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加速康复外科理念辅助治疗小婴儿先天性巨结肠的有效性和安全性研究 *

张建军¹ 刘丰丽^{1Δ} 唐维兵² 马同胜¹ 曾战东¹ 赵腾飞¹

(1 徐州市儿童医院 新生儿外科 江苏 徐州 221000; 2 南京医科大学附属儿童医院 新生儿外科 江苏 南京 210029)

摘要 目的:探讨加速康复外科(Enhanced recovery after surgery, ERAS)理念用于治疗小婴儿先天性巨结肠(Hirschsprung's, HSCR)的临床疗效和安全性。**方法:**选择 2016 年 01 月至 2017 年 12 月在我院新生儿外科接受手术治疗并临床病理确诊的 79 例 HSCR 患儿并将其分为对照组和 ERAS 组。对照组 26 例给予经腹巨结肠根治术, ERAS 组 44 例入院后据患儿病情进行宣教 ERAS, 再采用腹腔镜巨结肠根治术。比较两组手术时间、术后肠功能恢复时间、留置管道情况、平均住院日、住院费用、血清 C 反应蛋白(C-reactive protein, CRP)、降钙素原、白介素-6(Interleukin, IL-6)、皮质醇水平的变化及围手术期并发症的发生情况。**结果:**ERAS 组手术时间、术中出血量、肠功能恢复时间、术前平均住院天数、术后平均住院天数、平均住院天数、平均费用、留置胃管时间、留置尿管时间均显著短于对照组。术后, ERAS 组血清 CRP、降钙素原、IL-6、皮质醇水平均明显低于对照组。ERAS 组术中并发症发生率显著低于对照组(2.27% vs. 23.08, $P < 0.05$)。**结论:**加速康复外科理念辅助治疗小婴儿先天性巨结肠可促进患者术后病情恢复, 减少患者医疗费用并提高治疗安全性。

关键词:加速康复外科; 腹腔镜; 先天性巨结肠

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Efficacy and Safety of Accelerated Rehabilitation Surgery in the Treatment of Hirschsprung's Disease in Infants*

ZHANG Jian-jun¹, LIU Feng-li^{1Δ}, TANG Wei-bing², MA Tong-sheng¹, ZENG Zhan-dong¹, ZHAO Teng-fei¹

(1 Department of neonatal surgery, Xuzhou Children's Hospital, Xuzhou, Jiangsu, 221000, China;

2 Department of neonatal surgery, Children's Hospital Affiliated to Nanjing Medical University, Nanjing, Jiangsu, 210029, China)

ABSTRACT Objective: To investigate the clinical efficacy and safety of concept of accelerated recovery after surgery (ERAS) in the treatment of Hirschsprung's (HSCR) infants. **Methods:** From January 2016 to December 2017, 79 cases of infants with HSCR who underwent surgical treatment and diagnosed by the clinical pathology in our hospital were selected and divided into the control group and the ERAS group. In the control group, 26 patients underwent radical operation of abdominal megacolon, 44 patients in the ERAS group were enrolled in the hospital under the condition of ERAS, and then treated by laparoscopic megacolon radical surgery. The operation time, postoperative intestinal function recovery time, indwelling catheter status, average hospitalization stay, hospitalization cost, the changes of serum C-reactive protein (CRP), procalcitonin, interleukin (IL-6) and cortisol levels as well as the incidence of perioperative complications were compared between the two groups. **Results:** The operation time, intraoperative blood loss, intestinal function recovery time, average hospital stay, average postoperative hospital stay, average cost, indwelling gastric tube time, and indwelling catheter time were significantly lower or shorter in the ERAS group than those in the control group ($P < 0.05$). After operation, the levels of serum CRP, procalcitonin, IL-6 and cortisol in the ERAS group were significantly lower than those in the control group ($P < 0.05$). The incidence of intraoperative complications in the ERAS group was significantly lower than that in the control group (2.27% vs. 23.08, $P < 0.05$). **Conclusion:** Accelerated rehabilitation surgery concept can promote the recovery of congenital megacolon in THE infants after surgery, reduce the medical expenses and improve the safety of treatment.

