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丙泊酚在颅脑损伤手术中的效果观察及对血清 CRP、PCT 水平的影响 *

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摘要 目的:分析丙泊酚在颅脑损伤手术中的效果及对血清 C 反应蛋白(CRP)、降钙素原(PCT)水平的影响。**方法:**选择 2016 年 6 月-2019 年 6 月我院收治的颅脑损伤手术患者 90 例纳入本次研究,根据麻醉方式分为观察组(n=46)和对照组(n=44)。对照组使用依托咪酯进行麻醉诱导,观察组采用丙泊酚进行麻醉诱导。比较两组患者呼吸恢复时间、睁眼时间、拔管时间、不同时间血清 CRP、PCT、心率(HR)、平均动脉压(MAP)、收缩压(SBP)及舒张压(DBP)、简易智能量表(MMSE)、视觉模拟(VAS)评分的变化情况及不良反应的发生情况。**结果:**观察组呼吸恢复时间、睁眼时间、拔管时间均显著短于对照组($P<0.05$)。术前,两组血清 CRP、PCT 水平比较无显著差异;术中,两组血清 CRP、PCT 水平均较术前明显下降,且观察组术中血清 CRP、PCT 水平均显著低于对照组($P<0.05$);术前,两组 HR、MAP、SBP 及 DBP 水平无显著差异;术中,两组 HR、MAP、SBP 及 DBP 水平均较术前显著升高,且观察组术中 HR、MAP、SBP 及 DBP 水平均显著低于对照组,术后两组 HR、MAP、SBP 及 DBP 水平均较术中明显下降,且观察组术后以上指标显著低于对照组($P<0.05$);术前,两组 MMSE、VAS 评分水平无明显差异;术后,两组 MMSE、VAS 评分水平均较术前明显下降,且观察组 MMSE 评分水平均显著高于对照组,VAS 评分水平显著低于对照组($P<0.05$);两组不良反应总发生率分别为 4.35%、11.36%,组间比较差异无统计学意义($P>0.05$)。**结论:**丙泊酚可降低颅脑损伤手术患者术中血清 CRP、PCT 水平,稳定血流动力学,并发挥术后镇痛作用。

关键词:丙泊酚;颅脑损伤;C 反应蛋白;降钙素原

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Effect of Propofol on the Craniocerebral Injury Surgery and Serum CRP and PCT Levels*

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ABSTRACT Objective: To study the efficacy of propofol in the Craniocerebral injury surgery and its effect on the serum C-reactive protein (CRP), procalcitonin (PCT) levels. **Methods:** 90 patients with craniocerebral injury who admitted to our hospital from June 2016 to June 2019 were selected and divided into the observation group (n=46) and the control group (n=44). according to the anesthesia method. The control group was given with etomidate, and the observation group was treated by propofol. The changes of respiratory recovery time, eye-opening time, catheter extraction time, serum CRP, PCT, heart rate (HR), mean arterial pressure (MAP), systolic blood pressure (SBP) and diastolic blood pressure (DBP), simple intelligence scale (MMSE), visual simulation (VAS) scores before and after treatment and the occurrence of adverse reactions were compared between the two groups. **Results:** The respiratory recovery time, eye-opening time and extubation time of observation group were significantly shorter than those of the control group ($P<0.05$). Before surgery, there was no significant difference in the serum CRP and PCT levels between the two groups. During the operation, the serum CRP and PCT levels in both groups were significantly decreased compared with those before the operation, and serum CRP and PCT levels in the observation group were significantly lower than those in the control group ($P<0.05$). Before surgery, there was no significant difference in the levels of HR, MAP, SBP and DBP between the two groups. During the operation, the levels of HR, MAP, SBP and DBP in the two groups were significantly higher than those before the operation, which were significantly lower in the observation group than those in the control group. After the operation, the levels of HR, MAP, SBP and DBP in the observation group were significantly lower than those in the control group ($P<0.05$). Before surgery, there was no significant difference in MMSE and VAS scores between the two groups. After surgery, MMSE and VAS scores in the two groups decreased significantly compared with those before surgery, and MMSE scores in the observation group were significantly higher than those in the control group, while VAS scores were significantly lower than those in the control group ($P<0.05$). The total incidence of adverse reactions in the two groups was 4.35% and 11.36%, respectively, no significant difference was found between two groups ($P>0.05$). **Conclusion:** Propofol can reduce the serum

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CRP and PCT levels in patients undergoing craniocerebral injury surgery, stabilize hemodynamics, and play a role in the postoperative analgesia.

