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硬膜外复合全身麻醉对老年开胸手术患者应激和血液流变学的影响

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摘要 目的:探讨硬膜外复合全身麻醉对老年开胸手术患者应激和血液流变学的影响。**方法:**选取了 100 例开胸手术患者,按手术顺序编号将患者随机分为两组,对照组(46 例)开胸手术前给予全身麻醉,观察组(54 例)开胸手术前给予硬膜外复合全身麻醉。通过观察并记录术前、术后 1 h、6 h 的应激指标、血液流变学指标及心率、呼吸频率,评价硬膜外复合全身麻醉对老年开胸手术患者应激和血液流变学的影响。**结果:**术前两组血糖、皮质醇和肾上腺素水平相比,无统计学差异($P>0.05$)。术后 1 h、6 h 两组血糖、皮质醇和肾上腺素水平均升高($P<0.05$),观察组术后 1 h、6 h 血糖、皮质醇和肾上腺素水平均低于对照组($P<0.05$);术后 1 h、6 h 两组全血低切粘度、高切粘度均下降,且观察组全血低切粘度、高切粘度更低($P<0.05$),术前术后两组血浆粘度、红细胞聚集指数相比,无统计学差异($P>0.05$);对照组患者术后 1 h 心率增加且高于观察组($P<0.05$),术后 6 h 心率趋近于术前心率。观察组患者术前术后心率无统计学差异($P>0.05$)。对照组患者术后 1 h、6 h 呼吸频率增加且高于观察组($P<0.05$),观察组患者术前术后呼吸频率无统计学差异($P>0.05$)。**结论:**采用硬膜外复合全麻对老年开胸手术患者的生命体征影响较小,可降低术后应激反应,改善患者体内血液流变学参数,值得临床推广使用。

关键词:硬膜外麻醉;全身麻醉;开胸手术;血液流变学;应激反应

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Effect of Epidural Anesthesia Combined with General Anesthesia on Stress and Blood Rheology in Elderly Patients with Open Thoracic Surgery

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ABSTRACT Objective: To discuss the effect of epidural anesthesia combined with general anesthesia on stress and blood rheology in elderly patients with open thoracic surgery. **Methods:** 100 elderly patients with open thoracic surgery were selected and divided randomly into two groups according to the sequence of operation. The control group (46 cases) was given general anesthesia before surgery. The observation group (54 cases) was given epidural anesthesia combined with general anesthesia before surgery. The effect of epidural anesthesia combined with general anesthesia on the stress and blood rheology was evaluated by the stress indexes, blood rheology indexes, heart rate and respiratory rate before surgery, after 1 h, 6 h surgery. **Results:** There were no statistical significance on blood glucose, cortisol and epinephrine levels between two groups ($P>0.05$). At 1 h, 6 h after surgery, the blood glucose, cortisol and epinephrine levels were increased in two groups ($P<0.05$), and these indexes of observation group was lower than those of the control group($P<0.05$). At 1h, 6h after surgery, the whole blood low shear viscosity and high shear viscosity were decreased($P<0.05$), and these indexes of observation group was lower than those of the control group ($P<0.05$). But there were no statistical significance on the plasma viscosity and erythrocyte aggregation indexes between two groups ($P>0.05$). At 1 h after surgery, the heart rate of observation group was higher than that of the observation group ($P<0.05$), and the heart rate of 6 h after surgery was close to the preoperative heart rate. In the observation group, there were no statistical significance on heart rate before and after surgery ($P>0.05$). After 1 h and 6 h of surgery, the respiratory rate of the control group was higher than that of the observation group ($P<0.05$). In the observation group, there were no statistical significance on respiratory rate before and after surgery ($P<0.05$). **Conclusions:** The epidural anesthesia combined with general anesthesia has little effect on the vital signs of elderly patients with open thoracic surgery, and it can reduce the stress reaction and improve blood rheology parameters of patients, worthy of clinical application.

