

doi: 10.13241/j.cnki.pmb.2018.09.024

颈总动脉周围交感神经网剥脱切除术治疗学龄前脑瘫患儿的疗效 及对患儿认知状况的影响*

张晶晶 逯霞 栾新平 木依提 杜鹏[△]

(新疆医科大学第二附属医院 新疆 乌鲁木齐 830011)

摘要 目的:探讨颈总动脉周围交感神经网剥脱切除术治疗学龄前脑瘫患儿的临床效果及对患儿认知状况影响。**方法:**选取 2014 年 12 月~2016 年 12 月我院收治的学龄前脑瘫患儿 84 例,根据治疗方式的不同分为观察组与对照组,每组 42 例。对照组给予常规非手术治疗,观察组给予颈总动脉周围交感神经网剥脱切除术治疗,两组患儿均进行为期 24 周的随访观察。观察和比较两组的综合功能改善情况,治疗前后发育商、智商以及 C 因子值水平的变化。**结果:**观察组综合功能改善总有效率为 95.24%(40/42),显著高于对照组的 78.57%(33/42)($P<0.05$)。治疗后 24 周,观察组患儿的发育商值为(84.5 ± 11.3),显著高于对照组(62.2 ± 12.4)($P<0.05$);观察组患儿的智商值为(80.7 ± 11.4),显著高于对照组(67.3 ± 12.1)($P<0.05$);观察组患儿的 C 因子值为(12.8 ± 4.0),显著高于对照组(9.9 ± 3.3)($P<0.05$)。**结论:**颈总动脉周围交感神经网剥脱切除术治疗学龄前脑瘫患儿的临床效果显著,可有效改善患儿的认知状况。

关键词:交感神经切除;认知状况;脑瘫;学龄前

中图分类号:R742.3;R748 文献标识码:A 文章编号:1673-6273(2018)09-1713-04

Clinical Efficacy of Cerebral Palsy Carotid Artery Sympathetic Nerve Net Around Stripped Resection Preschool Children with Cerebral Palsy and Effect on the Cognitive Status*

ZHANG Jing-jing, LU Xia, LUAN Xin-ping, MU Yi-ti, DU Peng[△]

(Department of cerebral palsy center, Second Affiliated Hospital, Xinjiang Medical University, Urumqi, Xinjiang, 830011, China)

ABSTRACT Objective: To study the clinical efficacy of cerebral palsy carotid artery sympathetic nerve net around stripped resection preschool children with cerebral palsy and effect on the cognitive status. **Methods:** 84 cases of preschool children with cerebral palsy admitted in our hospital from December 2014 to December 2016 were selected and divided into the observation group and the control group according to different methods of treatment with 42 cases in each group. The control group was given routine non-surgical treatment, while the observation group was given common carotid artery sympathetic nerve net around stripped resection treatment. Both groups of children were followed-up for 24 weeks. The comprehensive function, developmental quotient and intelligence quotient and factor C value before and after the treatment were compared between two groups. **Results:** The total effective rate of comprehensive function was 95.24% (40/42) in the observation group, which was significantly higher than that of the control group [78.57%(33/42)]($P<0.05$). At 24 weeks after treatment, the developmental quotient value was (84.5 ± 11.3) in the observation group, which was significantly higher than that of the control group (62.2 ± 12.4) ($P<0.05$); the children's IQ was (80.7 ± 11.4) in the observation group, which was significantly higher than that of the control group (67.3 ± 12.1) ($P<0.05$); the C factor value was (12.8 ± 4.0) in the observation group, which was significantly higher than that of control group (9.9 ± 3.3) ($P<0.05$). **Conclusion:** Carotid artery sympathetic nerve net around stripped resection can effectively improve the patient's cognitive status in the treatment of preschool children with cerebral palsy.