Key words: Propofol; Craniocerebral injury; C-reactive protein; Calcitonin original

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前言

颅脑损伤是临床常见的危重症,可单独存在,也可与其他损伤复合存在,病情凶险,发病率仅次于四肢创伤性骨折,致死率和致残率较高,治疗难度大^[1]。多数患者需进行开颅手术,其可有效清除血块、降低颅内压,但手术操作时可能造成脑组织损伤,故需通过合理麻醉来保护脑组织,减轻脑损伤^[2,3]。

丙泊酚是一类短效的烷基酚类静脉麻醉药物,具有起效快、药效强、不良反应少,麻醉维持效果好等优势,已被临床广泛运用到多种手术中^[4]。有研究显示颅脑损伤会导致患者中枢神经系统产生大量炎性因子,从而促发炎症反应^[5]。颅脑损伤炎症反应常用指标包括 CRP、PCT,其中 CRP 是在组织损伤时血浆中一些急剧上升的蛋白质,在一定程度上都可以反映神经系统术后恢复情况;PCT 是降钙素的前肽物质,在机体发生感染或多脏器功能衰竭时,其水平大幅度升高^[6-8]。而丙泊酚对颅脑损伤患者血清 CRP、PCT 水平的影响尚不完全明确。因此,本研究主要探讨了丙泊酚用于颅脑手术中的效果及对血清 CRP、PCT 水平的影响,现报道如下。

1 资料与方法

1.1 一般资料

选择 2016 年 6 月-2019 年 2 月我院收治的颅脑损伤手术患者 90 例纳入本次研究,根据麻醉方式分为 2 组,观察组 46 例,包括男 33 例,女 15 例;年龄 20~75 岁,平均(50.14±5.67)岁,其中交通伤 13 例、坠落伤 11 例、摔伤 12 例、其他 10 例;对照组 44 例,包括男 30 例,女 14 例,年龄 22~76 岁,平均(50.19±5.71)岁,其中交通伤 12 例、坠落伤 13 例、摔伤 11 例、其他 8 例。两组基线资料比较无显著差异($P>0.05$),具有可比性。颅脑损伤诊断标准参照《重型颅脑损伤救治指南》^[9]:(1)明确外伤;

(2)脑挫裂伤、出血等占位明显;(3)影像检查证实。

纳入标准:(1)符合上述诊断标准;(2)年龄 >18 岁;(3)颅内压 >30 mmHg;(4)签署知情同意书。排除标准:(1)重症有生命危险患者;(2)患有意识障碍、精神障碍者;(3)对研究药物成分过敏;(4)妊娠、围产、哺乳期妇女的患者;(5)药物、酒精滥用史;(6)未按规定用药;(7)伤后心脏停止搏动者;(8)依从性较差者。

1.2 治疗方法

两组患者均行开颅血肿清除术;对照组采用依托咪酯(规格:10 mL:20 mg;生产厂家:江苏恩华药业股份有限公司;国药准字:H20020511)0.2 mg/kg 进行麻醉诱导。观察组给予丙泊酚(规格:50 mL:500 mg;生产厂家:AstraZeneca S.p.A.;国药准字:H20080473)2 mg/kg 进行麻醉诱导,以 4 mg/kg/h 维持麻醉。两组均视情况给予舒芬太尼。

1.3 观察指标

采集空腹静脉血 5 mL,以 3000 r·min⁻¹ 的速度进行离心,时间 10 min,提取上层血清后,置于零下 20℃ 的冷冻箱内存储以备检测,采用双抗体夹心酶联免疫吸附法测 CRP、PCT;MMSE 量表:最高 30 分,正常:27~30 分;认知功能障碍: <27 分;疼痛评分均采用视觉模拟评分法进行:0 分表示无痛;分值越高,疼痛感越强;记录手术情况及不良反应发生情况。

1.4 统计学分析

以 SPSS18.0 软件包处理数据,计量资料以均数±标准差($\bar{x}\pm s$)表示,组间比较使用独立样本 t 检验,计数资料以率表示,组间比较采用 χ^2 检验,以 $P<0.05$ 差异具有统计学意义。

2 结果

2.1 两组术后情况的比较

观察组呼吸恢复时间、睁眼时间、拔管时间均显著短于对照组($P<0.05$),见表 1。

表 1 两组术后情况比较($\bar{x}\pm s, h$)

Table 1 Comparison of the postoperative conditions between the two groups($\bar{x}\pm s, h$)

Groups	n	Respiratory recovery time	Open time	Extubation time
Observation group	46	4.21±0.32	7.24±0.43	8.51±0.61
Control group	44	5.69±0.35	8.96±0.58	9.84±0.67
t value		20.951	16.029	9.855
P value		0.000	0.000	0.000

