

doi: 10.13241/j.cnki.pmb.2019.21.036

右美托咪定联合氯胺酮与咪达唑仑麻醉诱导用于困难气道插管中的价值分析*

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摘要 目的:探讨右美托咪定联合氯胺酮与咪达唑仑麻醉诱导在困难气道插管中的应用价值。**方法:**选取2016年1月至2018年10月我院收治的80例困难气道患者进行回顾性研究,根据插管顺序将受试者分为对照组和研究组两组,每组40例。对照组患者给予氯胺酮与咪达唑仑进行麻醉诱导,研究组患者在对照组的基础上联合右美托咪定进行麻醉诱导。比较两组麻醉前(T1)、纤支镜经过会厌时(T2)、声门时(T3)、插管即刻(T4)、插管后60 s(T5)、插管后180 s(T6)、插管后300 s(T7)时的平均动脉压(mean arterial pressure, MAP)、心率(Heart rate, HR)、血氧饱和度(Blood oxygen saturation, SpO₂)及 Ramsay 评分变化,并监测 T1、T4 及 T6 时间点去甲肾上腺素(Norepinephrine, NE)、肾上腺素(epinephrine, E)及皮质醇(Cortisol, Cor)水平及不良反应的发生情况。**结果:**两组不同时间点 SpO₂ 比较无统计学差异($P>0.05$),但研究组患者在 T3-T7 时间点的 MAP、HR 显著低于对照组, Ramsay 评分显著高于对照组($P<0.05$)。两组患者 T1 时的 NE、E 及 Cor 水平比较无统计学差异($P>0.05$),但研究组 T4 及 T6 时 NE、E 及 Cor 水平均显著低于对照组($P<0.05$)。研究组患者呛咳、恶心、躁动及呼吸抑制的发生率均显著低于对照组($P<0.05$)。**结论:**与氯胺酮联合咪达唑仑相比,右美托咪定联合氯胺酮与咪达唑仑对心血管系统影响小,安全性更高,患者应激反应较低,在困难气道插管麻醉诱导中具有较高的应用价值。

关键词:右美托咪定;氯胺酮;咪达唑仑;麻醉诱导;困难气道;插管成功率

中图分类号:R614 **文献标识码:**A **文章编号:**1673-6273(2019)21-4161-04

Value Analysis of Dexmedetomidine Combined with Ketamine and Midazolam for Anesthesia Induction in Difficult Airway Intubation*

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ABSTRACT Objective: To explore application value of dexmedetomidine combined with ketamine and midazolam for anesthesia induction in difficult airway intubation. **Methods:** Eighty patients with difficult airway admitted to our hospital from January 2016 to October 2018 were enrolled and retrospectively studied. The subjects were divided into two groups according to the intubation sequence: 40 patients in each group. The control group were given ketamine and midazolam for anesthesia induction, the study group on the basis of this combination of dexmedetomidine for anesthesia induction. The mean arterial pressure (MAP), heart rate (HR), blood oxygen saturation (SpO₂) pre-anesthesia (T1), at bronchoscopy after epiglottis (T2), glottis (T3), intubation immediately (T4), 60 s after intubation (T5), and 180 s after intubation (T6), the Ramsay score at 300 s (T7) after intubation, and the levels of norepinephrine (NE), epinephrine (E), and cortisol (Cortisol, Cor) at T1, T4, and T6 were compared between two groups. **Results:** There was no significant difference in the SpO₂ between the two groups at different time points ($P>0.05$), but the MAP and HR of the study group were significantly lower than those of the control group at the T3-T7 time point, and the Ramsay score was significantly higher than that of the control group($P<0.05$). There was no significant difference in the levels of NE, E and Cor between the two groups at T1 ($P>0.05$), but the levels of NE, E and Cor in the study group were significantly lower than those in the control group at T4 and T6 ($P<0.05$). The incidence of cough, nausea, agitation and respiratory depression in the study group were significantly lower than those in the control group ($P<0.05$). **Conclusion:** Compared with ketamine combined with midazolam, dexmedetomidine combined with ketamine and midazolam had less impact on the cardiovascular system, higher safety, lower stress response and adverse reactions in patients with difficult airway intubation. It may have high application value in the anesthesia induction.