Key words: Sympathectomy; Cognitive status; Cerebral palsy; Preschool

Chinese Library Classification(CLC): R742.3; R748 **Document code:** A

Article ID: 1673-6273(2018)09-1713-04

前言

脑瘫主要是脑组织因先天性或后天性因素导致的运动功能障碍综合征候群,临床表现为固定的非进行性损害^[1],可导致

患者的运动控制能力下降,同时促使感觉、行为、交流以及认知等一系列功能发生障碍,对患者的生存质量造成严重影响^[2]。目前,脑瘫的治疗方式包括矫形手术、脑细胞移植术以及选择性脊神经后根切断术,虽然其均能改善患者临床症状,但效果仍

* 基金项目:新疆维吾尔自治区自然科学基金项目(2013211B52)

作者简介:张晶晶(1981-),女,大学本科,主治医师,研究方向:神经外科,电话:18129215825, E-mail: yxwsxs@163.com

[△] 通讯作者:杜鹏(1981-),男,硕士,副主任医师,研究方向:脑血管病外科治疗, E-mail: 13699994376@163.com

(收稿日期:2017-07-27 接受日期:2017-08-20)

不理想,尤其是在认知状况改善方面的效果并不明显^[9]。随着医疗水平的不断进步,颈总动脉周围交感神经网剥脱切除术开始被应用于临床脑瘫患者的治疗中,且能有效改善患儿的吞咽困难、言语不清、手足徐动以及流涎等临床症状^[9]。但学龄前患儿正处于认知以及智力发育的重要阶段,颈总动脉周围交感神经网剥脱切除术是否会对患儿的认知以及智力水平产生影响尚不明确。因此,本研究主要探讨了颈总动脉周围交感神经网剥脱切除术治疗学龄前脑瘫患儿的临床效果及对患儿认知状况的影响,现将结果报道如下。

1 资料与方法

1.1 临床资料

选取我院 2014 年 12 月~2016 年 12 月收治的学龄前脑瘫患儿 84 例。其中,男 52 例,女 32 例,年龄 3~6 岁,平均年龄 4.5 ± 0.8 岁。疾病类型:共济失调 24 例,手足徐动 28 例,混合型 32 例。病因:核黄疸 30 例,新生儿窒息 18 例,早产儿 13 例,颅内出血 9 例,低体重儿 5 例,高热惊厥 6 例,其他 3 例。根据治疗方式的不同分为观察组与对照组,每组 42 例。观察组男 27 例,女 15 例,年龄 3~6 岁,平均 4.5 ± 0.9 岁。对照组男 25 例,女 17 例,年龄 3~6 岁,平均 4.5 ± 0.7 岁。两组的性别、年龄等一般临床特征比较差异均无统计学意义($P > 0.05$),具有可比性。本研究所有患儿家属均签署知情同意书且经医院伦理委员会批准。

1.2 治疗方法

对照组患儿给予常规非手术治疗。观察组给予颈总动脉周围交感神经网剥脱切除术治疗,具体方法如下:所有患儿均予以气管插管全身麻醉处理,取仰卧位,采用圆枕垫于肩胛骨之间,保证头后仰,颈前突。

1.3 观察指标

双侧切口各位于胸锁乳突肌中下 1/3 内侧缘,皮下以副肾盐水浸润,切开皮肤、皮下、纵形分离颈阔肌,切开封套筋膜,将

胸锁乳突肌牵向外,肩胛舌骨肌、胸骨甲状肌牵向内,切开颈总动脉鞘,在鞘内游离长约 6 cm 颈总动脉,充分暴露颈总动脉,注意保护颈静脉以及迷走神经^[9]。置显微镜,于镜下切口正中位置,纵行切开,并向近端及远端分别以血管钳钝性剥离颈总动脉外膜,近端直至颈总动脉分叉部,远端直至颈总动脉分叉部以下约 6 cm 位置,注意避免管壁被牵拉、重叠及剥脱过深变薄,注意保护下方组织,至可见约 6 cm 动脉表面光滑,不见丝、网状结构,停止剥脱,切除已剥离的颈总动脉外膜,间断缝合颈总动脉鞘,术后彻底止血,并进行逐层缝合。两组患儿均进行为期 24 周的随访观察。

