.192	23.384	0.094	36.493
P	0.911	0.000	0.723	0.000	0.857	0.000	0.848	0.000	0.925	0.000

Note: compared with before treatment, *P<0.05.

该类型患儿约占 CP 患儿总数的 70%[16,17]。SCP 为一种神经运动残疾性疾病,是脑损伤所导致的原发性运动障碍,主要包含肌肉激活形式的异常、痉挛以及运动力功能的受损,并伴有肢体协调不良等症状。SCP 患儿的瘫痪形式包括双侧瘫、偏瘫以及四肢瘫等,其核心位置通常定位在患儿重心所在部位,例如腰椎、骨盆以及髋关节等。治疗该病所采取的康复训练包含维持关节活动度(Rangeofmotion, ROM)、改善肌力以及促进可动性等方法[18,19]。多项研究结果表明,肌力训练有助于提升 SCP 患儿的肌力,并利于其步态和运动功能的改善[20,21]。因此,将体育学所提出的核心稳定性概念应用到 SCP 康复治疗当中,对患儿进行 CST,可能能帮助患儿提高核心控制能力,进而促进其爬行能力以及日常生活活动能力的快速恢复。

本研究结果显示,观察组的总有效率是 95.52%,高于对照组的 85.07%,这符合刘冬芝等人[22,23]的报道结果,提示了观察组患儿应用 CST 治疗后的疗效更佳。原因可能与 CST 的作用机制有关。具体而言,核心稳定性是在人体运动过程中使骨盆以及躯干等位置肌肉保持稳定姿态,并且为上下肢活动建立支点,调节上下肢部位肌肉的激活和施力,进而确保力量的产生、传递以及控制等行为达到最佳效果。根据解剖学、生物学以及神经学相关知识和生物力学的主要作用机制分析得出,核心力量对人体能否保持躯干平衡十分重要。人体对运动的控制及稳定均是按照从近端到远端, 从面部到足部的方向依次进展,而通过研究人体躯干和四肢等位置肌肉激活时间发现,机体运动过程中,核心稳定肌最先被激活。然而 SCP 患儿却缺少此类正常激活模式,通常表现出主动类肌群和拮抗类肌群同时被激活的现象。同时,SCP 患儿躯干稳定性方面控制力普遍较低,并且腰椎结构不稳定,极易出现畸形情况。因此,脑瘫患儿核心稳定性通常较差,并且此症状易引发异常运动模式,需通过 CST 的方式进行治疗, 从而改善其肢体运动效能以及运动控制力等[24,25]。同时,本研究还发现,治疗 3 个月后两组的爬行能力评分均分别高于治疗前,且观察组高于对照组,这提示了观察组应用 CST 后,患儿的爬行能力明显提升。原因可能与 CST 的针对性作用有关。此种训练有助于患儿运动功能的正常发育,并促进其形成良好的运动爬行等姿势[26,27]。同时,患儿在训练过程中四肢、躯体和脑并用,尤其是通过不断应用大脑进行协调起到激发大脑正常发育的效果,进而可以拓展并开发患儿的脑部潜能,最终达到治疗效果。由于 SCP 患儿头颈部和上下肢等位置运动能力均与核心稳定性密切相关,因此,核心稳定有助于头颈以及上下肢顺利完成动作。SCP 患儿通过 CST 后其核心稳定性显著上升,运动支点稳定性增强,上肢伸展能力得到显著提高,并且伸展范围扩大。伴随患儿上肢伸展功能不断改进完善,同时促进其上肢有关接触、操作和释放等精细类运动的完成能力,进而提升其日常生活及活动能力。此外,本研究还发现,治疗 3 个月后两组的日常生活活动能力各项评分均分别高于治疗前,且观察组明显高于对照组,这提示了观察组的训练方式对患儿的日常生活活动能力具有较好的改善作用。原因主要是因为 CST 和传统常规康复训练相对比, 其优势在于训练更加着重于运动方面, 并且十分贴近人体的日常运动模式,有利于防止肌力不平衡现象的发生[28]。同时,该训练通过提供不稳定型支持面方式以激发患儿躯干表层和深层多种肌群参与调节反应,进而提高机体对平衡的协调反应能力以及核心肌群稳定性。此外,通过对核心肌群进行反复训练,肌肉活跃性得到有效提高,并且可以促进提升患儿脊柱稳定性,进而帮助其改善相关运动协调能力以及平衡力。这在 El-Basatiny 等人[29,30]的报道结果中也有类似的结论可以证实。

综上所述,对 SCP 患儿应用 CST 能取得较好的疗效,其可有效改善患者的爬行能力及日常生活活动能,从而可强化患儿的运动功能,值得给予推广。

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