Key words: Dexmedetomidine; Ketamine; Midazolam; Anesthesia induction; Difficult airway; Intubation success rate

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

Article ID: 1673-6273(2019)21-4161-04

* 基金项目:陕西省科学技术研究发展计划项目(2016SF-075)

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(收稿日期:2019-04-03 接受日期:2019-04-28)

前言

困难气道患者常伴有先天性咽腔狭窄、颈部或舌体粗大等,当进行气管插管后,机体常因强烈的应激反应而导致气管壁损伤,在插管前实施麻醉诱导是保证插管效果的关键^[1,2]。纤维支气管镜气管插管是临床解决困难气管插管的首选方案,以往麻醉医师常利用氯胺酮、咪达唑仑等麻醉药物降低外源性刺激诱发的交感神经兴奋性,达到镇静镇痛的效果,但临床实践常会产生不同程度的呼吸抑制、循环障碍等不良事件,增加麻醉风险^[3]。

右美托咪定作为一种高选择性的 α_2 肾上腺素受体激动剂,不仅具有抑制呼吸、镇静镇痛的作用,且可稳定血流动力学指标,减少机体应激反应,提高患者的舒适度,对提高插管成功率及麻醉安全性具有积极意义^[4-6]。因此,本研究选取2016年1月至2018年10月我院80例困难气道患者并进行回顾性研究,探讨右美托咪定联合氯胺酮与咪达唑仑麻醉诱导在困难气道插管中的应用价值,以期临床提供参考,现将研究结果进行如下报道。

1 资料与方法

1.1 一般资料

选取我院80例困难气道患者进行回顾性研究,根据插管顺序将受试者分为对照组和研究组两组,每组40例。对照组中,男22例,女18例,年龄23-71岁,平均(45.86 $\pm$ 3.64)岁;体重46-76 kg,平均(60.14 $\pm$ 4.32) kg,美国麻醉师协会(American society of anesthesiologists,ASA)分级:II级23例,III级17例;研究组中,男23例,女17例,年龄25-69岁,平均(46.02 $\pm$ 3.53)岁;体重45-74 kg,平均(58.96 $\pm$ 4.28) kg,ASA分级:II级21例,III级19例。两组一般资料比较差异均无统计学意义($P>0.05$),具有可比性。

1.2 纳入及排除标准

所有患者均确诊为困难气道,符合纤维支气管镜插管术指征,ASA分级为II-III级,患者知情同意,排除神经疾病、内分泌

系统疾病、严重的心血管疾病、凝血功能障碍、相关药物过敏史、鼻腔炎症及插管禁忌症者。

1.3 麻醉方法

对照组患者在插管前5 min给予1 mg/kg氯胺酮注射液(浙江九旭药业有限公司,国药准字H20023609,规格10 mL:0.1 g)与30 μ g/kg咪达唑仑注射液(江苏恩华药业股份有限公司,国药准字H20143222,规格:10 mL:50 mg)进行麻醉诱导,持续泵入时间在10 min以上;研究组患者在对照组的基础上于插管前10 min持续静脉泵入1 μ g/kg右美托咪定(江苏恩华药业股份有限公司,国药准字H20110085,规格2 mL:0.2 mg)进行麻醉诱导,之后所有患者均于纤维支气管镜引导下经鼻气管插管,采用石蜡油对纤维支气管镜及气管导管表面进行润滑后沿一侧鼻腔垂直插入,通过调整插入角度依次经过会厌、声门,将纤维支气管镜插入支气管上1/3处并插入气管导管后退出纤维支气管镜,3 min后行机械通气,并给予丙泊酚、维库溴铵、芬太尼持续泵入进行维持麻醉。

1.4 观察指标

记录麻醉前(T1)、纤支镜经过会厌时(T2)、声门时(T3)、插管即刻(T4)、插管后60s(T5)、插管后180s(T6)、插管后300s(T7)时的MAP、HR、SpO₂及Ramsay评分,并监测T1、T4及T6时间点两组患者去NE、E及Cor水平以评价机体的应激反应情况,比较两组患者的不良反应的发生情况。