分别对比两组患儿的综合功能改善情况,治疗前后发育商、智商以及 C 因子值情况^[9],综合功能改善情况主要是通过观察流涎、吞咽、语音、运动以及智力等方面进行评价:(1)显效:自我感觉好转,综合功能改善明显;(2)有效:综合功能部分改善,自我感觉一般;(3)无效:治疗前后综合功能无明显改善。总有效率 = 显效人数占比 + 有效人数占比。发育商判定主要是根据 Gesell 发育诊断量表进行^[9],主要包括适应行为、语言行为、个人社会行为、大运动及精细运动等,得分越高发育越好^[10]。智商测定采用中国韦氏儿童智力量表进行评价^[11],得分越高表示患者智商越高。C 因子测定同样是采用中国韦氏儿童智力量表进行评价,主要是考察患儿的记忆以及注意力因素,得分越高表示患儿认知状况越好。

1.4 统计学方法

本研究数据使用 SPSS20.0 软件进行统计学分析,计数资料予以 χ^2 检验,计量资料采用 t 检验,以 $P < 0.05$ 为差异具有统计学意义。

2 结果

2.1 两组患儿综合功能改善情况的对比

观察组患儿综合功能改善总有效率为 95.24%(40/42),显著高于对照组[78.57%(33/42)]($P < 0.05$),见表 1。

表 1 两组综合功能改善情况的对比(例,%)

Table 1 Comparison of the improvement of comprehensive function between the two groups(n,%)

Group	Case	Markedly effective	Effective	Invalid	Total efficacy
Observation group	42	18(42.86)	22(52.38)	2(4.76)	40(95.24)
Control group	42	15(35.71)	18(42.86)	9(21.43)	33(78.57)
P		0.503	0.382	0.024	0.024

2.2 两组患儿治疗前后发育商值的比较

治疗后 24 周,观察组患儿的发育商值为(84.5 ± 11.3),显著

高于对照组的(62.2 ± 12.4)($P < 0.05$),见表 2。

表 2 两组治疗前后发育商值的比较($\bar{x} \pm s$)

Table 2 Comparison of the developmental quotient between the two groups before and after treatment($\bar{x} \pm s$)

Group	Case	Before treatment	At 24 weeks after treatment
Observation group	42	52.4 ± 6.0	84.5 ± 11.3
Control group	42	52.8 ± 6.1	62.2 ± 12.4
P	-	0.763	0.000

2.3 两组患儿治疗前后智商值比较

治疗后 24 周,观察组患儿的智商值为(80.7 ± 11.4),显著高

于对照组的(67.3 ± 12.1)($P < 0.05$),见表 3。

表 3 两组患儿治疗前后智商值比较($\bar{x} \pm s$)Table 3 Comparison of IQ values between two groups before and after treatment($\bar{x} \pm s$)

Group	Case	Before treatment	At 24 weeks after treatment
Observation group	42	59.2 $\pm$ 4.5	80.7 $\pm$ 11.4
Control group	42	59.7 $\pm$ 4.4	67.3 $\pm$ 12.1
P	-	0.608	0.000

2.4 两组患儿治疗前后 C 因子值比较

高于对照组的(9.9 $\pm$ 3.3) (P<0.05),见表 4。治疗后 24 周,观察组患儿的 C 因子值为(12.8 $\pm$ 4.0),显著表 4 两组患儿治疗前后 C 因子值比较(例, $\bar{x} \pm s$)Table 4 Comparison of the C factor value between two groups before and after treatment(n, $\bar{x} \pm s$)

Group	Case	Before treatment	At 24 weeks after treatment
Observation group	42	8.9 $\pm$ 2.4	12.8 $\pm$ 4.0
Control group	42	9.0 $\pm$ 2.5	9.9 $\pm$ 3.3
P	-	0.852	0.001