Key words: Accelerated rehabilitation surgery; Laparoscopy; Hirschsprung's

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前言

先天性巨结肠^[1-3](Hirschsprung's disease)又称为肠管无神经

节细胞症(Aganglionosis), 症状表现为远端结肠或者直肠不能有效排便, 造成结肠肠道适应性肥大, 其主要发病机制是因为缺乏肠管神经节的有效调控, 属于婴幼儿先天性疾病中的常见

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作者简介: 张建军(1983-)男, 硕士研究生, 主治医师, 研究方向: 先天性巨结肠及其它肛肠疾病, 电话: 18796286361

Δ 通讯作者: 刘丰丽(1964-)女, 本科, 主任医师, 研究方向: 先天性消化道畸形及儿童营养, E-mail: yinmin0006@163.com

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病。经肛门 Soave 术是近年来治疗先天性巨结肠的常用术式,但因手术入路的问题,观察腹腔内情况及处理长段型巨结肠等方面存在一定的局限。

Henrik Kehlet 教授于 1990 年提出“Fast Track”^[45](加速康复)概念。加速康复外科(fast-track surgery, FTS)又可译为(Enhanced recovery after surgery, ERAS^[69]),随着生物-心理-社会医学模式的提出和应用,ERAS 已逐渐成为热点话题,其重在强调康复质量,而不仅仅是速度,是指在围手术期采用一系列优化措施减少应激和并发症,加快患者术后康复。本研究我院从 2016 年 10 月~2017 年 10 月将加速康复外科理念用于腹腔镜巨结肠根治术治疗小婴儿先天性巨结肠,探讨了其临床疗效和安全性。

表 1 两组患者一般资料的比较

Table 1 Comparison of the general data between two groups of patients

Type		Control group (n=26)	ERAS group (n=44)
Common type	Male	11	32
	Female	2	8
Long segment type	Male	3	1
	Female	5	3
Total colonic type	Male	4	0
	Female	1	0

1.2 围手术期处理

1.2.1 ERAS 组 术前 5-7 天至术晨清洁回流灌肠。术前 4 h 禁饮奶,术前 2 h 以 15 mL/Kg 饮用温 5%葡萄糖液。麻醉镇静后、气管插管前留置胃管。向患儿家属宣教 ERAS 细则。

1.2.2 对照组 入院前正规扩肛至 12 号扩肛器。术前 3-5 天至术晨清洁回流灌肠,同时行造瘘口回流灌肠。术前 6 小时禁饮奶,4 小时禁饮水。胃管留置同 ERAS 组。

1.3 术中处理

1.3.1 ERAS 组 全程术中保温。温碘伏棉球消毒。术中控制液体量及速度:第 1 小时 15 mL/kg,之后 8 mL/kg。腹腔镜辅助改良 Soave's 根治术。不常规置留腹腔引流管及尿管。

1.3.2 对照组 全程术中保温。常规消毒手术区。不强调控制术中液体量及速度。经腹改良 Soave's 根治术。常规保留尿管。不常规置留腹腔引流管。

1.4 术后处理

1.4.1 ERAS 组 术后 24h 内拔除鼻胃管及导尿管,予以 10mL/2 h 5%温葡萄糖液口服;术后第 2 日口服奶 10-15 mL/2 h,至术后第 4 天停止输注营养液。护士按 ERAS 术后内容监督家属怀抱患儿及增加躯体运动以促进肠功能恢复。术后安慰奶嘴吸允,同时应用我院麻醉科自配镇痛泵镇痛处理(持续泵入 24 小时)。术后常规保暖。ERAS 相关方案至术后 6 月结束。

1.4.2 对照组 术后根据患儿肠功能恢复情况制定拔除鼻胃管及导尿管时间,3-5 天不等拔除。拔除后按 ERAS 术后喂养方案处理。术后怀抱及躯体运动与鼻胃管拔除时间同步。术后镇痛同 ERAS 组。

