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利多卡因经气管内给药和静脉给药对全麻苏醒期患者镇静镇痛效果、血流动力学和呛咳反应的影响*

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摘要 目的:探讨利多卡因经气管内给药和静脉给药对全麻苏醒期患者镇静镇痛效果、血流动力学和呛咳反应的影响。**方法:**选取2018年3月~2019年8月于我院在气管内全麻下完成泌尿外科、腹部外科并预计于术后可以迅速拔除气管导管的患者63例,上述患者根据随机数字表法分为A组(n=31)和B组(n=32),A组患者给予利多卡因静脉给药,B组患者给予利多卡因经气管内给药,比较两组患者苏醒时间、拔管时间、镇静镇痛效果、血流动力学及呛咳反应。**结果:**两组苏醒时间、拔管时间组间比较差异无统计学意义($P>0.05$)。两组插管时、拔管时、拔管后10 min心率(HR)、收缩压(SBP)、舒张压(DBP)均呈先升高后降低趋势,且B组插管时、拔管时、拔管后10 min的HR、SBP、DBP均低于A组($P<0.05$)。两组拔管时、拔管后10 min组内及组间镇静-躁动评分(SAS)比较差异无统计学意义($P>0.05$);两组拔管后10 min疼痛视觉模拟量表(VAS)评分高于拔管时,但B组低于A组($P<0.05$)。B组患者插管时、拔管时呛咳反应发生率均低于A组($P<0.05$)。**结论:**与静脉给药相比,全麻苏醒期患者给予利多卡因经气管内给药,镇静镇痛效果确切,可减轻血流波动,降低插管时、拔管时呛咳反应发生率。

关键词:利多卡因;全麻苏醒期;镇静;镇痛;血流动力学;呛咳反应

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Effects of Lidocaine on Sedation, Analgesia, Hemodynamics and Cough Response in Patients Undergoing General Anesthesia*

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ABSTRACT Objective: To investigate the effects of lidocaine on sedation and analgesia, hemodynamics and cough response in patients with general anesthesia during the recovery period. **Methods:** From March 2018 to August 2019, 63 patients who had completed urology and abdominal surgery under endotracheal general anesthesia in our hospital and were expected to have tracheal catheters removed quickly after surgery were selected. The above patients were divided into group A (n = 31) and group B (n = 32) according to the random number table. Group A patients were given lidocaine intravenously, and group B patients were given lidocaine intratracheal. The recovery time, extubation time, sedation and analgesia effect, hemodynamics and cough response of the two groups were compared. **Results:** There were no significant difference in recovery time and extubation time between the two groups ($P>0.05$). Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP) increased first and then decreased in the two groups during intubation, extubation and 10 minutes after extubation, and HR, SBP and DBP in group B at during intubation, extubation and 10 minutes after extubation were lower than those in group A ($P<0.05$). There was no significant difference in Sedation agitation score (SAS) between the two groups at the time of extubation and 10 minutes after extubation ($P>0.05$). Visual analogue scale (VAS) score of pain 10 min after extubation was higher than that of extubation in the two groups, but that in group B was lower than that in group A ($P<0.05$). The incidence of cough reaction during intubation and extubation in group B during intubation, extubation were lower than those in group A ($P<0.05$). **Conclusion:** Compared with intravenous administration, the administration of lidocaine in the wake period of general anesthesia has a definite sedative and analgesic effect, which can reduce the fluctuation of blood flow and reduce the incidence of choking reaction during intubation and extubation.

