

doi: 10.13241/j.cnki.pmb.2020.11.031

不同麻醉方式对骨科手术患者血流动力学、术后精神状态及认知功能的影响

高峻峰 秦小杰 郭有才 王海 雷义高[△]

(解放军联勤保障部队第969医院麻醉科 内蒙古 呼和浩特 010051)

摘要 目的:探讨不同麻醉方式对骨科手术患者血流动力学、术后精神状态及认知功能的影响。**方法:**选取2016年1月~2018年12月期间我院收治的89例骨科手术患者,根据数字表法将患者随机分为对照组($n=44$)和研究组($n=45$),对照组给予全身麻醉,研究组给予硬膜外麻醉,比较两组患者围术期指标情况,比较两组患者不同时间点血流动力学、术后精神状态及术后认知功能障碍(POCD)发生率。**结果:**两组患者术中麻醉时间、术中出血量比较,差异无统计学意义($P>0.05$);研究组麻醉药物使用量少于对照组,苏醒时间、语言恢复时间短于对照组($P<0.05$)。两组患者麻醉后术前(T2)时间点平均动脉压(MAP)、心率(HR)均较麻醉前(T1)时间点降低,两组患者手术30 min(T3)、手术结束时(T4)时间点MAP、HR均较T2时间点升高($P<0.05$),但两组患者T1~T4时间点MAP、HR比较,差异无统计学意义($P>0.05$)。对照组术后6 h(T5)~术后72 h(T8)时间点、研究组T5~术后24 h(T7)时间点MMSE评分低于T1时间点($P<0.05$),而研究组T8时间点MMSE评分与T1时间点比较,差异无统计学意义($P>0.05$);研究组T7、T8时间点MMSE评分高于对照组($P<0.05$)。研究组T5、术后12 h(T6)时间点POCD发生率均低于对照组($P<0.05$),两组T7、T8时间点POCD发生率比较,差异无统计学意义($P>0.05$)。**结论:**两种麻醉方式均可对骨科手术患者血流动力学、术后精神状态造成一定影响,但硬膜外麻醉对术后精神状态的影响程度相对更轻,同时还可降低POCD发生率,改善围术期部分指标。

关键词:全身麻醉;硬膜外麻醉;骨科手术;血流动力学;精神状态;认知功能

中图分类号:R68;R614 文献标识码:A 文章编号:1673-6273(2020)11-2143-05

Effects of Different Anesthesia Methods on Hemodynamics, Post-operative Mental State and Cognitive Function in Patients Undergoing Orthopaedic Surgery

GAO Jun-feng, QIN Xiao-jie, GUO You-cai, WANG Hai, LEI Yi-gao[△]

(Department of Anesthesiology, The 969th Hospital of the PLA Joint Logistics Support Force, Hohhot, Inner Mongolia, 010051, China)

ABSTRACT Objective: To investigate the effects of different anesthesia methods on hemodynamics, post-operative mental state and cognitive function in patients undergoing orthopaedic surgery. **Methods:** 89 patients with orthopaedic surgery who were admitted to our hospital from January 2016 to December 2018 were selected, they were randomly divided into control group ($n=44$) and study group ($n=45$) according to the digital table method. The control group was given general anesthesia, and the study group was given epidural anesthesia. The perioperative indexes of the two groups were compared. The hemodynamics, post-operative mental state and the incidence of post-operative cognitive impairment (POCD) were compared between the two groups at different time points. **Results:** There was no significant difference in intraoperative anesthesia time and intraoperative bleeding between the two groups ($P>0.05$). The use of anesthetics in the study group was less than that in the control group, and the wake-up time and language recovery time were shorter than those in the control group ($P<0.05$). The mean arterial pressure (MAP) and heart rate (HR) before anesthesia (T2) time point in both groups were lower than those before anesthesia (T1) time point. The MAP and HR at 30 minutes (T3) and at the end of operation (T4) in both groups were higher than those at T2 time point ($P<0.05$). There was no significant difference in MAP and HR between the two groups at T1-T4 time points ($P>0.05$). The MMSE score of control group at 6 h after operation (T5) ~72 h after operation (T8) time point and study group at T5 ~24 h after operation (T7) time point were lower than that of at T1 time point ($P<0.05$). There was no significant difference in MMSE score between T8 time point and T1 time point in the study group ($P>0.05$). The MMSE scores of T7 and T8 in the study group were higher than those in the control group ($P<0.05$). The incidence of POCD at T5 and 12 h after operation (T6) time points in the study group was lower than that in the control group ($P<0.05$). There was no significant difference in the incidence of POCD at T7

作者简介:高峻峰(1973-),男,本科,主治医师,研究方向:骨科麻醉、老年人麻醉, E-mail: doctorgao123@sina.com

[△] 通讯作者:雷义高(1966-),男,本科,副主任医师,研究方向:老年人麻醉, E-mail: lyg6506425@163.com

(收稿日期:2019-11-06 接受日期:2019-11-30)

and T8 time points between the two groups ($P>0.05$). **Conclusion:** Both anesthesia modes can affect the hemodynamics and post-operative mental state of orthopedic surgery patients, but epidural anesthesia has less effect on post-operative mental state, and it can also reduce the incidence of POCD, it can improve some perioperative indicators.