1.5 出院标准

1 资料与方法

1.1 一般资料

选择徐州市儿童医院新生儿外科 2016 年 01 月至 2017 年 12 月收治的病理确诊的 HSCR 患儿 70 例,并将其分为对照组和 ERAS 组。对照组 26 例给予经腹巨结肠根治术,包括全结肠型 2 例行升结肠-回肠“J”储袋吻合后回肠肛管吻合术;3 例回肠肛管吻合术。ERAS 组 44 例入院后据患儿病情进行宣教 ERAS,再采用腹腔镜巨结肠根治术。在徐州市儿童医院的协助下,经伦理委员会审批、家属知情同意并签署知情同意书后展开研究。本研究排除了经一期巨结肠根治术治疗的患儿,两组一般临床资料比较差异均无统计学意义($P>0.05$),具有可比性。

完全按生理需要量经口喂养,无腹胀、腹泻等症状,肛门排气无明显异常,取得患儿家属同意出院。ERAS 组无术后并发症者术后 1 周出院,待术后 2 周来院指导正规扩肛治疗。对照组腹部切口拆线,一般 10-14 天出院。

1.6 研究指标

手术时间、术中出血量、术后肠功能恢复时间、术后并发症、住院时间、住院费用。鼻胃管、尿管留置时间。2)采用酶联免疫吸附法检测两组患者手术前后的血清的 CRP、IL-6;采用荧光定量法检测降钙素原、采用放射免疫测定皮质醇含量。3)手术期间并发症的发生情况。

1.7 统计学分析

应用 SPSS18.0 统计软件对数据进行分析,计量资料组间比较采用 t 检验,计数资料组间比较采用卡方检验,以 $P<0.05$ 为差异具有统计学意义。

2 结果

2.1 两组手术指标的比较

ERAS 组手术时间、术中出血量、肠功能恢复时间、术前平均住院天数、术后平均住院天数、平均住院天数、平均费用、留置胃管时间、留置尿管时间均短于对照组,差异有统计学意义($P<0.05$)。

2.2 两组手术前后应激指标比较

术前,两组血清 CRP、降钙素原、IL-6、皮质醇水平比较差异均无统计学意义($P>0.05$),术后,ERAS 组血清 CRP、降钙素原、IL-6、皮质醇水平均显著低于对照组,差异有统计学意义($P<0.05$)。

表 2 两组手术指标比较

Table 2 Comparison of the surgical indicators between two groups of patients

Surgical indexes	Control group(n=26)	ERAS group(n=44)	P
Operation time(min)	114.6± 1.4	91.9± 2.5	0.039
Intraoperative bleeding(mL)	24.2± 0.9	5.9± 0.3	0.042
Recovery time of intestinal function(h)	42.4± 0.9	41.0± 0.7	0.239
Preoperative hospitalization days (d)	3.1± 0.3	6.9± 0.3	0.035
Postoperative hospital days (d)	16.9± 2.9	8.1± 0.3	0.018
Average days of hospitalization (d)	20.0± 2.8	15.1± 0.4	0.025
Average cost (yuan)	32340± 402.5	25510± 166.4	0.027
Indwelling gastric tube time (h)	62.1± 0.8	20.7± 0.2	0.019
Indwelling catheter time (h)	61.1± 0.8	19.7± 0.2	0.019

表 3 两组手术前后应激指标比较

Table 3 Comparison of the stress indicators between two groups of patients before and after surgery

		CRP	Calcitonin	IL-6	Cortisol
Preoperation (P1)	Control group	5.3± 0.2	0.2± 0.02	5.7± 0.3	528± 17.4
	ERAS group	5.2± 0.1	0.2± 0.01	4.6± 0.3	509± 17.5
At 24 hours after operation (P2)	Control group	53.4± 2.0	28.6± 1.4	22± 1.5	1066± 37.1
	ERAS group	27.4± 1.8	9.3± 0.7	8.8± 0.4	750± 16.5
At 72 hours after operation (P3)	Control group	9.0± 0.3	4.3± 2.2	8.4± 0.5	738± 20.4
	ERAS group	6.3± 0.2	0.6± 0.1	6.0± 0.2	573.6± 9.6
P1		0.284	0.862	0.058	0.487
P2		0.031	0.017	0.016	0.015
P3		0.043	0.027	0.057	0.054