Key words: Lidocaine; General anesthesia recovery period; Sedation; Analgesia; Hemodynamics; Cough response

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前言

全麻后苏醒期,由于气管导管的咽喉部刺激以及吸痰等可导致患者出现一系列血流波动,同时伴有血压增高、呛咳、喉痉

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挛、心率增快等并发症,严重时危及患者生命^[1,2]。此时临床通常会给予相应的镇静、镇痛药物以减轻上述反应,利多卡因是局部麻醉及抗心律失常药,疗效确切^[3,4]。但利多卡因对心血管系统也有一定的不良反应,比如呼吸抑制、苏醒延迟、循环抑制等^[5,6]。临床上应用利多卡因的方法有气管内喷雾、缓慢静脉注射并术中维持等,然而有关上述两种方式对全麻苏醒期患者的影响尚存在一定争议^[7,8]。鉴于此,本研究通过探讨利多卡因经气管内给药和静脉给药对全麻苏醒期患者镇静镇痛效果、血流动力学和呛咳反应的影响,以期临床方案选择提供参考。

1 资料与方法

1.1 一般资料

选取 2018 年 3 月~2019 年 8 月于我院在气管内全麻下完成泌尿外科、腹部外科并预计于术后可以迅速拔除气管导管的患者 63 例,纳入标准:(1)均符合手术指征者;(2)美国麻醉医师协会(American Society of Anesthesiologists, ASA)^[9]分级 I~II 级者;(3)年龄 18~69 岁;(4)对本次研究用药无禁忌者;(5)签署知情同意书。排除标准:(1)合并心、肝、脑、肾、肺等重要脏器严重病变者;(2)合并精神疾患无法正常交流者;(3)存在慢性疼痛,既往有药物滥用史者;(4)既往有呼吸道疾病、免疫缺陷、感染性疾病者;(5)合并心血管系统疾病及用药史者。根据随机数字表法分为 A 组(n=31)和 B 组(n=32),其中 A 组男 18 例,女 13 例,年龄 18~69 岁,平均(38.48±6.31)岁;ASA 分级 I 级者 14 例,II 级者 17 例;体重指数 21~26kg/m²,平均(23.48±0.79)kg/m²。B 组男 16 例,女 16 例,年龄 19~66 岁,平均(39.72±7.48)岁;ASA 分级 I 级者 17 例,II 级者 15 例;体重指数 22~26kg/m²,平均(23.61±0.94)kg/m²。两组患者一般资料对比组间未见统计学差异($P>0.05$),具有可比性。此次研究已通过我院伦理学委员会批准。

1.2 方法

两组患者麻醉前 30 min 肌注阿托品(国药准字 H44025273,广东南国药业有限公司,规格:2 mL)0.5 mg,鲁米那(国药准字 H14022787,山西国润制药有限公司,规格:2 mL:复方)0.1 g,入室后开放静脉通路,常规监测患者收缩压(Systolic blood pressure, SBP)、心率(Heart rate, HR)、舒张压(Diastolic blood pressure, DBP),麻醉诱导:依次静脉注射咪达

唑仑(国药准字 H20067040,宜昌人福药业有限责任公司,规格:2 mL:2 mg)0.03 mg/kg,瑞芬太尼(国药准字 H20143315,江苏恩华药业股份有限公司,规格:2 mg)3 μ g/kg,维库溴铵(国药准字 H20066941,扬子江药业集团有限公司,规格:4 mg)0.1 mg/kg,丙泊酚(国药准字 H20143369,广东嘉博制药有限公司,规格:50 mL:1 g)1 mg/kg,诱导成功后气管插管,连接麻醉机,维持二氧化碳分压 35~45 mmHg,潮气量为 6~8 mL/kg。术中靶控输注丙泊酚 2.5~3.5 ng/mL,吸入 1%~2%异氟醚;间断静脉追加维库溴铵、瑞芬太尼;术毕缝合皮肤时,吸入大量氧气进行气道冲洗。A 组插管前及拔管前 5 min 左右按 1.5 mg/kg 标准缓慢滴注 2%利多卡因(国药准字 H20059924,海南天煌制药有限公司,规格:5 mL:86.5 mg),B 组插管前及拔管前 5 min 左右按 1.5 mg/kg 标准经气管导管注入 2%利多卡因。