3 讨论

大脑的血流灌注量不足是导致脑瘫患儿出现肢体功能障碍、智力发育障碍以及姿势异常等症状的主要原因^[12]。由于损伤的严重程度及部位存在一定差异,脑瘫患者其临床表现也不尽相同,但脑组织缺氧以及脑血流障碍是不同类型脑瘫的共同病理基础^[13]。近年来,全球范围内脑瘫的发生率约为 1%,患者数量较为庞大,严重影响了儿童的身心健康,寻找有效的治疗手段显得尤为重要。

本研究结果显示观察组患儿综合功能改善总有效率为 95.24%(40/42),显著高于对照组的 78.57%(33/42),说明此手术疗法对学龄前脑瘫患儿的果显著^[14]。其主要原因可能在于颈总动脉除了自身管壁结构外,其舒张和收缩主要是受交感神经支配,而交感神经主要是以网状的结构分布与颈总动脉和颈内动脉外膜中,在外膜交感神经网切除后会导致血管扩张,从而增加了血流量,进一步改善脑组织的微循环缺血状态^[15],同时对侧支循环的建立也起到了一定的促进作用,最终促进了处于临界状态的脑细胞功能得到较好的恢复^[16,17]。人类脑血流量的供应主要依赖双侧颈动脉,但其周围具有丰富的交感神经纤维限制了颈动静脉的扩张收缩^[18]。颈总动脉周围交感神经网剥脱切除术能够切断动静脉之间的末梢神经,神经反射传导功能失调能够增强血管反应性^[19]。因此,副交感神经兴奋性增强促使了脑血流量增加,也促发邻近神经元细胞活跃度增加,改善了脑组织的功能^[20]。颈总动脉周围的网状外膜层较为疏松,有利于剥离,从而有效避免了对周围组织造成损害,保证了血管壁的稳固性,具有较好的安全性^[21-23]。

此外,观察组治疗后 24 周各项值均显著高于对照组,提示颈总动脉周围交感神经网剥脱切除术并不能在短期内给脑瘫患儿的认知水平带来改善作用,但长期的认知状态改善效果显著。颈总动脉周围交感神经网剥脱切除术可有效切断动静脉之间的末梢神经,促使神经发射传导功能失调,增强血管反应,随着副交感神经兴奋性的增强脑血流量增加,增强了部分临近的神经元细胞活性,达到改善脑组织功能的目的^[24-26]。本研究结果提示了颈总动脉周围交感神经网剥脱切除术对患儿认知水

平的改善可能伴随着患儿的生长发育过程。而学龄前儿童正处于认知水平飞速发展的阶段,与正常发育的儿童相比,脑瘫患儿认知水平的发展一般是迟滞的^[27],手术治疗会有效改善对患儿今后的生长发育,无疑具有极大的临床价值^[28],因此本治疗术式对其认知状态的改善具有积极意义。另有研究报道认为^[29,30]颈总动脉周围交感神经网剥脱切除术具有一定程度的短期不良作用,会导致患儿出现脑组织高灌注状态,从而引发头痛、癫痫以及其他严重并发症的发生。因此,在对患儿进行手术治疗前应仔细评估病情,并根据患儿的具体情况可在手术前后采用 TCD 检查,及时明确脑血流变化情况,一旦发生高灌注情况立即予以血压控制、脱水等对症治疗。

综上所述,颈总动脉周围交感神经网剥脱切除术治疗学龄前脑瘫患儿的临床效果显著,可有效改善患儿的认知状况。

参考文献(References)