2.3 两组围手术期并发症发生情况的比较

对照组手术期间发生 6 例并发症,ERAS 出现 1 例并发

症,ERAS 组并发症的发生率明显低于对照组,差异有统计学意义($P<0.05$)。

表 4 两组围手术期并发症发生情况的比较

Table 4 Comparison of the incidence of perioperative complications between two groups

Groups	n	Number of complications	Incidence rate(%)
Control group	26	6	23.08
ERAS group	44	1	2.27*

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

3 讨论

FTS 能够实现对围手术期的全过程进行综合调控^[10-13],运用多种治疗手段和护理方式保障患者的术后康复进程,降低患者术后应激反应水平,加快恢复进程^[14]。随着循证医学的发展,人们对于疾病的发病机理以及病人围手术期治疗过程的研究越来越深入,人们发现传统治疗模式已经不能满足现代医学的要求^[15]。FTS 旨在综合运用各种治疗手段对疾病进行治疗,不仅可以提高疾病治疗的成功率,还可以加快术后康复进程,实现医疗资源的高效利用^[16-18]。

早在上世纪七十年代,“Fast track”的概念就已产生,而现

在所说的 FTS 就是由其逐步发展而来,当时“Fast track”只是为急诊患者设立的急诊通道,用于突发性疾病的快速治疗以及康复,现在国内医院普遍存在的绿色通道就是从其发展而来的。当发展到二十世纪九十年代时,传统的疾病治疗模式已经满足围手术期的一系列要求,FTS 的概念因此逐步走上历史舞台,越来越被广大的医护人员以及医学专家所接受,并应用到了心脏病患者的术后插管拔除中去,这使得患者的康复进程得以加快。直到 2001 年,Wilmore 和 Kehlet 将快速康复外科正式命名为“Fast track surgery”^[19]。在 FTS 的概念被正式提出之后,其得到了欧美医学领域的广泛关注,并逐渐应用到各种医学领域中^[20]。2006 年,Wind 等人^[5]以快速康复结肠外科方案为基础,详尽

的阐述了 FTS 的基本内容,这对于 FTS 的广泛推广具有历史意义。

FTS 在国内起步较晚,目前还处于探索阶段,国内有关 FTS 最早的研究报道还要追溯到 2006 年^[21]。总的来说,FTS 就是综合运用各种医疗手段减少患者应激反应、促进术后康复进程的综合治疗方案^[21,22]。不同于传统的治疗手段,FTS 通过运用止疼方法、麻醉方法、外科微创等先进的治疗手段,与传统的医护方式相结合,取长补短,相辅相成,从而形成完备的治疗体系^[7]。FTS 不只是追求缩短治疗周期,更是以提高治疗效果、改善术后康复为治疗宗旨,随着患者康复进程的加快,术后并发症以及死亡率显著下降,医疗费用支出明显减少。

随着全局性围手术期这一新概念的发展,在外科医生、康复师、麻醉师、护士、病人及家属的共同努力下,FTS 得到了快速发展。现代循证医学的证明 FTS 确实存在其独到之处,是现代外科不可或缺的先进治疗模式^[24]。Ansari 等^[25]专家学者对于 FTS 的前景给予了高度肯定,他们认为 FTS 是现代医学理念顺应时代发展的产物,可以拓展到整个外科领域,用于各种外科疾病的治疗。FTS 的终极目标是实现手术的无痛无风险,通过运用各种治疗手段,对围手术期各个环节进行实时监控,使患者在接受治疗的全过程中获得最优的治疗效果、承受最低的医疗风险,通过下调自身应激,加快患者术后康复进程。