Key words: General anesthesia; Epidural anesthesia; Orthopaedic surgery; Hemodynamics; Mental state; Cognitive function

Chinese Library Classification(CLC): R68; R614 **Document code:** A

Article ID: 1673-6273(2020)11-2143-05

前言

随着年龄的增长,人体各项机能下降,组织和器官活力不断衰退,肢体活动能力降低,同时由于骨骼系统的退化,需通过手术治疗骨科疾病的患者也越来越多^[1,2]。实施骨科手术会造成较大的创伤,且骨科手术时间较长,致使麻醉药物用量较多,麻醉时间较长,患者发生短期术后认知功能障碍(Postoperative cognitive dysfunction, POCD)的几率偏高^[3]。POCD的持续时间不定,给骨科手术患者带来消极影响,同时也给患者家属带来极大的心理负担。因此,采取有效的干预措施以最大程度的减少POCD的发生率具有积极的临床意义。多数学者认为,POCD的产生与麻醉密切相关^[4,5]。全身麻醉是指麻醉药经呼吸道吸入、静脉或肌肉注射进入体内,产生中枢神经系统的暂时抑制^[6]。硬膜外麻醉是指将局麻药注入硬膜外腔,阻滞脊神经根,暂时使其支配区域产生麻痹^[7]。两者均是临床常用的麻醉方式,但关于上述两种麻醉方式对骨科手术患者的影响尚存在一定争议。本研究就此展开分析,以期临床骨科手术麻醉方式的选择提供参考。

1 资料与方法

1.1 一般资料

选取2016年1月~2018年12月期间我院收治的89例骨科手术患者,纳入标准:(1)均具备手术指征者;(2)精神状态正常者;(3)美国麻醉医师协会(American Society of Anesthesiologists, ASA)评级I~II级者;(4)患者及其家属知情本次研究且已签署了同意书。排除标准:(1)合并肝肾功能障碍者;(2)合并过敏体质者;(3)合并凝血功能障碍者;(4)既往服用影响神经中枢系统类药物;(5)妊娠及哺乳期妇女。根据数字表法将患者随机分为对照组($n=44$)和研究组($n=45$),其中对照组男24例,女20例,年龄28~73岁,平均 (48.73 ± 4.28) 岁;ASA分级:I级23例,II级21例;手术类型:行膝/髋关节置换术25例,下肢骨折内固定术19例。研究组男26例,女19例,年龄30~75岁,平均 (47.91 ± 5.42) 岁;ASA分级:I级23例,II级22例;手术类型:行膝/髋关节置换术27例,下肢骨折内固定术18例。两组患者一般资料比较,差异无统计学意义($P>0.05$),组间具有可比性,本次研究经我院伦理学委员会批准进行。

1.2 方法

两组患者术前均常规禁饮、禁食,术前0.5 h给予肌注阿托品0.5 mg,入室后开放静脉通路,常规监测患者平均动脉压(Mean arterial pressure, MAP)、心率(Heart rate, HR)等。在此基础上,对照组患者实施气管插管全身麻醉,依次静脉注射咪达唑仑(江苏恩华药业股份有限公司,国药准字H20031037,规格:1 mL:5 mg)0.07 mg/kg、依托咪酯(江苏恒瑞医药股份有限

公司,国药准字H32022379,规格:10 mL:20 mg)0.3 mg/kg、注射用苯磺顺阿曲库铵(浙江仙琚制药股份有限公司,国药准字H20090202,规格:5 mg)0.15 mg/kg、舒芬太尼(宜昌人福药业有限责任公司,国药准字H20054256,规格:1 mL:50 μ g)15 μ g,患者肌松完全后行气管插管,参数设置:呼吸频率:9~12次/min;潮气量:8~10 mL/kg;呼末二氧化碳分压:30~40 mmHg。术中经静脉泵入丙泊酚和瑞芬太尼,间断给予芬太尼、顺苯磺酸阿曲库铵维持麻醉。研究组患者给予硬膜外麻醉,经患者L2~3间隙穿刺置管,穿刺成功后,经导管注入0.375%罗哌卡因+1%利多卡因2~3 mL试验剂量,观察5分钟无不良反应后,视具体麻醉平面酌情追加剂量,直至达到满意麻醉效果。两组患者麻醉成功后,均实施手术,术中持续输入生理盐水、乳酸钠林格氏液、浓缩红细胞等维持有效血容量,术后常规使用抗生素及镇痛方案。

