

doi: 10.13241/j.cnki.pmb.2021.13.025

胃肠外科术后 ERAS 及大承气冲剂对患者手术应激影响 *

毛泽峰¹ 张成刚² 欧宏宇³ 董海成¹ 陈晋超¹

(1 青海省中医院外一科 青海 西宁 810000; 2 上海中医药大学附属岳阳医院普外科 上海 200437;

3 青海省人民医院普外科 青海 西宁 810007)

摘要 目的:探讨胃肠外科术后加速康复外科(enhanced recovery after surgery, ERAS)及大承气冲剂对患者手术应激影响。**方法:**选取我院近 3 年所收治的 80 例胃肠外科手术患者,将其随机分为研究组和对照组,每组患者 40 例,两组患者围手术期分别采取 ERAS 及大承气冲剂、传统处理方法及常规西医治疗结合安慰剂,对比围手术期不同处理方式对患者手术应激影响。**结果:**两组患者手术前心理(汉密尔顿焦虑量表(Hamilton Anxiety Scale, HAMA))、生理(C 反应蛋白(CRP)、肾上腺素、皮质醇)应激指标对比无统计学差异($P>0.05$),手术后 7 d, 研究组患者各项应激指标均明显低于对照组($P<0.05$);研究组患者术后首次排气时间、术后首次排便时间、术后首次下床活动时间、平均住院时间均明显短于对照组($P<0.05$);两组患者手术前各营养状态对比均无统计学差异($P>0.05$),对比指标发现,各营养指标均应激降低后,逐渐恢复,研究组患者术后 3 d 降低程度明显低于对照组($P<0.05$),在手术后 7 d 逐渐恢复术前水平。**结论:**胃肠外科术后 ERAS 及大承气冲剂更有利于患者术后胃肠功能恢复,术后应激反应更轻,促使患者机体营养状态稳定,可缩短患者的住院时间,促使患者术后康复,值得临床上推广应用。

关键词: 胃肠外科; ERAS; 大承气冲剂; 手术应激

中图分类号: R735.2; R656; R242 **文献标识码:** A **文章编号:** 1673-6273(2021)13-2522-04

Effects of ERAS and Dachengqi Granules on Surgical Stress of Patients after Gastrointestinal Surgery*

MAO Ze-feng¹, ZHANG Cheng-gang², OU Hong-yu³, DONG Hai-cheng¹, CHEN Jin-chao¹

(1 Department of Surgery, Qinghai Provincial Hospital of Traditional Chinese Medicine, Xining, Qinghai, 810000, China;

2 Department of General Surgery, Yueyang Hospital, Shanghai University of Traditional Chinese Medicine, Shanghai, 200437, China;

3 General Surgery of Qinghai Provincial People's Hospital, Xining, Qinghai, 810007, China)

ABSTRACT Objective: To investigate the effect of ERAS and Dachengqi Granules on surgical stress in patients after gastrointestinal surgery. **Methods:** Eighty gastrointestinal surgery patients admitted to our hospital in the past 3 years were randomly divided into a research group and a control group, with 40 patients in each group. ERAS and Dachengqi granules were taken in the two groups, Traditional treatment methods and conventional Western medicine treatment combined with placebo, comparing the effects of different treatment methods on patients' surgical stress during the perioperative period. **Results:** There was no statistically significant difference in pre-operative psychological (HAMA) and physiological (CRP, epinephrine, cortisol) stress indicators between the two groups of patients ($P>0.05$). Seven days after surgery, all stress indicators of the study group were obvious Lower than the control group ($P<0.05$). The first exhaustion time, the first postoperative defecation time, the first time after bed activity, and the average hospital stay of the study group were significantly shorter than those of the control group ($P<0.05$). There was no statistical difference between the nutritional status of the patients in the group before the operation ($P>0.05$). The comparison index found that each nutrition index gradually recovered after the stress was reduced, and the decrease in the 3 d postoperative period of the study group was significantly lower than that of the control group ($P<0.05$), and gradually returned to the preoperative level 7 days after the operation. **Conclusion:** ERAS and Dachengqi granules after gastrointestinal surgery are more conducive to the recovery of gastrointestinal function of patients after surgery, the postoperative stress response was lighter, and the nutritional status of patients is stable, which can shorten the hospitalization time of patients and encourage patients to postoperatively. Rehabilitation is worthy of clinical application.