虽然 FTS 取得了广泛的关注也得到了循证医学的理论支持,但是在其发展进程中也遇到了许多挑战,这也是现在限制 FTS 广泛应用的问题所在。以 FTS 与腹腔镜联合治疗模式为例。Basse 等^[26]认为 FTS 对于腹腔镜的联合应用与传统的治疗手段相比并无明显区别,他们通过观察腹腔镜结直肠手术和开腹手术在应用了 FTS 手段和传统手段之后,患者的术后康复进程无明显差别,从而对 FTS 的有效性和广泛性产生了质疑。但是 King 等^[27-30]通过类似的手术实验发现 FTS 相比较于传统的治疗方法有明显的优势。这种对于 FTS 的探讨在许多国家都是存在的,只有在明确了 FTS 的有效性以及应用范围之后才能实现 FTS 的深入推广。

本研究将 FTS 与腹腔镜联合应用,在围手术期,手术期,术后均贯彻了 FTS,患者手术时间、术中出血量、肠功能恢复时间、术前平均住院天数、术后平均住院天数、平均住院天数、平均费用、留置胃管时间、留置尿管时间均短于未接受 FTS 的患者。同时,患者术后血清 CRP、降钙素原、IL-6、皮质醇也明显降低,表明 FTS 与腹腔镜联合应用能显著降低机体的应激反应。

当然,FTS 并不适用于所有的患者以及所有的症状,其也存在着一定的不足之处。由于统观念根深蒂固,外科医生对 FTS 的接受程度不平衡,多学科协作模式不能有效建立,也制约了 FTS 在临床的有效开展。近年来,在医患关系日益紧张的大背景下,国内的医院以及外科医生一般采用传统的治疗手段,把手术安全性放在治疗的第一位,外科医生不敢尝试新的技术手段,从而限制了 FTS 的应用。随着指南的更新和法制的健全,可能有助于免除这些后顾之忧。一些地区的医保政策也不利于 FTS 的全面推广,国家应逐步完善医保政策,将医疗过程的各个环节纳入到全民医保体系之中,制定完备的医疗保障体系,减少患者的医疗支出,使患者能够接受更高质量的医疗服务。

随着医学模式的转变和以患者为中心的医疗体系的建立,FTS 在保障了治疗效果的同时实现了患者的快速康复,不仅减少了患者的医疗支出,还实现了医疗资源的高效利用,有效降低医疗运行成本,使医疗资源发挥最大化。

参考文献(References)