- [1] 张菲. 不同类型脑瘫患儿的社会生活能力及其相关因素研究[J]. 中国妇幼保健, 2016, 31(3): 523-524
Zhang Fei. Study on the social life ability of children with different types of cerebral palsy and its related factors [J]. Maternal and Child Health Care of China, 2016, 31(3): 523-524
- [2] 杨秋菊, 袁婉欢, 黄惠君. 个体化护理干预对血管性痴呆患者康复效果的影响[J]. 吉林医学, 2013, (19): 143-144
Yang Qiu-ju, Yuan Wan-huan, Huang Hui-jun. Effect of individualized nursing intervention on rehabilitation of patients with vascular dementia [J]. Jilin Medical University, 2013, (19): 143-144
- [3] 李彬, 闫宝锋, 木依提·阿不里米提, 等. 颈动脉交感神经网切除术对脑性瘫痪患儿吞咽障碍及流涎的改善作用[J]. 山东医药, 2016, 56(45): 70-72
Li Bin, Yan Bao-feng, Muyitio Abulimiti, et al. Carotid artery sympathetic nerve net resection of cerebral palsy in children with dysphagia and ptialism improvement [J]. Shandong Medical Journal, 2016, 56(45): 70-72
- [4] 刘志刚, 李华, 李泽, 等. 颈总动脉周围交感神经网剥脱切除术联合 Bobath 法康复训练治疗 3~6 岁脑瘫患儿的临床效果观察[J]. 医学临床研究, 2017, 34(3): 450-452
Liu Zhi-gang, Li Hua, Li Ze, et al. Clinical observation of Carotid