Key words: Gastrointestinal surgery; ERAS; Dachengqi granules; Surgical stress

Chinese Library Classification(CLC): R735.2; R656; R242 **Document code:** A

Article ID: 1673-6273(2021)13-2522-04

前言

胃肠外科手术治疗时期,因受患者心理、麻醉、手术以及疼痛等因素影响,都会给患者带来不同程度的影响,产生强烈的

* 基金项目:国家自然科学基金项目(81760329)

作者简介:毛泽峰(1980-),男,本科,主治医师,研究方向:普外科,电话:13734600550, E-mail: mzfz180@163.com

(收稿日期:2020-10-27 接受日期:2020-11-22)

手术应激反应,致使患者机体产生大量应激激素,进而出现血压升高、供氧不足、心率加快等症状,影响外科手术效果^[1,2]。对此,对胃肠外科手术患者实施有效的围手术期处理尤为重要^[3]。ERAS(加速康复外科)有机结合麻醉、外科、心理及护理等学科改善患者基础状态及器官功能紊乱,减轻患者的手术应激状态,促使患者术后康复^[4,6]。大承气冲剂是通里攻下法代表方剂,可促进肠道蠕动,改善肠黏膜上皮细胞功能,减少内毒素^[7,8]。ERAS及大承气冲剂联合应用在胃肠外科手术患者中是否有实际益处,截止到现在尚无统一论^[9,10],对此,本研究选取我院近3年所收治的80例胃肠外科手术患者开展研究,通过收

集更加全面的指标,旨在探讨胃肠外科术后ERAS及大承气冲剂对患者手术应激影响。

1 资料与方法

1.1 一般资料

选取我院近3年所收治的80例胃肠外科手术患者,将其随机分为研究组和对照组,每组患者40例,两组患者在性别、年龄、疾病类型等一般资料如表1,两组患者上述资料经比较无统计学差异($P>0.05$),可对比。本研究均经过我院医学伦理委员会批准及患者本人的同意。

表1 两组患者一般资料对比

Table 1 Comparison of general information between the two groups

Groups	n	Gender (Male / female)	Age (year)	Type of disease (n)					
				Appendicitis	Gastric ulcer with bleeding	Acute intestinal obstruction	Pyloric obstruction	Gastric cancer	Other
Research group	40	23/17	54.34± 1.32	16	7	4	6	4	3
Control group	40	24/16	54.41± 1.40	15	8	5	7	3	2

1.2 治疗方法

1.2.1 研究组 研究组患者施行ERAS及大承气冲剂,具体如下:(1)ERAS处理方式:①术前科学评估患者的营养状况,对患者进行健康宣教,介绍ERAS理念、胃肠外科手术等相关知识,积极控制患者的基础疾病,指导患者锻炼肺功能;术前1d饮食正常,术前6h禁食,2h禁水,术前2h服500mL葡萄糖(浓度10%);全身麻醉后放置导尿管;术中控制输液速度及输液量。②术中注意保暖,包括室内温度、冲洗液体温度;不常规放置引流管,若放置引流管,则于术后1~2d拔除。③术后控制静脉输液,低于1500mL,清醒后可少量饮水;术后24h拔除尿管;术后在床上翻身运动,鼓励患者尽早下床活动^[4]。(2)大承气冲剂:生产厂家:汉方医药有限公司;批准文号:HKP-14286;主要成分:厚朴,大黄,芒硝,枳实;用法用量:水煎,先煮厚朴、枳实,大黄后下,芒硝溶服,疗程5d。

1.2.2 对照组 对照组患者施行传统处理方法及常规西医治疗结合安慰剂,具体如下:(1)传统处理方式:①手术前予以常规健康宣教,未进行专门教育;术前10h禁食,术前8h禁水;常规留置导尿管、胃管。②术中不控制输液;无术中保温处理;常规放置引流管。③术后静脉补液约3000mL;术后3~4d,锻炼膀胱功能后拔出导尿管;视情况拔出引流管。(2)常规西医治疗结合安慰剂:氯化钠、葡萄糖、乳糖、淀粉等无药理作用物质