- [1] Shisong Zhang, Juan Li, Yurui Wu, Yuanjun Hu, et al. Comparison of Laparoscopic-Assisted Operations and Laparotomy Operations for the Treatment of Hirschsprung Disease [J]. *Medicine (Baltimore)*, 2015, 94(39): e1632
- [2] Ahmed Nasr, Katrina J Sullivan, Emily W Chan, et al. Validation of algorithms to determine incidence of Hirschsprung disease in Ontario, Canada: a population-based study using health administrative data[J]. *Clin Epidemiol*, 2017, 9: 579-590
- [3] Benjamin N. Rollo, Dongcheng Zhang, Lincon A. Enteric Neural Cells From Hirschsprung Disease Patients Form Ganglia in Autologous Aneuronal Colon [J]. *Cell Mol Gastroenterol Hepatol*, 2016, 2(1): 92-109
- [4] Lucy C. Sorensen, Kenneth A. Dodge, How Does the Fast Track Intervention Prevent Adverse Outcomes in Young Adulthood? [J]. *Child Dev*, 2016, 87(2): 429-445
- [5] Conduct Problems Prevention Research Group. The Implementation of the Fast Track Program: An Example of a Large-Scale Prevention Science Efficacy Trial[J]. *J Abnorm Child Psychol*, 2002, 30(1): 1-17
- [6] Mihai Paduraru, Luca Ponchiatti, Isidro Martinez Casas. Enhanced Recovery after Emergency Surgery: A Systematic Review[J]. *Bull Emerg Trauma*, 2017, 5(2): 70-78
- [7] Robert H. Thiele, Karthik Raghunathan, C. S. Brudney, American Society for Enhanced Recovery (ASER) and Perioperative Quality Initiative (POQI) joint consensus statement on perioperative fluid management within an enhanced recovery pathway for colorectal surgery[J]. *Perioper Med (Lond)*, 2016, 5: 24
- [8] A. Feldheiser, O. Aziz, G. Baldini, B. P. B. W. Cox, et al. Enhanced Recovery After Surgery (ERAS) for gastrointestinal surgery, part 2: consensus statement for anaesthesia practice [J]. *Acta Anaesthesiol Scand*, 2016, 60(3): 289-334
- [9] Stefano Bona, Mattia Molteni, Riccardo Rosati. Introducing an enhanced recovery after surgery program in colorectal surgery: A single center experience [J]. *World J Gastroenterol*, 2014, 20 (46): 17578-17587
- [10] Kehlet H, Wilmore DW. Evidence-based surgical care and the evolution of fast-track surgery. [J]. *Ann Surg*, 2008, 248: 189-198
- [11] Feng F, Ji G, Li JP, et al. Fast-track surgery could improve postoperative recovery in radical total gastrectomy patients [J]. *World J Gastroenterol*, 2013, 19(23): 3642-3648
- [12] Zhou T, Wu X T, Zhou Y J, et al. Early removing gastrointestinal decompression and early oral feeding improve patients' rehabilitation after colectostomy [J]. *World J Gastroenterol*, 2006, 12: 2459-2463
- [13] Itou K, Fukuyama T, Sasabuchi Y, et al. Safety and efficacy of oral rehydration therapy until 2 h before surgery: a multicenter randomized controlled trial[J]. *J Anesth*, 2012, 26: 20-27
- [14] Ni CY, Yang Y, Chang YQ, et al. Fast-track surgery improves postoperative recovery in patients undergoing partial hepatectomy for pri-

- mary liver cancer: A prospective randomized controlled trial[J]. *Eur J Surg Oncol*, 2013, 39(6): 542-547
- [15] Feroci F, Lenzi E, Baraghini M, et al. Fast-track surgery in real life: how patient factors influence outcomes and compliance with an enhanced recovery clinical pathway after colorectal surgery [J]. *United European Gastroenterol J*, 2013, 23(3): 259-265
- [16] Feroci F, Lenzi E, Baraghini M, et al. Fast-track colorectal surgery: protocol adherence influences postoperative outcomes [J]. *Int J Colorectal Dis*, 2013, 28(1): 103-109
- [17] Kim JW, Kim WS, Cheong JH, et al. Safety and efficacy of fast-track surgery in laparoscopic distal gastrectomy for gastric cancer: a randomized clinical trial[J]. *World J Surg*, 2012, 36(12): 2879-2887
- [18] Rao JH, Zhang F, Lu H, et al. Effects of multimodal fast-track surgery on liver transplantation outcomes [J]. *Hepatobiliary Pancreat Dis Int*, 2017, 16(4): 364-369
- [19] Wilmore DW, Kehlet H. Management of patients in fast track surgery [J]. *BMJ*, 2001, 322: 473-476
- [20] Vesterby MS, Pedersen PU, Laursen M, et al. Telemedicine support shortens length of stay after fast-track hip replacement [J]. *Acta Orthop*, 2017, 88(1): 41-47
- [21] Dong Q, Zhang K, Cao S, et al. Fast-track surgery versus conventional perioperative management of lung cancer-associated pneumonectomy: a randomized controlled clinical trial [J]. *World J Surg Oncol*, 2017, 15(1): 20
- [22] Chong W, Che XY, Wan W, et al. Application of fast-track surgery concept in the perioperative nursing care of andrological patients: A randomized controlled study [J]. *Asian J Androl*, 2016, 22 (11): 1001-1004
- [23] Wei YN, Li NF, Cai XY, et al. Clinical application of fast-track surgery with Chinese medicine treatment in the devascularization operation for cirrhotic portal hypertension [J]. *Chin J Integr Med*, 2015, 21(10): 784-790
- [24] Williamsson C, Karlsson N, Stureson C, et al. Impact of a fast-track surgery programme for pancreaticoduodenectomy[J]. *West Engl Med J*, 2015, 102(9): 1133-1141
- [25] Ansari D, Gianotti L, Schröder J, et al. Fast-track surgery: procedure-specific aspects and future direction. *Langenbecks [J]. Arch Surg*, 2013, 398: 29-37
- [26] Basse L, Jakobsen DH, Bardram L, et al. Functional recovery after open versus laparoscopic colonic resection: a randomized, blinded study[J]. *Ann Surg*, 2005, 241: 416-423
- [27] King PM, Blazeby JM, Ewings P, et al. Detailed evaluation of functional recovery following laparoscopic or open surgery for colorectal cancer within an enhanced recovery programme [J]. *Int J Colorectal Dis*, 2008, 23: 795-800
- [28] Oliver J, Harrison, Neil J, Smart, Paul White, Operative Time and Outcome of Enhanced Recovery After Surgery After Laparoscopic Colorectal Surgery[J]. *JSLS*, 2014, 18(2): 265-272
- [29] Frontera D, Arena L, Corsale I, et al. Fast track in colo-rectal surgery. Preliminary experience in a rural hospital [J]. *G Chir*, 2014, 35(11-12): 293-301
- [30] Gonenc M, Dural AC, Celik F, et al. Enhanced postoperative recovery pathways in emergency surgery: a randomised controlled clinical trial[J]. *Am J Surg*, 2014, 207(6): 807-814