1.3 观察指标

(1)记录两组苏醒时间及拔管时间。(2)记录两组诱导前、插管时、拔管时、拔管后 10 min 的 HR、SBP、DBP 变化情况。(3)记录两组患者插管时、拔管时的呛咳反应情况。(4)采用镇静-躁动评分(Sedation agitation score, SAS)^[10]、疼痛视觉模拟量表(Visual analogue scale, VAS)^[11]评价两组患者拔管时、拔管后 10 min 的镇静、镇痛效果。其中 VAS 评分 0~10 分,10 分表示难以忍受之痛,0 分表示无痛,分数越高,疼痛感越强烈。SAS 评分为 1~7 级评分法,其中 1 分:不能唤醒,对恶性刺激无或仅有轻微反应;2 分:非常镇静,对躯体刺激有反应;3 分:镇静,嗜睡,语言刺激或轻轻摇动可唤醒;4 分:安静合作,服从命令。5 分:躁动,身体焦虑。6 分:非常躁动,需要保护束缚并反复语言提醒;7 分:危险躁动,试图拔除各种导管,攻击医护人员。

1.4 统计学方法

使用 SPSS25.0 软件进行统计学分析,计量资料以($\bar{x}\pm s$)表示,比较实施 t 检验,计数资料以比或率表示,实施卡方检验,检验水准为 $\alpha=0.05$ 。

2 结果

2.1 苏醒时间及拔管时间比较

两组苏醒时间、拔管时间组间比较无差异($P>0.05$);详见表 1。

表 1 苏醒时间及拔管时间比较($\bar{x}\pm s$, min)

Table 1 Comparison of recovery time and extubation time($\bar{x}\pm s$, min)

Groups	Recovery time	Extubation time
Group A(n=31)	32.53±3.32	42.36±4.26
Group B(n=32)	33.26±4.01	42.64±4.87
t	0.786	0.243
P	0.435	0.839

2.2 血流动力学指标比较

两组诱导前 HR、SBP、DBP 比较无差异($P>0.05$);两组插管时、拔管时、拔管后 10 min 的 HR、SBP、DBP 均呈先升高后降低趋势,B 组插管时、拔管时、拔管后 10 min HR、SBP、DBP

均低于 A 组($P<0.05$);详见表 2。

2.3 两组 SAS、VAS 评分比较

拔管时两组 SAS、VAS 评分比较无差异($P>0.05$);两组拔管时、拔管后 10 min 组内及组间 SAS 比较差异无统计学意义

($P>0.05$);两组拔管后 10 min VAS 评分高于拔管时,但 B 组低于 A 组($P<0.05$);详见表 3。

表 2 血流动力学指标比较($\bar{x}\pm s$)
Table 2 Comparison of hemodynamic indexes($\bar{x}\pm s$)

Groups	Time	HR(n/min)	DBP(mmHg)	SBP(mmHg)
Group A(n=31)	Before induction	79.82±6.78	78.34±6.54	94.18±6.55
	Intubation time	95.74±7.65 ^a	92.38±5.23 ^a	109.45±7.26 ^a
	Extubation time	89.95±6.86 ^{ab}	87.66±6.74 ^{ab}	104.78±6.78 ^{ab}
	10 min after unplugging	85.86±7.61 ^{abc}	83.93±5.52 ^{abc}	99.06±6.39 ^{abc}
Group B(n=32)	Before induction	80.01±7.53	76.82±7.62	94.24±6.42
	Intubation time	89.15±6.69 ^{ad}	86.91±6.68 ^{ad}	104.19±7.53 ^{ad}
	Extubation time	85.31±7.37 ^{abd}	82.03±7.74 ^{abd}	99.70±6.83 ^{abd}
	10 min after extubation	81.44±6.28 ^{bcd}	77.22±6.82 ^{bcd}	95.18±7.91 ^{bcd}

表 3 两组 SAS、VAS 评分比较($\bar{x}\pm s$, 分)
Table 3 Comparison of SAS and VAS scores between the two groups($\bar{x}\pm s$, score)

Groups	SAS		VAS	
	Extubation time	10 min after extubation	Extubation time	10 min after extubation
Group A(n=31)	4.13±0.42	4.26±0.35	1.29±0.24	3.36±0.32 ^a
Group B(n=32)	4.08±0.51	4.32±0.41	1.36±0.28	2.13±0.36 ^a
t	0.424	0.624	1.064	14.317
P	0.673	0.535	0.292	0.000