1.5 统计学方法

数据采用SPSS19.0进行统计学分析,计量资料采用均数 $\pm$ 标准差($\bar{x} \pm s$)表示,计数资料采用百分比(%)表示,组间比较分别行t检验及 χ^2 检验, $P<0.05$ 表示差异有统计学意义。

2 结果

2.1 两组不同时间点各循环指标及Ramsay评比较

两组不同时间点SpO₂比较均无统计学差异($P>0.05$),但研究组患者在T3-T7时间点的MAP、HR均显著低于对照组,Ramsay评分显著高于对照组($P<0.05$),见表1。

表1 两组不同时间点各循环指标及Ramsay评分比较($\bar{x} \pm s$)

Table 1 Comparison of the cycle index and Ramsay score at different time points between two groups($\bar{x} \pm s$)

Groups	Observed indicator	T1	T2	T3	T4	T5	T6	T7
Study Group (n=40)	MAP(mmHg)	87.72 $\pm$ 8.86	80.13 $\pm$ 6.92	82.46 $\pm$ 7.02*	85.33 $\pm$ 7.34*	86.15 $\pm$ 8.54*	83.02 $\pm$ 7.79*	78.59 $\pm$ 6.78*
	HR(time/min)	78.38 $\pm$ 8.57	70.05 $\pm$ 7.18*	68.31 $\pm$ 6.47*	69.72 $\pm$ 9.68*	70.08 $\pm$ 8.47*	67.49 $\pm$ 8.88*	67.02 $\pm$ 7.48*
	SpO ₂ (%)	98.18 $\pm$ 1.69	98.03 $\pm$ 1.28	98.11 $\pm$ 1.01	97.98 $\pm$ 1.22	98.96 $\pm$ 0.98	99.01 $\pm$ 0.49	99.12 $\pm$ 0.68
	Ramsay(score)	2.79 $\pm$ 0.31	2.71 $\pm$ 0.39	2.80 $\pm$ 0.48*	2.89 $\pm$ 0.61*	2.79 $\pm$ 0.52*	2.81 $\pm$ 0.58*	2.80 $\pm$ 0.72*
Control group (n=40)	MAP(mmHg)	88.42 $\pm$ 8.98	81.37 $\pm$ 7.55	93.52 $\pm$ 9.62	98.69 $\pm$ 10.85	99.02 $\pm$ 11.35	96.48 $\pm$ 10.41	93.68 $\pm$ 12.74
	HR(time/min)	78.04 $\pm$ 9.95	73.19 $\pm$ 8.57	88.59 $\pm$ 8.97	93.26 $\pm$ 11.85	92.68 $\pm$ 10.94	87.63 $\pm$ 9.49	85.38 $\pm$ 9.94
	SpO ₂ (%)	98.62 $\pm$ 1.79	98.03 $\pm$ 1.65	98.28 $\pm$ 1.09	98.11 $\pm$ 1.29	98.68 $\pm$ 1.52	98.72 $\pm$ 0.79	99.02 $\pm$ 0.78
	Ramsay(score)	2.73 $\pm$ 0.25	2.65 $\pm$ 0.38	1.59 $\pm$ 0.41	1.60 $\pm$ 0.58	1.68 $\pm$ 0.59	1.81 $\pm$ 0.59	1.91 $\pm$ 0.62

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

2.2 两组不同时间点应激激素水平的比较

T1时,两组患者的NE、E及Cor水平比较无统计学差异

($P>0.05$),但在T4及T6时,研究组NE、E及Cor水平均显著低于对照组($P<0.05$),见表2。

表 2 两组不同时间点应激激素水平的比较($\bar{x} \pm s$)Table 2 Comparison of the stress hormones at different time points between two groups($\bar{x} \pm s$)