构成,胃管注入,疗程5d。

1.3 评价标准

对比两组患者的手术应激指标、术后康复指标、营养状态。(1)手术应激指标:从心理、生理两个方面评定两组患者的手术前及手术后5d应激指标,其中心理应激指标采取HAMA^[11,12]评定两组患者的焦虑情绪,生理应激指标包括CRP、肾上腺素、皮质醇,由检验科进行统一检验。(2)术后康复指标:术后首次排气时间、首次排便时间、首次下床活动时间、平均住院时间。(3)营养状态^[13]:评定两组患者手术前、手术3d后、手术后7d营养状态,包括前白蛋白、淋巴细胞计数及血清白蛋白。

1.4 统计学方法

采取统计学软件SPSS 22.0对本研究数据进行分析,手术应激指标、术后康复指标、营养状态等计量资料采取平均数±标准差($\bar{x} \pm s$)表示,计数资料采取百分数表示,分别行t、 χ^2 检验,以 $P<0.05$ 为差异,表示具有统计学意义。

2 结果

2.1 两组患者手术应激指标对比

两组患者手术前心理(HAMA)、生理(CRP、肾上腺素、皮质醇)应激指标对比无统计学差异($P>0.05$),手术后7d,研究组患者各项应激指标均明显低于对照组($P<0.05$),如表2所示。

表2 两组患者手术应激指标对比($\bar{x} \pm s$)

Table 2 Comparison of surgical stress indexes between the two groups ($\bar{x} \pm s$)

Groups	n	HAMA (Score)		CRP (mg/L)		Adrenaline (ng/L)		Cortisol (ng/L)	
		Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery
Research group	40	13.41± 3.47	9.23± 2.30**	10.23± 4.20	35.30± 12.23**	95.39± 17.54	130.18± 11.30**	104.51± 3.60	118.62± 4.31**
Control group	40	13.39± 3.51	12.21± 3.13*	10.30± 4.21	56.90± 11.30*	95.23± 16.63	155.21± 19.40*	104.60± 3.71	133.40± 14.32*

Note: Compared with before treatment, * $P<0.05$; compared with the control group, ** $P<0.05$.

2.2 两组患者术后康复相关指标对比

研究组患者术后首次排气时间、术后首次排便时间、术后

首次下床活动时间、平均住院时间均明显短于对照组 ($P < 0.05$), 如表 3 所示。

表 3 两组患者术后康复相关指标对比($\bar{x} \pm s$)

Table 3 Comparison of relevant indexes of postoperative rehabilitation between the two groups ($\bar{x} \pm s$)

Groups	Cases	Postoperative first exhaust time(h)	Time of first bowel movement after operation(h)	Activity time after getting out of bed for the first time(d)	Hospitalization time (d)
Research group	40	17.49 $\pm$ 0.73*	28.57 $\pm$ 1.79*	1.24 $\pm$ 0.59*	5.11 $\pm$ 1.03*
Control group	40	28.45 $\pm$ 1.30	35.30 $\pm$ 2.59	3.54 $\pm$ 0.22	7.53 $\pm$ 1.51

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

2.3 两组患者营养状态对比

两组患者手术前各营养状态对比均无统计学差异 ($P > 0.05$), 对比指标发现, 各营养指标均应降低后, 逐渐恢复, 研

究组患者术后 3 d 降低程度明显低于对照组 ($P < 0.05$), 在手术后 7 d 逐渐恢复术前水平, 如表 4 所示。

表 4 两组患者手术前后营养状态对比($\bar{x} \pm s$)

Table 4 Comparison of nutritional status between two groups of patients before and after operation ($\bar{x} \pm s$)

Groups	n	Prealbumin (mg/L)			Lymphocyte count ($\times 10^9/L$)			Serum albumin(g/L)		
		Before surgery	3 d after surgery	7 d after operation	Before surgery	3 d after surgery	7 d after operation	Before surgery	3 d after surgery	7 d after operation
Research group	40	169.21 $\pm$ 26.31	142.30 $\pm$ 12.45* [#]	165.29 $\pm$ 19.13	1.49 $\pm$ 0.21	1.28 $\pm$ 0.19* [#]	1.43 $\pm$ 0.16	33.87 $\pm$ 3.14	30.65 $\pm$ 2.45* [#]	32.65 $\pm$ 2.13
		168.65 $\pm$ 25.24	130.71 $\pm$ 11.54*	147.75 $\pm$ 18.54		1.12 $\pm$ 0.13*	1.19 $\pm$ 0.17	33.90 $\pm$ 3.20	28.91 $\pm$ 1.85*	29.13 $\pm$ 2.54