Key words: Epidural anesthesia; General anesthesia; Thoracic surgery; Blood rheology; Stress response

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前言

开胸肺叶手术常被用于食管癌、非小细胞癌的治疗,该手术具有较大的创伤性,手术不可避免对患者产生较大刺激,再加之麻醉药物和术后的疼痛感,容易引起一系列神经内分泌反应,并由此引起机体各器官功能和代谢变化的应激反应^[1]。较大的应激反应可影响术后远期疗效,甚至康复^[2]。为减少术后应激反应,应选择合理的麻醉方式。单纯全身麻醉方式容易使患者在苏醒期出现烦躁、谵妄及认知功能障碍,采用硬膜外复合全身麻醉的方式,不仅能减少全麻使用的麻醉剂量,也能减少麻醉术后的并发症发生率^[3]。既往研究中,仅对开胸手术后患者应激指标进行探讨,未对患者血液流变学进行分析,而监测患者血液流变学指标对患者远期疗效也具有重要的临床价值^[3,4]。开胸手术容易使患者血液处于高凝状态,加大肺血栓栓塞和深静脉血栓的形成,因此降低血液粘度对预防上述并发症具有重要的临床意义。为了探究硬膜外复合全身麻醉对患者应激和血液流变学的影响,我院自2012年3月-2015年3月选取了100例老年开胸手术患者,分别给予全身麻醉和全身麻醉,比较两种麻醉方法对患者应激和血液流变学的影响及生命体征的影响,现报道如下。

1 资料与方法

1.1 病例资料

选取老年开胸手术患者100例,年限:2012年3月-2015年3月,入选标准:①美国麻醉师协会(ASA)分级为I-II级;②术前认知功能无障碍;③年龄≥65岁;④经本院伦理委员会同意,术前患者签署书面知情同意书。排除标准:合并肝肾功能异常、心力衰竭、脊柱严重畸形、有精神病史、正在或既往服用精神类药物患者。手术种类包括非小细胞癌根治术、食管癌切除术。按手术顺序编号将患者随机分为两组,对照组(46例)在开胸肺叶手术前给予全身麻醉,其中,男32例,女14例,平均年龄(66.7±13.5)岁;观察组(54例)在开胸肺叶手术前给予硬膜外联合全身麻醉,其中,男30例,女24例,平均年龄(66.7±13.5)岁;两组病例资料具有可比性(P>0.05)。

1.2 麻醉方法

观察组:选择胸7-8椎间隙行硬膜外穿刺置管,注入2%利多卡因5作实验量,测试有无脊麻现象,待有硬膜外阻滞平面后注入1.5%利多卡因10 mL。咪达唑仑注射液0.05 mg/kg,丙泊酚2 mg/kg,维库溴铵0.1 mg/kg进行麻醉诱导,气管插管后麻醉机控制呼吸。间断1.0-1.5 h追加上述局麻药5 mL。丙泊酚1 mg/(kg·h)、维库溴铵0.03 mg/(kg·h)维持麻醉。对照组:麻醉诱导同观察组,麻醉诱导后,丙泊酚5 mg/(kg·h)、维库溴铵0.06 mg/(kg·h)维持麻醉。两组均采用2.5 ng/mL瑞芬太尼靶控输注维持镇痛效果。

患者术毕观察生命体征无异常,统一带气管插管进入我院麻醉重症复苏室内观察。

1.3 观察指标

①应激指标:取患者术前、术后1 h、6 h外周静脉血,电化学法测定患者肾上腺素、皮质醇水平,全自动生化分析仪(上海科华实验系统有限公司,注册证编号:沪食药监械(准)字2009第2400530号)测定患者血糖水平;②血液流变学指标:全自动血液流变仪(北京普利生仪器有限公司,注册证编号:京药监械(准)字2011第2400165号)测定患者术前、术后1 h、6 h的全血低切粘度、高切粘度、血液粘度及红细胞聚集指数;③心率及呼吸频率:测量患者术前、术后1 h、6 h每分钟心率和呼吸频率。