2.2 两组术前和术中血清 CRP、PCT 水平的比较

术前,两组血清 CRP、PCT 水平比较无显著差异;术中,两组血清 CRP、PCT 水平均较术前下降,且观察组术中血清 CRP、PCT 水平均显著低于对照组($P<0.05$),见表 2。

2.3 两组术前、术中和术后 HR、MAP、SBP 及 DBP 水平的比较

术前,两组 HR、MAP、SBP 及 DBP 水平比较无显著差异;

术中,两组 HR、MAP、SBP 及 DBP 水平均较术前升高,且观察组术中 HR、MAP、SBP 及 DBP 水平均显著低于对照组,术后两组 HR、MAP、SBP 及 DBP 水平均较术中有所下降,且观察组低于对照组($P<0.05$),见表 3。

2.4 两组术前和术后 MMSE、VAS 评分的比较

术前,两组 MMSE、VAS 评分比较无明显差异;术后,两组

MMSE、VAS 评分均较术前下降,且观察组 MMSE 评分水平均 表 4。
显著高于对照组,VAS 评分水平显著低于对照组 ($P<0.05$),见

表 2 两组术中和术中血清 CRP、PCT 水平的比较($\bar{x}\pm s$)

Table 2 Comparison of the serum CRP and PCT levels between the two groupspreoperation and intraoperation($\bar{x}\pm s$)

Groups	n	CRP(pg/mL)		PCT(μ g/L)	
		Preoperation	Intraoperation	Preoperation	Intraoperation
Observation group	46	134.79 $\pm$ 26.51	90.78 $\pm$ 30.78	3.29 $\pm$ 0.54	2.62 $\pm$ 0.24
Control group	44	135.12 $\pm$ 26.48	128.53 $\pm$ 34.51	3.24 $\pm$ 0.53	3.09 $\pm$ 0.34
t value		0.071	5.482	0.443	7.603
P value		0.944	0.000	0.659	0.000

表 3 两组术前、术中和术后 HR、MAP、SBP 及 DBP 水平的比较($\bar{x}\pm s$)

Table 3 Comparison of the HR, MAP, SBP and DBP levels between the two groupspreoperation, intraoperationand postoperation($\bar{x}\pm s$)

Groups	n	HR(Times/min)			MAP(mmHg)		
		Preoperation	Intraoperation	Postoperation	Preoperation	Intraoperation	Postoperation
Observation group	46	72.54 $\pm$ 10.42	74.91 $\pm$ 11.42	73.46 $\pm$ 11.04	82.53 $\pm$ 10.24	85.91 $\pm$ 12.21	86.37 $\pm$ 12.19
Control group	44	72.61 $\pm$ 10.48	79.98 $\pm$ 11.79	79.19 $\pm$ 11.31	82.56 $\pm$ 10.26	92.36 $\pm$ 12.68	92.39 $\pm$ 13.76
t value		0.032	2.072	2.432	0.014	2.458	2.199
P value		0.975	0.041	0.017	0.989	0.016	0.030

Groups	n	SBP(mmHg)			DBP(mmHg)		
		Preoperation	Intraoperation	Postoperation	Preoperation	Intraoperation	Postoperation
Observation group	46	130.21 $\pm$ 12.29	137.24 $\pm$ 11.32	130.25 $\pm$ 12.56	89.64 $\pm$ 13.51	95.16 $\pm$ 10.64	90.71 $\pm$ 12.46
Control group	44	130.28 $\pm$ 12.35	159.36 $\pm$ 14.87	141.26 $\pm$ 13.29	89.73 $\pm$ 13.49	110.57 $\pm$ 12.34	99.83 $\pm$ 13.21
t value		0.027	7.962	4.041	0.032	6.353	3.370
P value		0.979	0.000	0.000	0.975	0.000	0.001

表 4 两组术中和术后 MMSE、VAS 评分的比较($\bar{x}\pm s$, points)

Table 4 Comparison of theMMSE and VAS scores between the two groupspreoperation and postoperation($\bar{x}\pm s$, points)

Groups	n	MMSE		VAS	
		Preoperative	Postoperative	Preoperative	Postoperative
Observation group	46	22.31 $\pm$ 3.21	22.69 $\pm$ 2.14	4.12 $\pm$ 0.49	2.31 $\pm$ 0.35
Control group	44	22.29 $\pm$ 3.24	18.87 $\pm$ 2.31	4.08 $\pm$ 0.47	2.97 $\pm$ 0.56
t value		0.029	8.143	0.395	6.736
P value		0.977	0.000	0.694	0.000