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

3 讨论

胃肠系统是人体重要系统之一, 患者术后康复水平除了受外科手术医生水平影响, 还和围术期有效控制外科手术及各种损伤因素等有直接关系^[14,15]。最近几年, 随着医疗技术水平的不断提高, 护理观念的不断转变, 胃肠外科以患者术后快速康复、提升生活质量、提高整体手术疗效为目标^[16,17]。ERAS 是依据临床中有明确依据的循证医学方案, 整合围术期护理策略, 优化临床决策, 充分体现整体医学模式在现代外科的应用, 尽可能减少手术应激反应, 促使患者病情快速康复, 提高患者术后生活质量, 促进和谐医患关系^[18-20]。大承气冲剂可调节、增强胃肠运动功能, 促进肠蠕动; 通里攻下, 抑制肠黏膜屏障功能障碍, 排除肠道菌素, 减少肠道细菌移位, 灭活内毒素; 可保护重要脏器, 活血化瘀, 改善微循环, 改善胃肠血液循环, 抗炎抑菌, 可减少手术应激反应, 缩短术后生理恢复时间, 缓解患者痛苦^[21,22]。ERAS 及大承气冲剂都可以加快患者胃肠功能恢复, 促使病情康复, 但对于两者结合应用的临床效果还存在一定争论^[23], 本研究就此开展研究。

应激是机体在受到创伤后造成内分泌、神经、内稳定发生改变^[24]。对于胃肠外科患者, 术前禁食禁水、血糖状态、肠道准备、手术创伤、麻醉、输血输液、术后疼痛、术后禁食禁水等都会造成机体发生应激反应, 增加糖皮质激素、儿茶酚胺, 导致机体发生高分解代谢、炎症反应等^[25,26]。经过本研究结果显示, 研究组患者手术应激轻, 其术后 HAMA、CRP、肾上腺素、皮质醇均

明显低于对照组, 且术后恢复快, 术后首次排气时间、术后首次排便时间、术后首次下床活动时间、平均住院时间均明显短于对照组。与黄丹丹^[27]研究类似, 通过总结分析发现 ERAS 联合中药应用于普外科手术中, 轻手术应激反应, 减少并发症的发生, 加速患者术后的康复; 蔡宁^[28]的研究也发现 ERAS 理念在脊柱后凸畸形矫形手术麻醉管理中的应用, 与传统围术期管理方式相比, 施行 ERAS 理念的患者的血糖、皮质醇浓度和 CRP 水平均明显降低, 麻醉清醒时间、术中出血量、48 h 内 VAS 评分均降低, 肠道恢复时间、首次进食时间、住院时间均明显缩短, 术后球结膜水肿及恶心呕吐等不良反应发生率人数明显减少, 可明显抑制患者应激反应。可见, 胃肠外科术后 ERAS 及大承气冲剂可减轻患者的手术应激反应, 促使患者病情康复, 缩短患者术后康复时间。

营养状态评估是胃肠外科手术中重要内容, 营养状态受手术应激反应、术前营养状态摄入、术后能量摄入等因素影响^[29,30]。据相关研究表明^[31,32], 积极纠正术前营养不浪, 为手术创造良好条件, 并且可避免手术风险, 降低并发症。本研究从前白蛋白、淋巴细胞计数、血清白蛋白等方面评估两组患者的营养状态, 结果显示, 研究组患者术后营养水平明显优于对照组, 与周建刚^[33]等学者的研究类似, 该学者也发现, 与传统方法相比, ERAS 理念对腹腔镜胃癌根治术病人术后患者首次肠排气时间早、住院时间短、住院花费少, 白细胞计数均先应激上升后逐渐恢复, 在术后 3 d 前白蛋白、血清白蛋白、淋巴细胞计数下降幅度较低, 并在术后 7 d 恢复接近术前水平, 由此提示, 胃肠外