1.4 统计方法

采用SPSS 17.0统计软件分析,数据以 $\bar{x} \pm s$ 表示,组内治疗前与治疗后相比采用配对t检验,组间比较采用两独立样本t检验,计数资料采用卡方检验,以P<0.05为差异有统计学意义。

2 结果

2.1 应激指标比较

术前两组血糖、皮质醇和肾上腺素水平相比,无统计学差异(P>0.05),术后1 h、6 h两组血糖、皮质醇和肾上腺素水平均升高(P<0.05),虽然两组术后1 h和6 h的血糖、皮质醇、肾上腺素水平无统计学差异(P>0.05),但术后6 h血糖、皮质醇、肾上腺素较1 h略有降低。观察组术后1 h、6 h血糖、皮质醇和肾上腺素水平均低于对照组(P<0.05),见表1。

表1 两组应激指标对比($\bar{x} \pm s$)

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

Groups		Blood glucose (mmol/L)	Cortisol ($10^3 \times$ mmol/L)	Adrenaline (μ g/L)
Observation group (n=54)	Before surgery	4.32±0.58	0.53±0.21	34.3±5.7
	1 h after surgery	5.63±0.63**	0.67±0.23**	57.6±7.7**
	6 h after surgery	5.34±0.62**	0.61±0.21**	46.2±6.7**
Control group (n=46)	Before surgery	4.36±0.61	0.56±0.26	36.2±6.1
	1 h after surgery	7.72±0.87*	0.92±0.43*	68.9±8.2*
	6 h after surgery	7.25±0.81*	0.83±0.34*	58.3±7.9*

Note: compared with the value before surgery, *P<0.05, compared with the control group, **P<0.05.

2.2 血液流变学指标对比

术前,两组全血低切粘度、全血高切粘度、血浆粘度、红细

胞聚集指数无统计学差异(P>0.05),术后1 h、6 h两组全血低切粘度、高切粘度均下降,且观察组全血低切粘度、高切粘度更低

($P<0.05$),术前术后两组血浆粘度、红细胞聚集指数相比,无统计学差异($P>0.05$),见表2。

表2 两组血液流变学指标($\bar{x}\pm s$)Table 2 Comparison of hemorheology indexes between two groups ($\bar{x}\pm s$)

Groups		Whole blood low shear viscosity (mPa/s)	Whole blood high shear viscosity (mPa/s)	Plasma viscosity (mPa/s)	Red cell aggregation index
Observation group (n=54)	Before surgery	9.83± 3.31	4.23± 1.21	1.42± 0.41	2.38± 0.36
	1 h after surgery	8.62± 2.45*#	3.62± 1.06*#	1.35± 0.38	2.26± 0.32
	6 h after surgery	8.53± 2.12*#	3.51± 1.07*#	1.37± 0.33	2.14± 0.24
Control group (n=46)	Before surgery	9.74± 3.28	4.19± 1.16	1.46± 0.42	2.38± 0.36
	1 h after surgery	9.23± 2.53*	3.92± 0.89*	1.37± 0.22	2.24± 0.27
	6 h after surgery	9.07± 2.23*	3.88± 0.78*	1.33± 0.34	2.16± 0.22

Note: compared with the value before surgery, * $P<0.05$, compared with the control group, # $P<0.05$.

2.3 心率及呼吸频率对比

术前两组心率、呼吸频率无统计学差异($P>0.05$)。对照组患者术后1 h心率增加且高于观察组($P<0.05$),术后6 h心率趋近

于术前心率。观察组患者术前术后心率无统计学差异($P>0.05$)。

对照组患者术后1 h、6 h呼吸频率增加且高于观察组($P<0.05$),观察组患者术前术后呼吸频率无统计学差异($P>0.05$),见表3。

表3 两组心率及呼吸频率比较($\bar{x}\pm s$)Table 3 Comparison of heart rate and respiratory rate between two groups ($\bar{x}\pm s$)

Items	Groups	Before surgery	1 h after surgery	6 h after surgery
Heart rate	Observation group	81.5± 6.8	83.5± 8.6	82.3± 8.8
	Control group(times/min)	82.4± 7.1	103.4± 9.7**	84.1± 8.2
Respiratory rate	Observation group	21.4± 6.2	23.4± 4.3	22.4± 5.9
	Control group(times/min)	22.3± 5.6	29.6± 5.5**	27.8± 5.7**

Note: compared with the value before surgery, * $P<0.05$, compared with the control group, ** $P<0.05$.