1.3 观察指标

(1)比较两组患者围术期指标情况,包括:术中麻醉时间、术中出血量、麻醉药物使用量、苏醒时间、语言恢复时间。(2)记录两组患者麻醉前(T1)、麻醉后术前(T2)、手术30 min(T3)、手术结束时(T4)中的MAP、HR。(3)于T1、术后6 h(T5)、术后12 h(T6)、术后24 h(T7)、术后72 h(T8)采用简易精神状态测量表(Mini mental status examination, MMSE)^[8]评价患者精神状况,MMSE的检测项目包括记忆、定向、语言、计算、运用、视空间以及注意力,总分30分,分数越高,其精神状况越好。(4)统计T5~T8等时间点的POCD发生率,MMSE分数 ≤ 23 分即可判定为POCD。

1.4 统计学方法

所有研究数据均在SPSS25.0软件上运行处理,计数资料用率表示,采用 χ^2 检验;计量资料用 $(\bar{x} \pm s)$ 表示,采用t检验。检验标准设置为 $\alpha=0.05$ 。

2 结果

2.1 两组患者围术期指标比较

两组患者术中麻醉时间、术中出血量比较,差异无统计学意义($P>0.05$);研究组麻醉药物使用量少于对照组,苏醒时间、语言恢复时间短于对照组($P<0.05$);详见表1。

2.2 两组患者不同时间点血流动力学指标比较

两组患者T1~T4时间点MAP、HR比较,差异无统计学意义($P>0.05$);两组患者T2时间点MAP、HR均较T1时间点降低,两组患者T3、T4时间点MAP、HR均较T2时间点升高($P<0.05$);详见表2。

2.3 两组患者不同时间点精神状态比较

两组患者T1时间点MMSE评分比较,差异无统计学意义($P>0.05$);对照组T5~T8时间点、研究组T5~T7时间点MMSE

评分低于 T1 时间点 ($P<0.05$), 而研究组 T8 时间点 MMSE 评分与 T1 时间点比较, 差异无统计学意义 ($P>0.05$); 研究组 T7、T8 时间点 MMSE 评分高于对照组 ($P<0.05$); 详见表 3。

T6 时间点 MMSE 评分与对照组同时时间点比较, 差异无统计学

表 1 两组患者围术期指标比较($\bar{x} \pm s$)Table 1 Comparison of perioperative indicators between two groups($\bar{x} \pm s$)

Groups	Intraoperative anesthesia time(h)	Intraoperative bleeding (mL)	Use of anesthetics (mg)	Wake-up time(min)	Language recovery time(min)
Control group(n=44)	2.79± 0.53	310.07± 23.82	223.62± 10.84	13.73± 1.54	19.83± 2.14
Study group (n=45)	2.77± 0.42	309.49± 25.59	198.58± 7.79	5.20± 0.65	9.82± 1.12
t	0.198	0.111	12.536	34.177	27.735
P	0.844	0.912	0.000	0.000	0.000

表 2 两组患者不同时间点血流动力学指标比较($\bar{x} \pm s$)Table 2 Comparison of hemodynamic parameters at different time points between two groups($\bar{x} \pm s$)

Groups	MAP(kPa)				HR(beats/min)			
	T1	T2	T3	T4	T1	T2	T3	T4
Control group (n=44)	11.53± 0.38	9.38± 0.69*	11.44± 0.65 [#]	11.48± 0.67 [#]	85.25± 6.39	81.45± 5.72*	84.59± 7.21 [#]	85.03± 7.74 [#]
Study group (n=45)	11.55± 0.42	9.41± 0.71*	11.45± 0.58 [#]	11.51± 0.62 [#]	85.28± 5.42	81.49± 6.87*	84.73± 6.10 [#]	85.17± 6.46 [#]
t	0.235	0.202	0.077	0.219	0.024	0.034	0.099	0.093
P	0.814	0.840	0.939	0.827	0.981	0.943	0.921	0.926

Note: Compared with T1 time point, * $P<0.05$; Compared with T2 time point, [#] $P<0.05$.