(上接第 1718 页)

- [18] Demircioglu RI, Gozdemir M, Usta B, et al. Comparison of intrathecal plain articaine and levobupivacaine with fentanyl for Caesarean section[J]. *Clin Invest Med*, 2016, 39(6): 27516
- [19] Dourado AD, Filho RL, Fernandes RA, et al. Sufentanil in combination with low-dose hyperbaric bupivacaine in spinal anesthesia for cesarean section: a randomized clinical trial [J]. *Braz J Anesthesiol*, 2016, 66(6): 622-627
- [20] Ohnesorge H, Alpes A, Baron R, et al. Influence of intraoperative remifentanyl and sufentanil on sensory perception: a randomized trial [J]. *Curr Med Res Opin*, 2016, 32(11): 1797-1805
- [21] Wilwerth M, Majcher JL, Van der Linden P. Spinal fentanyl vs. sufentanil for post-operative analgesia after C-section: a double-blinded randomised trial [J]. *Acta Anaesthesiol Scand*, 2016, 60(9): 1306-1313
- [22] Hronová K, Pokorný P, Posch L, et al. Sufentanil and midazolam dosing and pharmacogenetic factors in pediatric analgesedation and withdrawal syndrome[J]. *Physiol Res*, 2016, 65(4): S463-S472
- [23] Dede H, Takmaz O, Ozbasli E, et al. Higher Level of Oxidative Stress Markers in Small for Gestational Age Newborns Delivered by Cesarean Section at Term [J]. *Fetal Pediatr Pathol*, 2017, 36 (3): 232-239
- [24] Gosselin P, Chabot K, Béland M, et al. Fear of childbirth among nulliparous women: Relations with pain during delivery, post-traumatic stress symptoms, and postpartum depressive symptoms[J]. *Encephale*, 2016, 42(2): 191-196
- [25] van Gulik L, Ahlers S, van Dijk M, et al. Procedural pain does not raise plasma levels of cortisol or catecholamines in adult intensive care patients after cardiac surgery [J]. *Anaesth Intensive Care*, 2016, 44(1): 52-56
- [26] Visser E, Gosens T, Den Ouden BL, et al. The course, prediction, and treatment of acute and posttraumatic stress in trauma patients: A systematic review[J]. *J Trauma Acute Care Surg*, 2017, 82(6): 1158-1183