3 讨论

肺部疾病是胸外科常见病和多发病,开胸肺叶手术经常用于治疗非小细胞肺癌的治疗,该类肿瘤多发于中老年等体质较差患者,因此临床在选择麻醉方案时需考虑到患者耐受性^[6]。手术、麻醉后疼痛、焦虑等负面情绪均能引起机体强烈的应激反应,改变患者体内血流变学参数^[7-9]。此外,在麻醉苏醒期较多患者出现烦躁、谵妄及不同程度的意识障碍、心率和呼吸频率紊乱等现象出现^[10-12]。由于开胸肺叶手术创伤性大,临床很难减轻手术对机体的刺激性。较大的手术切口、胸膜损伤及术后疼痛感均是引起机体应激反应的因素,这些因素会释放神经冲动,从胸段脊髓传入中枢神经系统或经迷走神经传入脑部,影响其功能,进而引起内分泌系统和微循环系统紊乱^[13,14]。合理的麻醉方式能减轻机体应激反应,改善患者体内血液流变学参数^[15,16]。有研究表明,全麻联合硬膜外麻醉能阻滞外周伤害性刺激,降低交感神经兴奋性,肾上腺素、去甲肾上腺素分泌减少^[17]。此外该种麻醉方式还能减小手术应激反应引起的血小板聚集,防止血液粘稠,改善血液高凝状态,降低术后血栓形成风险^[18]。

皮质醇、肾上腺素、血糖均为反映机体应激反应程度的敏感指标。崔剑等^[19]采用硬膜外复合全身麻醉对20例老年开胸手术患者进行麻醉,术后30 min、术后6 h,患者血糖、皮质醇、

去甲肾上腺素、肾上腺素水平均明显升高,但低于全凭静脉麻醉和吸入麻醉方式。本研究中,术后1 h、6 h两组血糖、皮质醇和肾上腺素水平均升高($P<0.05$),观察组术后1 h、6 h血糖、皮质醇和肾上腺素水平均低于对照组($P<0.05$),与崔剑等研究相仿。说明硬膜外复合全身麻醉能有效抑制皮质醇、肾上腺素分泌,控制血糖水平,降低手术引起的应激反应。陈晓云等^[20]研究发现采用胸段硬膜外阻滞能抑制胸科手术引起的凝血功能增强,降低红细胞聚集和血液黏稠度。本研究中,术后1 h、6 h两组全血低切粘度、高切粘度水平均下降,且观察组全血低切粘度、高切粘度水平更低($P<0.05$),说明采用硬膜外复合全身麻醉可降低血管阻力,加速血流,这与交感神经兴奋性降低,儿茶酚胺分泌减少有关。术前术后两组血浆粘度、红细胞聚集指数无统计学差异,可能是手术结束后,手术和麻醉药物对机体的刺激减小,血浆粘度、红细胞聚集指数逐渐恢复到术前水平有关。采用全身麻醉,手术结束1 h后,患者生命体征不稳定,心率和呼吸频率较快。相比之下,采用硬膜外复合全身麻醉,术后1 h、6 h患者心率和呼吸频率接近术前水平。说明采用硬膜外复合全身麻醉对患者心率、呼吸系统影响较小。

综上所述,采用硬膜外复合全麻对老年开胸手术患者的生命体征影响较小,可降低术后应激反应,改善患者体内血液流变学参数,值得临床推广使用。

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