表 3 两组患者不同时间点 MMSE 评分比较($\bar{x} \pm s$, 分)Table 3 Comparison of MMSE scores at different time points between two groups($\bar{x} \pm s$, scores)

Groups	T1	T5	T6	T7	T8
Control group(n=44)	29.14± 0.49	26.41± 0.87*	25.16± 0.76*	26.63± 0.87*	27.02± 0.92*
Study group(n=45)	29.21± 0.53	26.49± 0.72*	25.21± 0.57*	28.59± 0.79*	29.04± 0.77
t	0.647	0.473	0.352	11.131	11.243
P	0.520	0.637	0.726	0.000	0.000

Note: Compared with T1 time point, * $P<0.05$; compared with T5 time point, [#] $P<0.05$; compared with T6 time point, [§] $P<0.05$; compared with T7 time point, ^{*} $P<0.05$.

2.4 两组患者不同时间点 POCD 发生率

05), 两组 T7、T8 时间点 POCD 发生率比较, 差异无统计学意义 ($P>0.05$); 详见表 4。

研究组 T5、T6 时间点 POCD 发生率均低于对照组 ($P<0.05$); 详见表 4。

表 4 两组患者不同时间点 POCD 发生率 例(%)

Table 4 Incidence of POCD at different time points in two groups n(%)

Groups	T5	T6	T7	T8
Control group(n=44)	7(15.91)	10(22.73)	5(11.36)	2(4.55)
Study group (n=45)	1(2.22)	3(6.67)	1(2.22)	(0.00)
χ^2	5.094	4.601	2.957	2.092
P	0.024	0.032	0.086	0.148

3 讨论

随着社会人口老龄化的加剧, 骨骼系统疾病发病率也逐渐

增多, 手术治疗可使患者早期康复, 提高生活质量, 降低病死率^[9,10]。由于患者随着年龄的增长, 其生理各项功能下降, 常伴有一种或多种基础性疾病, 大大增加了围术期麻醉和手术的风

险,增加手术难度^[11,12]。麻醉风险主要体现在术中由于剧烈的刺激、失血导致机体重要脏器血流灌注不足,或因机体缺血再灌注造成组织的二次损伤,以及因器官插管刺激引起血压骤升继而发生心脑血管意外^[13-15]。与此同时,患者接受麻醉后,其脑部血流减少,存在损伤中枢神经元和神经系统的可能,严重者甚至可能造成永久的损害^[16]。骨科手术由于耗时久,需要维持较长的麻醉时间,麻醉药物使用量也随之增多,术后 POCD 发生率也随之增高,影响患者术后恢复^[17-19]。全身麻醉和硬膜外麻醉均是临床常用的麻醉方式,现临床对不同麻醉方式与 POCD 发生率、血流动力学波动以及术后精神状态的关系仍存较大争议。鉴于此,本研究对我院收治的骨科手术患者采用不同麻醉方式处理,设置对照试验,以期临床骨科手术麻醉方式选择提供参考。

本次研究结果显示,研究组麻醉药物使用量少于对照组,苏醒时间、语言恢复时间短于对照组,可见硬膜外麻醉可促进患者术后恢复,这可能是由于硬膜外麻醉麻醉药物使用量少,机体代谢药物时间更短,对大脑代谢、脑细胞造成的损伤更轻,患者更早恢复至麻醉前状态^[20-22]。同时本研究结果还显示,两组患者麻醉期间血流动力学均存在一定波动,随后可恢复至正常水平,可见两种麻醉方式对机体血流动力学的影响程度基本相当,均可维持患者生命体征稳定,促进手术的顺利进行。同时,麻醉可引起机体中枢神经递质及受体系统异常,进而造成学习能力、记忆力的改变,进而影响患者术后精神状态^[23-25]。全身麻醉与硬膜外麻醉均会对骨科手术患者术后精神状态产生影响,但硬膜外麻醉造成的影响程度更轻,术后可更快恢复至正常状态,这可能与硬膜外麻醉对机体中枢神经系统的影响更轻所致^[26,27]。本研究还显示,研究组 T5、T6 时间点 POCD 发生率均低于对照组,两组 T7、T8 时间点 POCD 发生率比较无差异,提示全身麻醉术后早期发生 POCD 的风险较高。这可能是因为全麻使用的咪达唑仑、芬太尼均有一定的致遗忘效果,同时其影响作用还呈明显的剂量依赖性,加之全麻的麻醉药物使用量明显多于硬膜外麻醉,因此对患者认知功能的影响更为显著^[28-30]。

综上所述,全身麻醉和硬膜外麻醉均可对骨科手术患者血流动力学、术后精神状态造成一定影响,但硬膜外麻醉对术后精神状态的影响更小,术后发生 POCD 的风险更低,临床应用价值更高。

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(上接第 2138 页)

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