2.4 呛咳反应发生情况比较 ($P<0.05$);详见表 4。

B 组患者插管时、拔管时呛咳反应发生率均低于 A 组

表 4 两组患者呛咳反应发生情况比较 例(%)
Table 4 Comparison of choking and cough response between the two groups n(%)

Groups	n	Intubation time	Extubation time
Group A	31	6(19.35)	9(29.03)
Group B	32	1(3.13)	3(9.38)
χ^2	-	4.209	3.952
P	-	0.040	0.047

3 讨论

咽喉和气管有丰富的神经分布,而在全麻手术期间,患者的气道保护反射减弱,故对疼痛的感受较为轻微,而当手术结束时,麻醉药物停止使用,吸痰、气管导管的不良刺激可激活机体交感肾上腺系统,致使缩血管物质释放增加,患者血压升高,HR 加快^[12-14]。同时麻醉药物药效过后,患者的气道保护反射逐渐恢复,可感受到较为强烈的疼痛,同样可引起患者血流动力学紊乱,此类血流动力学的短暂波动也许对心功能正常的患者影响不大,但是针对部分心脑血管功能退化的患者却是非常危险的因素^[15-17]。因此,抑制全麻苏醒期患者的呛咳反应、血流波动是临床麻醉师必须掌握的技能。利多卡因是一种酰胺类局麻药,其在麻醉方案中的抗应激反应预防作用已得到不少临床实践的证实^[18,19]。其给药方式主要由两种,分别是静脉给药与经气管内给药,但有关其最佳的给药方式尚存在一定争议。静脉给

药抑制中枢脑干网状结构的心血管中枢,间接抑制气管黏膜表面丰富的神经丛传递活动^[20,21]。经气管内给药可直接抑制气管黏膜表面丰富的神经丛,从源头上抑制患者的应激反应^[22],但也有学者认为经气道给予利多卡因,其血药浓度的变化依赖于药物的弥散及剂量,达到有效血药浓度较慢,进而影响治疗效果^[23],鉴于此,本研究就此展开分析。

本次研究结果显示,两组苏醒时间、拔管时间、SAS 比较未见差异,可见经气管内给药或者经静脉给药,均可获得较好的镇静效果,对患者苏醒时间、拔管时间均未见显著影响。利多卡因进入人体后可通过兴奋脊髓及脑干中的甘氨酸受体,抑制钠通道,以及抑制 N-甲基-D 天冬氨酸、G 蛋白耦联受体,进而减少组织缺血引起的炎症应答反应等发挥较好的镇静镇痛作用^[24,25]。本研究中两组患者插管时、拔管时、拔管后 10 min 均有一定的血流波动,但 B 组患者的血流波动明显更轻,提示与静脉给药相比,全麻苏醒期患者给予利多卡因经气管内给药,可

较好的维持血流平稳。由于利多卡因的吸收速率不仅与气管表面积有关,还与雾粒大小是否达到细支气管或肺泡内有关,经气管内给药后,药物的吸收面积更为广泛,可加速药物吸收,且利多卡因直接作用于气管黏膜表面丰富的神经丛,起效更为迅速,可更好的抑制患者的应激反应^[26-28]。B组的镇痛作用优于A组也可能是与经气管给药可减轻机体应激反应,减少疼痛递质的传递有关^[29]。此外,本研究中B组患者插管时、拔管时呛咳反应发生率均低于A组,这主要是因为利多卡因经气管导管给药后,气管等呼吸道多部位粘膜均会产生麻醉效果,对产生呛咳应激反应各种感受器的反射弧起始点及时阻断,从而有效抑制呛咳反应^[30]。此外,本研究尚存在样本量偏小、未能观察利多卡因的最佳用药剂量等不足,后续将进一步深入报道。

综上所述,与静脉给药相比,全麻苏醒期患者给予利多卡因经气管内给药,镇静镇痛效果确切,可减轻血流波动,降低插管时、拔管时呛咳反应发生率。

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