科术后 ERAS 及大承气冲剂更有利于患者维持稳定的营养状态,并且此结果和研究组患者术后应激反应低有直接关系。

总而言之,胃肠外科术后 ERAS 及大承气冲剂更有利于患者术后胃肠功能恢复,术后应激反应更轻,促使患者机体营养状态稳定,可缩短患者的住院时间,促使患者术后康复,值得临床上推广应用。

参考文献(References)

- [1] 张永宏,陆王锋,任博博,等.贵门胃底癌近端胃大部切除间置空肠双通道吻合术和全胃切除术的近远期疗效观察[J].川北医学院学报, 2019, 34(1): 110-113
- [2] Olivares MC, María Labalde Martínez, Torralba M, et al. C-reactive protein as a marker of the surgical stress reduction within an ERAS protocol (Enhanced Recovery After Surgery) in colorectal surgery: A prospective cohort study[J]. J Surg Oncology, 2018, 117(4): 717-724
- [3] Masaki, Kaibori, Go. Perioperative management for gastrointestinal surgery after instituting interventions initiated by the Japanese Society of Surgical Metabolism and Nutrition [J]. Asian J Surgery, 2020, 43 (1): 124-129
- [4] 温琳娜.盐酸氢吗啡酮对腹腔镜胆囊切除患者血流动力学和苏醒质量的影响[J].川北医学院学报, 2017, 32(3): 384-386, 394
- [5] Man L, Junjie Z, Gan TJ, et al. Enhanced recovery after surgery pathway for patients undergoing cardiac surgery: a randomized clinical trial[J]. Eur J Cardiothorac Surg, 2018, 54(3): 491-497
- [6] Shuo, Qi, Guodon. Safety and efficacy of enhanced recovery after surgery (ERAS) programs in patients undergoing hepatectomy: A prospective randomized controlled trial [J]. J Clin Lab Anal, 2018, 32 (6): e22434
- [7] Su Q, Yu Y, Liu JS, et al. A Randomized, Double-Blind, Multicenter, Placebo-Controlled Trial of Qi-Zhi-Wei-Tong Granules on Postprandial Distress Syndrome-Predominant Functional Dyspepsia [J]. Chin Med J (Engl), 2018, 131(13): 1549-1556
- [8] Wang Q, Zhao Y, Sha N, et al. The systemic bone protective effects of Gushukang granules in ovariectomized mice by inhibiting osteoclastogenesis and stimulating osteoblastogenesis [J]. J Pharmacol Sci, 2018, 136(3): 155-164
- [9] Lubowski, David Z. Response to Re: Enhanced Recovery After Surgery and laparoscopic colorectal surgery: where to now?[J]. Anz Journal of Surgery, 2015, 85(1-2): 95-96
- [10] Grant MC, Yang D, Wu CL, et al. Impact of Enhanced Recovery After Surgery and Fast Track Surgery Pathways on Healthcare-associated Infections: Results From a Systematic Review and Meta-analysis[J]. Annals Surgery, 2017, 265(1): e68
- [11] Gale C, Glue P, Guaiana G, et al. Influence of covariates on heterogeneity in Hamilton Anxiety Scale ratings in placebo-controlled trials of benzodiazepines in generalized anxiety disorder: Systematic review and meta-analysis[J]. J Psychopharmacol, 2019, 33(5): 543-547
- [12] An H, Zeng X, Niu T, et al. Quantifying iron deposition within the substantia nigra of Parkinson's disease by quantitative susceptibility mapping[J]. J Neurological sciences, 2018, 386(12): 46-52
- [13] Nobuya D, Yui M, Ryuma T, et al. Controlling Nutritional Status (CONUT) Score Is a Prognostic Marker in Metastatic Colorectal Cancer Patients Receiving First-line Chemotherapy [J]. Anticancer Research, 2018, 38(8): 4883-4888
- [14] Zheng HL, Lu J, Zheng CH, et al. Short- and Long-Term Outcomes in Malnourished Patients After Laparoscopic or Open Radical Gastrectomy[J]. World Journal of Surgery, 2017, 42(1 Suppl): 1-9
- [15] Skelin M, Lucijani T, Amid I, et al. Factors Affecting Gastrointestinal Absorption of Levothyroxine: A Review [J]. Clinical Therapeutics, 2017, 39(2): 378-403
- [16] Gildasio, S, De. Esmolol does not improve quality of postsurgical recovery after ambulatory hysteroscopy: A prospective, randomized, double-blinded, placebo-controlled, clinical trial [J]. Medicine (Baltimore), 2018, 97(41): e12647
- [17] Schwam ZG, Michaelides E, Kuo P, et al. Thirty-day morbidity and mortality following otologic/neurotologic surgery: Analysis of the national surgical quality improvement program[J]. Laryngoscope, 2018, 128(6): 1431-1437
- [18] Fleary SA. Association Between the Medical Home Model of Care and Demographic Characteristics in US Children [J]. Clinical Pediatrics, 2019, 58(3): 270-281
- [19] Kandarova H, Willoughby JA, Jong WHD, et al. Pre-validation of an in vitro skin irritation test for medical devices using the reconstructed human tissue model EpiDerm[J]. Toxicology in Vitro, 2018, 50(8): B8-B8
- [20] M Olivares Cabellos, M Martínez Labalde, M Torralba. C-reactive protein as a marker of the surgical stress reduction within an ERAS protocol (Enhanced Recovery After Surgery) in colorectal surgery: A prospective cohort study [J]. J Surgical Oncology, 2018, 117 (4): 717-724
- [21] Sun W, Chen Y, Li H, et al. Material basis and molecular mechanisms of Dachengqi decoction in the treatment of acute pancreatitis based on network pharmacology[J]. Biomedicine & pharmacotherapy, 2020, 121: E109656
- [22] X Wang, P Shen, D Tang. Effects of Qi-Fang-Xi-Bi-Granules on Cartilage Morphology and C/ebp α Promoter Methylation in Rats with Knee Osteoarthritis [J]. Evidence Based Complementary & Alternative Medicine, 2018, 2018(5): 1-12
- [23] Wang Jun, Zhang Wensheng, Pei Xiaorui, et al. Effect and Safety of Dachengqi Decoction Combined with Octreotide in Treating Postoperative Early Obstructive Intestinal Obstruction [J]. Liaoning J Traditional Chinese Medicine, 2019, 46 (3): 567-570
- [24] Gayovych VV, Magomedov AM, Makarenko OM, et al. Metabolic changes of skeletal muscles in traumatic injury of peripheral nerve and autoplasty in experiment [J]. Klinicheskaja Khirurgiia, 2016, 11 (3): 58-61
- [25] Gallwitz B, Dagogo-Jack S, Thieu V, et al. Effect of Once-weekly Dulaglutide on HbA1c and Fasting Blood Glucose in Patient Subpopulations by Gender, Duration of Diabetes, and Baseline HbA1c[J]. Diabetes Obesity & Metabolism, 2017, 20(12): 409-418
- [26] Hu D, Zhang X, Lin X, et al. Interaction between fasting blood glucose and tumor embolus in predicting the postoperative prognosis of 4330 Chinese patients with gastrointestinal tract cancer [J]. J Cancer, 2020, 11(4): 867-873
- [27] 黄丹丹, 胡丰良, 孙锋, 等. 中药联合促进术后恢复方案在结直肠癌术后研究进展[J]. 新中医, 2015, 47(3): 251-253