- Sympathectomy and Bobath rehabilitation training for 3~6 year old children with cerebral palsy[J]. Journal of Clinical Research, 2017, 34 (3): 450-452
- [5] 汤可,周敬安,赵亚群,等. 经枕髁入路显露颈静脉结节的虚拟现实手术解剖研究[J].神经疾病与精神卫生, 2014, 14(6): 551-553
Tang Ke, Zhou Jing-an, Zhao Ya-qun, et al. Virtual reality study of surgical anatomy of the jugular vein nodules through the occipital condyle approach [J]. Journal of Neuroscience and Mental Health, 2014, 14(6): 551-553
- [6] 张智,朱明海,毕军花,等.患肢畸形矫正术或颈总动脉周围交感神经网剥脱术对混合型脑瘫肌张力和运动功能的影响[J].中国实用神经疾病杂志, 2014, 17(13): 76-77
Zhang Zhi, Zhu Ming-hai, Bi Jun-hua, et al. After distal limb deformity or carotid artery dissection around the sympathetic nerve net effect on tension and muscle movement of cerebral palsy hybrid [J]. Chinese Journal of Practical Nervous Diseases, 2014, 17(13): 76-77
- [7] 李爱民,炎冰,张黎,等.颈动脉外膜交感神经切除术在神经外科的应用[J].中华神经外科疾病研究杂志, 2012, 11(3): 278-280
Li Ai-min, Yan Bing, Zhang Li, et al. Carotid Sympathectomy for the application [J]. Chinese Journal of Neurosurgical Disease Research, 2012, 11(3): 278-280
- [8] 万鸽.上肢作业治疗在婴幼儿偏瘫型脑瘫中的临床疗效分析[J].中国实用医药, 2015, (03): 249-250
Wan Ge. Clinical analysis of upper limb surgery in infants with hemiplegic cerebral palsy[J]. China Practical Medical, 2015, (03): 249-250
- [9] 宋彩虹,刘俐,张明,等.MRI 结合 Gesell 测试对足月新生儿 HIE 预后判断的研究[J].中国妇幼保健研究, 2016, 27(5): 564-567+573
Song Cai-hong, Liu Li, Zhang Ming, et al. MRI combined with Gesell test to estimate prognosis of HIE in full-term neonates [J]. Chinese Journal of Woman and Child Health Research, 2016, 27 (5): 564-567+573
- [10] 康瑞华,常建洛,高琦.家庭康复护理对脑瘫患儿的意义及实施要点探析[J].当代医学, 2015, 21(15): 99-100
Kang Rui-hua, Chang Jian-luo, Gao Qi. Significance and implementation of family rehabilitation nursing for children with cerebral palsy [J]. Contemporary medicine, 2015, 21(15): 99-100
- [11] 谭柏坚,郭德纯,杨惠青.学习困难儿童认知特点的对照研究[J].中国当代医药, 2014, 21(21): 23-25
Tan Bai-jian, Wu De-chun, Yang Hui-qing. Comparative study of cognitive characteristics in children with learning disabilities [J]. Chinese contemporary medicine, 2014, 21(21): 23-25
- [12] 买尔阿芭,哈尼帕,栗新平,等.混合型脑瘫患儿颈总动脉交感神经网剥脱术前后脑电图改变[J].新疆医学, 2016, 46(2): 178-179
Mai Era-ba, Ha Ni-pa, Luan Xin-ping, et al. Mixed type cerebral palsy of common carotid artery sympathetic nerve net stripping surgery before and after the change of EEG [J]. Xinjiang Medical Journal, 2016, 46(2): 178-179
- [13] 罗志宏,王丽岩,魏洪妍,等.高压氧联合功能训练对脑瘫患儿运动功能的影响[J].中国现代医生, 2015, 23(2): 65-67
Luo Zhi-hong, Wang Li-yan, Wei Hong-yan, et al. Effect of hyperbaric oxygen combined functional training on motor function in children with cerebral palsy[J]. Chinese modern doctor, 2015, 23(2): 65-67
- [14] 王利江,纪静丽,温淑静,等.脑性瘫痪患儿流涎的评估和治疗研究进展[J].中国康复理论与实践, 2016, 22(3): 299-302
- Wang Li-jiang, Ji Li-jing, Wen Shu-jing, et al. Study on the evaluation and treatment of cerebral palsy in children with salivation [J]. Chinese Journal of Rehabilitation Theory and Practice, 2016, 22(3): 299-302
- [15] 秦泗河,葛建忠,陈建文.1090 例脑性瘫痪外科手术治疗统计分析[J].中国骨与关节外科, 2011, 04(5): 374-379
Qin Si-he, Ge Jian-zhong, Chen Jian-wen. Statistical analysis of surgical treatment for 1090 cases of cerebral palsy [J]. Chinese Journal Bone and Joint Surgery, 2011, 04(5): 374-379
- [16] 朱光辉,梅海波,赫荣国,等.股骨远端截骨和髌腱止点远端移位联合手术治疗儿童脑瘫屈膝步态的近期效果评价[J].中华小儿外科杂志, 2016, 37(10): 785-789
Zhu Guang-hui, Mei Hai-bo, He Rong-guo, et al. Recent evaluation of the effect of distal femoral osteotomy and distal patellar tendon shift on the knee flexion gait in children with cerebral palsy [J]. Chinese Journal of Pediatric Surgery, 2016, 37(10): 785-789
- [17] 张士忠,张明然,崔鹏,等.永久性闭塞患侧颈内动脉治疗巨大颅内动脉瘤[J].泰山医学院学报, 2015, 36(8): 863-866
Zhang Shi-zhong, Zhang Ming-ran, Cui Peng, et al. Permanent occlusion of the internal carotid artery in the treatment of giant intracranial aneurysms [J]. Journal of Taishan Medical College, 2015, 36 (8): 863-866
- [18] 刘超,李松柏.应用磁共振全脑动脉自旋标记灌注成像对颈动脉狭窄内膜剥脱术疗效的评价[J].影像诊断与介入放射学, 2016, 25(5): 368-372
Liu Chao, Li Song-bai. Evaluation of carotid spin endarterectomy using magnetic resonance whole brain arterial spin labeled perfusion imaging [J]. Diagnostic Imaging & Interventional Radiology, 2016, 25(5): 368-372
- [19] 赵家鹏,王家勤,常崇旺,等.颈总动脉周围交感神经网剥脱切除术治疗脑性瘫痪患儿的效果及其认知功能的影响[J].中华实用儿科临床杂志, 2015, 30(19): 1509-1511
Zhao Jia-peng, Wang Jia-qin, Chang Chong-wang, et al. The effect of Carotid Sympathectomy on the treatment of children with cerebral palsy and its cognitive function [J]. Journal of Applied Clinical Pediatrics, 2015, 30(19): 1509-1511
- [20] 吴韵.星状神经节阻滞治疗脑血管痉挛的研究进展[J].赣南医学院学报, 2016, 36(4): 516-518
Wu Yun. Progress of stellate ganglion block in the treatment of cerebral vasospasm [J]. Journal of Gannan Medical University, 2016, 36 (4): 516-518
- [21] 闫宝锋,李彬,木依提·阿不里米提,等.颈总动脉交感神经网剥脱术对手足徐动型脑瘫患儿运动功能的影响[J].中国实用神经疾病杂志, 2017, 20(6): 32-34
Yan Bao-feng, Li Bin, Muyiti·A Bulimiti, et al. Effect of carotid sympathetic nerve network stripping on motor function in children with cerebral palsy caused by hand foot movement [J]. Chinese Journal of Practical Nervous Diseases, 2017, 20(6): 32-34
- [22] 张帅帅,李亮,毕龙,等.显微外科技术构建家兔股动脉局部去交感神经模型[J].中华显微外科杂志, 2016, 39(1): 46-51
Zhang Shuai-shuai, Li Liang, Bi Long, et al. Establishment of local sympathetic denervation model of rabbit femoral artery by microsurgical technique [J]. Chinese Journal of Microsurgery, 2016, 39(1): 46-51