3 讨论

颅脑创伤是常见的神经系统损伤性疾病,具有较高的病死率。近年来,其发生率呈逐年上升趋势,调查显示我国每年约 60 万人发生颅脑损伤,给社会及家庭造成巨大经济损失^[10,11]。该病救治过程较为困难,可选择的治疗手段较少,目前临床多以外科手术作为治疗手段^[12]。颅脑手术能快速解除脑血肿挤压,避免脑组织二次损伤,是治疗颅脑损伤的主要手段,但颅脑是人体重要部位,生理结构较为复杂,故手术时间往往较长,且手术会进一步加重患者脑神经元损伤及炎症反应,增高颅内压,减少脑血流量,造成颅脑低氧,加重颅脑损伤。因此,如何有

效减轻患者颅脑损伤是目前医生关注的重点。有研究显示保持平稳的麻醉效果可减少颅脑手术患者发生颅内血肿,降低应激反应、炎症反应,改善患者的预后^[13,14]。

依托咪酯是一种催眠性静脉全麻药,具有保持心血管系统稳定的特点,但其对患者血压和呼吸抑制不明显^[15,16]。丙泊酚是一种降低血管阻力的新型短程静脉麻醉药,在手术麻醉中可减少氧自由基及炎症反应激活,发挥减轻氧化应激反应及炎症反应、调节氨基酸递质分泌等作用,阻止脑水肿发生,有效保护脑组织^[17,18]。有研究显示麻醉诱导常用药物丙泊酚对脑组织具有一定保护作用,该药起效迅速,麻醉诱导平稳,并且苏醒较快^[19]。本研究结果显示使用丙泊酚麻醉的患者呼吸恢复时间、

睁眼时间、拔管时间均显著低于对照组,提示丙泊酚在颅脑损伤手术中有较好的麻醉效果。Kazi AA^[20]等结果也显示丙泊酚有利于加强诱导可控性,麻醉起效速度快,苏醒迅速且功能恢复完善。分析其原因可能是因为丙泊酚在人体组织中可以迅速被溶解,约在 60 秒左右达到血-脑平衡,起效快,因而提高麻醉效果。颅脑损伤患者术后常出现躁动不安及恶心等并发症,增加机体氧耗,不利于术后恢复,而有效镇痛可降低患者耗氧,降低应激反应,为术后恢复赢得一定时间。本研究中,两组患者不良反应无明显差异,提示丙泊酚用于麻醉诱导可在一定程度上保护脑组织。

本研究中,两组患者术后 HR、MAP、SBP 及 DBP 水平明显下降,且观察组低于对照组。分析其原因可能是因为患者手术时间较长,表现出对手术刺激明感,导致平均动脉压升高、心率加快等,而丙泊酚是一种降低血管阻力的新型短程静脉麻醉药,使术中各生理指标保持平稳^[21]。有研究显示丙泊酚可控制患者术后疼痛,降低患者因疼痛引起的应激反应^[22,23]。

研究显示颅脑手术会进一步加重患者炎症反应,使其颅内压增高,造成颅脑低氧,加重颅脑损伤^[25]。因此,减少颅脑损伤患者炎症反应对颅脑损伤的救治具有重要意义。CRP 是机体急性期合成的一种反应蛋白,正常情况下其含量较低,在组织损伤 6~12h 后机体的炎性系统则被激活,而在短暂迅速的创伤应激后,全身炎症反应可导致 CRP 升高,数天后恢复正常^[26,27]。在颅脑创伤早期,神经损伤会促进肝合成 CRP,此时 CRP 对损伤的脑组织起到保护作用,但由于炎症加重,加剧组织缺血缺氧,其表达进一步上升,可能导致神经细胞的炎性损害,促进颅脑损伤患者病情恶化^[28-30]。PCT 是降钙素的前肽物质,在生理状态下由甲状腺滤泡旁细胞产生,在健康人群的血液中含量极微,但在感染及全身炎症反应综合征等情况下会显著升高^[31-33],通常在 2~6h 增高,且随着感染程度加重,是炎症的早期标志物^[34]。研究显示 PCT 可随着颅内炎症反应严重性而增高,且检测不受临床用药的影响^[35]。本研究结果显示术中两组患者血清 CRP、PCT 明显下降,且使用丙泊酚的患者 CRP、PCT 水平低于对照组,提示丙泊酚可通过降低血清 CRP、PCT 水平,减轻颅脑损伤患者炎症反应。分析其原因可能是因为丙泊酚在麻醉过程中能够抑制脑缺血缺氧引起的氧自由基,减少细胞膜损伤,阻止血管源性脑水肿的产生,减轻缺血缺氧后神经元的损伤,从而抑制炎症反应。

综上所述,丙泊酚可降低颅脑损伤手术患者术中血清 CRP、PCT 水平,稳定血流动力学,并发挥术后镇痛作用。

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