- 2018, 3(5): 432-438
- [13] Varghese T, Schultz WM, McCue AA, et al. Physical activity in the prevention of coronary heart disease: implications for the clinician[J]. Heart, 2016, 102(12): 904-909
- [14] Tian Y, Deng P, Li B, et al. Treatment models of cardiac rehabilitation in patients with coronary heart disease and related factors affecting patient compliance[J]. Rev Cardiovasc Med, 2019, 20(1): 27-33
- [15] Gudiño Gomezjurado A, Pujol Freitas B, Contreira Longatto F, et al. Acute coronary disease, prognosis and prevalence of risk factors in young adults[J]. Medwave, 2017, 17(9): e7088
- [16] Belialov FI. Depressia, trevoga i stress u patsientov s ishemicheskoy bolezn'yu serdtsa Depression, anxiety, and stress in patients with coronary heart disease[J]. Ter Arkh, 2017, 89(8): 104-109
- [17] Theodorakis GN. Coronary artery disease and atrial fibrillation[J]. Hellenic J Cardiol, 2017, 58(3): 213-214
- [18] Rowe WJ. Coronary artery disease and lunar catecholamine cardiomyopathy[J]. Int J Cardiol, 2017, 231: 42-46
- [19] Houston M, Minich D, Sinatra ST, et al. Recent Science and Clinical Application of Nutrition to Coronary Heart Disease[J]. J Am Coll Nutr, 2018, 37(3): 169-187
- [20] Drakopoulou M, Toutouzias K, Stathogiannis K, et al. Managing the lipid profile of coronary heart disease patients[J]. Expert Rev Cardiovasc Ther, 2016, 14(11): 1263-1271
- [21] Chen G, Levy D. Contributions of the Framingham Heart Study to the Epidemiology of Coronary Heart Disease [J]. JAMA Cardiol, 2016, 1(7): 825-830
- [22] Fortini F, Viecelli Dalla Sega F, Caliceti C, et al. Estrogen-mediated protection against coronary heart disease: The role of the Notch pathway[J]. J Steroid Biochem Mol Biol, 2019, 189: 87-100
- [23] Erdmann E. Koronare Herzerkrankung: Fortschritte in Diagnostik und Therapie Coronary Heart Disease: Advances in Diagnostics and Therapy[J]. Dtsch Med Wochenschr, 2017, 142(21): e1565
- [24] Zeikidze S. Coronary Disease Risk Assessment in Asymptomatic Patients[J]. Georgian Med News, 2017, 271: 70-76
- [25] Li D, Zhao L, Yu J, et al. Lipoprotein-associated phospholipase A2 in coronary heart disease: Review and meta-analysis[J]. Clin Chim Acta, 2017, 465: 22-29
- [26] Devezza RC, Elkins M, Saragiotto BT. PEDro systematic review update: exercise for coronary heart disease[J]. Br J Sports Med, 2017, 51(9): 755-756
- [27] Wang Z, Zhu C, Nambi V, et al. Metabolomic Pattern Predicts Incident Coronary Heart Disease [J]. Arterioscler Thromb Vasc Biol, 2019, 39(7): 1475-1482
- [28] Mathews MJ, Mathews EH, Mathews GE. The integrated effect of moderate exercise on coronary heart disease [J]. Cardiovasc J Afr, 2017, 28(2): 125-133
- [29] Su JJ, Yu DSF. Effectiveness of eHealth cardiac rehabilitation on health outcomes of coronary heart disease patients: a randomized controlled trial protocol[J]. BMC Cardiovasc Disord, 2019, 19(1): e274
- [30] Huynh K. Coronary disease: Sex differences in CAD diagnosis[J]. Nat Rev Cardiol, 2016, 13(5): e246