- [16] Basraon S K, Mele L, Myatt L, et al. Relationship of Early Pregnancy Waist-to-Hip Ratio versus Body Mass Index with Gestational Diabetes Mellitus and Insulin Resistance[J]. American Journal of Perinatology, 2016, 33(1):114-121
- [17] Ainuddin J, Karim N, Hasan A A, et al. Metformin versus insulin treatment in gestational diabetes in pregnancy in a developing country. A randomized control trial[J]. Diabetes Research & Clinical Practice, 2015, 107(2): 290-299
- [18] Moazzen H, Lu X, Liu M, et al. Pregestational Diabetes Induces Fetal Coronary Artery Malformation via Reactive Oxygen Species Signaling[J]. Diabetes, 2015, 64(4): 1431-1443
- [19] Abuhejja A T, Albash M, Mathew M. Gestational and Pregestational Diabetes Mellitus in Omani Women: Comparison of obstetric and perinatal outcomes [J]. Sultan Qaboos University Medical Journal, 2015, 15(4): e496-e500
- [20] Panpitpat P, Thipaporn T, Somprasit C, et al. The effects of systematic management on maternal and neonatal complications in gestational diabetes subjects [J]. Journal of the Medical Association of Thailand, 2015, 98(5): 451-456
- [21] Mirzamoradi M, Bakhtiyari M, Kimiaee P, et al. Investigating the effects of treatment based on single high blood glucose in gestational diabetes screening on maternal and neonatal complications [J]. Archives of Gynecology & Obstetrics, 2015, 292(3): 687-695
- [22] Köhler M, Ziegler A G, Beyerlein A. Development of a simple tool to predict the risk of postpartum diabetes in women with gestational diabetes mellitus[J]. Acta Diabetologica, 2016, 53(3): 433-437
- [23] Gupta M, Thalquatra M, Rao P. P3 Fraction: Effect on HbA1c Values by HPLC[J]. Journal of Clinical & Diagnostic Research Jcdr, 2016, 10 (9): BC12BC14
- [24] Oldroyd J, O'Neil A, Hare D L. Can patients presenting with acute coronary syndrome be screened for diabetes using glycosylated haemoglobin? [J]. Medical Journal of Australia, 2015, 203 (10): 401-405
- [25] Abdulazeez S, Borgio J F. In-Silico Computing of the Most Deleterious nsSNPs in HBA1 Gene[J]. Plos One, 2016, 11(1): e0147702
- [26] Editor-In-Chief Z B, Editor-In-Chief G N. Self-monitoring of blood glucose for type 2 diabetes [J]. Journal of Diabetes, 2015, 7 (5): 593-594
- [27] Andrews M, Soto N, Arredondo-Olgún M. Association between ferritin and hepcidin levels and inflammatory status in patients with type 2 diabetes mellitus and obesity[J]. Nutrition, 2015, 31(1): 51-57
- [28] Cardoso C R L, Leite N C, Ferreira M T, et al. Prognostic importance of baseline and serial glycated hemoglobin levels in high-risk patients with type 2 diabetes: the Rio de Janeiro Type 2 Diabetes Cohort Study [J]. Acta Diabetologica, 2015, 52(1): 21-29
- [29] Suckling R J, He F J, Markandu N D, et al. Modest Salt Reduction Lowers Blood Pressure and Albumin Excretion in Impaired Glucose Tolerance and Type 2 Diabetes Mellitus: A Randomized Double-Blind Trial[J]. Hypertension, 2016, 67(6): 1189-1195
- [30] Bowers K A, Olsen S F, Bao W, et al. Plasma Concentrations of Ferritin in Early Pregnancy Are Associated with Risk of Gestational Diabetes Mellitus in Women in the Danish National Birth Cohort [J]. Journal of Nutrition, 2016, 146(9): 1756-1761