Groups	Index	T1	T4	T6
Study Group(n=40)	NE(nmol/L)	0.29± 0.12	0.29± 0.13*	0.25± 0.12*
	E(pmol/L)	2.31± 0.15	2.89± 0.14*	2.82± 0.18*
	Cor(nmol/L)	378.76± 72.58	383.52± 75.42*	384.65± 80.24*
Control group(n=40)	NE(nmol/L)	0.28± 0.11	0.46± 0.16	0.35± 0.14
	E(pmol/L)	2.29± 0.14	3.60± 0.18	3.19± 0.15
	Cor(nmol/L)	376.58± 72.16	678.95± 118.34	476.58± 97.86

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

2.3 两组不良反应发生情况的比较

低于对照组($P < 0.05$),见表 3。

研究组患者呛咳、恶心、躁动及呼吸抑制的发生率均显著

表 3 两组不良反应发生情况的比较[例(%)]

Table 3 Comparison of the incidence of adverse reactions between two groups[n(%)]

Groups	Number	Bucking	Nausea	Dysphoria	Respiratory depression
Study Group	40	1(2.50)	1(2.50)		
Control group	40	7(17.50)	6(15.00)	4(10.00)	4(10.00)
χ^2		5.000	3.914	4.211	4.211
P		<0.05	<0.05	<0.05	<0.05

3 讨论

纤维支气管镜气管插管是解决困难气道患者通气功能的首选方法,但患者气道情况复杂,插管期间易损伤气道黏膜,加之麻药刺激及患者的不适感常会增加机体的应激反应,进而影响血压、心率等指标,导致插管失败^[7-9]。有研究表明外源性及内源性刺激可促进中枢神经分泌 NE,进而诱导肾上腺皮质束状带分泌 Cor,使外周静脉血中 NE、E 及 Cor 水平升高,进而导致血压升高、心率加快^[10-14]。另外,促兴奋激素高表达是纤维支气管镜气管插管术后出现不良反应的基础,而神经兴奋后可促进促激素释放激素的分泌、脑垂体及腺垂体合成、增加儿茶酚胺类物质对机体的刺激而导致应激反应的发生^[15-18]。

氯胺酮具有高度亲脂性,静脉泵入后可迅速进入中枢神经,选择性抑制丘脑内侧核,减弱脊髓网状结构束的上行传导,从而发挥镇痛作用^[19]。但氯胺酮可抑制呼吸,甚至使呼吸停止^[20]。咪达唑仑具有苯二氮类药理活性,静脉注射后可使患者产生短暂的顺行性记忆缺失,具有起效快、作用时间短、镇静催眠效果好的特点,与氯胺酮联合应用可协同性发挥镇静镇痛效果,抑制神经兴奋性,进而减弱机体的应激反应,但咪达唑仑具有轻微的呼吸抑制作用,不利于稳定血流动力学指标^[21-24]。右美托咪定是一种选择性 α_2 -肾上腺素受体激动剂,可有效抑制交感神经活性,稳定血压、心率等生命体征,有利于减少不良心血管事件的发生风险,镇静镇痛效果显著,且能有效避免及减少插管期间机体的应激反应^[25-27]。

本研究结果显示研究组患者在 T3-T7 时间点的 MAP、HR 显著低于对照组,Ramsay 评分显著高于对照组,提示两组麻醉诱导药物对患者的呼吸功能无明显影响,但在 T3-T7 时间点联

合应用右美托咪定可有效抑制交感神经活性,稳定血流动力学指标,镇痛镇静效果更高^[28,29]。此外,研究组 T4 及 T6 时 NE、E 及 Cor 水平均显著低于对照组,可能是因为右美托咪定可更好的抑制机体的应激反应。研究组患者呛咳、恶心、躁动及呼吸抑制的发生率均显著低于对照组,提示右美托咪定可有效抑制氯胺酮与咪达唑仑所致的不良反应,减少对心血管系统的干扰,缓解机体应激反应,更有利于保证麻醉安全^[30]。

综上所述,与氯胺酮联合咪达唑仑相比,右美托咪定联合氯胺酮与咪达唑仑对心血管系统的影响小,安全性较高,在困难气道插管麻醉诱导中具有较好的应用价值。

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