(上接第 2525 页)

- [28] 蔡宁, 代晨旭, 于海洋, 等. 快速康复外科理念在脊柱后凸畸形矫形术麻醉管理中的应用[J]. 中国医药导报, 2019, 16(22): 98-102
- [29] Huisman MG, Veronese G, Audisio RA, et al. Poor nutritional status is associated with other geriatric domain impairments and adverse postoperative outcomes in onco-geriatric surgical patients - A multicentre cohort study[J]. Eur J Surg Oncol, 2016, 42(7): 1009-1017
- [30] Ivana Mikolašević, Lidija Orlić, Vidrih S, et al. Assessment of nutritional status in patients with chronic kidney disease on maintenance hemodialysis[J]. Acta Medica Croatica Časopis Hrvatske Akademije Medicinskih Znanosti, 2014, 68(2): 97-102
- [31] Joo BE, Park SK, Cho KR, et al. Real-time intraoperative monitoring of brainstem auditory evoked potentials during microvascular decompression for hemifacial spasm [J]. J Neurosurg. 2016, 125 (5): 1061-1067
- [32] Anandakumar Amutha, Ranjit Mohan Anjana, Ulagamathesan Venkatesan. Incidence of complications in young-onset diabetes: Comparing type 2 with type 1 (The young diab study)[J]. Diabetes Res Clin Pract, 2017, 123(12): 1-8
- [33] 周建刚, 邵荣, 杨波. 加速康复外科对腹腔镜胃癌根治术病人应激及营养状况的影响[J]. 腹部外科, 2018, 31(5): 354-357, 361