(上接第 1716 页)

- [23] 王子亮,许岗勤,汪勇锋,等.经桡动脉途径采用 6F 指引导管行颈动脉支架成形术的可行性及安全性[J].中华放射学杂志, 2016, 50(9): 682-685
Wang Zi-liang, Xu Gang-qin, Wang Yong-feng, et al. Feasibility and safety of carotid stent angioplasty using 6F guided catheter via radial artery[J]. Chinese Journal of Radiology, 2016, 50(9): 682-685
- [24] 黄磊,匡锋,单忠贵,等.合并颈动脉狭窄的冠状动脉搭桥发生围手术期缺血性脑卒中的常见因素分析 [J]. 中南大学学报 (医学版), 2016, 41(12): 1340-1344
Huang Lei, Kuang Feng, Shan Zhong-gui, et al. Analysis of common factors of perioperative ischemic stroke complicated by carotid artery stenosis in patients with coronary artery bypass grafting[J]. Journal of Central South University(Medical Science): 2016, 41(12): 1340-1344
- [25] 闫宝锋,逯霞,苗伟,等.颈总动脉交感神经剥脱术后脑瘫患儿脑电图及 TCD 监测指标改变的意义[J].新疆医科大学学报,2016,39 (4): 489-491
Yan Bao-feng, Lu Xia, Miao Wei, et al. Significance of changes of electroencephalogram and TCD monitoring indexes in children with cerebral palsy after sympathetic nerve net stripping of common carotid artery[J]. Journal of Xinjiang Medical University, 2016, 39(4): 489-491
- [26] 时国兵. 标准大骨瓣开颅减压手术对重型颅脑损伤患者脑代谢能力的影响[J].中国医药导报, 2013, 10(23): 75-76
Shi Guo-bing. Effect of standard large craniotomy craniotomy on cerebral metabolic capacity in patients with severe craniocerebral injury [J]. China Medical Herald, 2013, 10(23): 75-76
- [27] 梁秋叶,覃花桃.影响脑瘫儿童延续家庭康复依从性的因素分析[J].医学理论与实践, 2015, 28(15): 1969-1970
Liang Qiu-ye, Qin Hua-tao. Analysis of factors influencing compliance of family rehabilitation for children with cerebral palsy [J]. Medical theory and practice, 2015, 28(15): 1969-1970
- [28] 于江龙,买尔阿芭,木塔力甫·努热合买提,等.颈总动脉周围交感神经剥脱切除术对学龄前脑瘫患儿头部血供及认知情况的影响[J].中华神经外科杂志, 2015, 31(3): 277-280
Yu Jiang-long, Mai Era-ba, Mutalipu ·Nurehemaiti, et al. Effect of Carotid Sympathectomy on the head blood supply and cognitive status in preschool children with cerebral palsy [J]. Chinese Journal of surgery, 2015, 31(3): 277-280
- [29] Van Rooijen M, Verhoeven L, Steenbergen B. Early numeracy in cerebral palsy: review and future research[J]. Dev Med Child Neurol, 2011, 53(9): 202-209
- [30] Vall Rooijen M, Verhoeven L, Smits DW, et al. Arithmetic performance of children with cerebral palsy: the influence of cognitive and motor factors[J]. Res Dev Disabil, 2012, 33(2): 530-537