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喉上神经阻滞复合瑞芬太尼和右美托咪定用于经皮气管切开术的临床效果

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摘要 目的:探讨喉上神经阻滞复合瑞芬太尼和右美托咪定应用于经皮气管切开术(PT)的临床效果。**方法:**将 60 例因呼吸困难行 PT 的患者随机分为两组。所有患者均喉上神经阻滞,对照组(30 例)采用丙泊酚复合瑞芬太尼,实验组(30 例)采用右美托咪定复合瑞芬太尼。观察并比较两组患者术前(T1)、麻醉药物注射结束后(T2)、气管切开置入套管时(T3)、手术结束时(T4)收缩压(SBP)、舒张压(DBP)、心率(HR)、血氧饱和度(SpO₂)及平均动脉压(MAP)、警觉/镇静(OAA/S)评分的变化及术中并发症的发生情况。**结果:**对照组 T3、T4 时刻 SBP、DBP、HR、MAP 均较 T1 时明显升高,且明显高于实验组同时点($P<0.05$),而实验组 T2、T3、T4 时 SBP、DBP、HR、MAP 与 T1 时刻比较差异无明显统计学意义($P>0.05$)。实验组术中呛咳、呼吸抑制的发生率显著低于对照组($P<0.05$)。两组 T2~T4 时刻 OAA/S 评分均明显低于 T1 时刻,且实验组 OAA/S 评分均明显低于对照组同时刻($P<0.05$)。**结论:**喉上神经阻滞复合右美托咪定和瑞芬太尼应用于 PT 中可维持血流动力学的稳定,减少应激反应,降低术中并发症的发生率。

关键词:经皮气管切开;喉上神经阻滞;瑞芬太尼;右美托咪定

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Efficacy of Superior Laryngeal Nerve Block Combined with Dexmedetomidine and Remifentanyl for Percutaneous Tracheostomy

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ABSTRACT Objective: To explore the clinical effect of superior laryngeal nerve block combined with dexmedetomidine and remifentanyl for percutaneous tracheostomy (PT). **Methods:** 60 patients were scheduled for PT because of difficult breathing were randomly divided into two groups. All patients were performed by laryngeal nerve block, control group (n=30) was given with propofol combined with remifentanyl, experimental group (n=30) was given with dexmedetomidine and remifentanyl. The systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), blood oxygen saturation (SpO₂) and mean arterial pressure (MAP) before operation(T1), after anesthetic injection (T2), tracheal incision and tracheostomy cannula placement (T3), at the end of the operation (T4) between two groups were compared, and the intraoperative complications and observers assessment of alertness/sedation scale (OAA/S) score were observed and analyzed. **Results:** Compared with those at T1, the level of SBP, DBP, HR and MAP at T3, T4 in the control group were significantly elevated and higher than those in the experimental group ($P<0.05$), while there was no significant difference among T1 T2, T3, T4 in experimental group ($P>0.05$). The incidence of intraoperative bucking, respiratory depression in experimental group was significantly lower than that in the control group ($P<0.05$). The OAA/S score at T2, T3, T4 in both groups were significantly reduced compared with those at T1, and experimental group had lower OAA/S score than that of the control group at the same time point ($P<0.05$). **Conclusions:** Superior laryngeal nerve block combined with dexmedetomidine and remifentanyl can maintain the hemodynamic stability, reduce the stress response and the incidence of intraoperative complications for PT.

Key words: Percutaneous tracheostomy; Superior laryngeal nerve block; Remifentanyl; Dexmedetomidine

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前言

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气管切开术是解除患者呼吸困难、保障呼吸道通畅的一种常见手术,适用于脑外科术后患者等需要长期呼吸机支持的患者。其中,经皮气管切开术(PT)以其操作方便、出血少以及经济实惠等优势在临床得到广泛的应用,占有气管切开术的 90% 以上^[1-4]。目前,PT 术中多采取局部麻醉,但其易影响患者血流动力学的稳定,还可能导致剧烈的呛咳反应^[5-7]。如何在不影响呼吸的前提下,有效抑制机体的应激反应并保证足够的麻醉深度和良好的镇痛效果一直是临床研究的难题^[8-10]。本研究拟在

PT 术中采用喉上神经阻滞复合瑞芬太尼和右美托咪啶,探讨其对患者血流动力学及术中应激反应的影响,现报道如下。

1 资料与方法

1.1 一般资料

选择 2014 年 1 月~2017 年 6 月我院重症监护病房收治的神经外科术后拟行 PT 手术的患者,共 60 例。入组标准:(1)脑外科术后气道呼吸困难,需进行长期机械通气的患者;(2)年龄 ≥ 18 岁;(3)排除长期接受镇痛、镇静药物治疗史的患者,以及严重心血管、呼吸系统疾病及肝肾功能不全者。其中男 36 例,女 24 例;年龄 45~79 岁,平均(57.8 ± 5.6)岁;美国麻醉医师协会(ASA)分级 I-II 级。按照随机数字表法,将 60 例患者分为对照组和实验组,每组各 30 例。两组患者在年龄、性别构成比、ASA 分级等基本情况比较差异均无统计学意义($P>0.05$)。本研究设计经我院伦理学委员会审查批准,均获得患者或监护人的知情同意。

1.2 方法

术前禁食 10 h 以上,患者气管插管连接呼吸机(DragerEvi-ta2dura) PCSIMV+PSV 模式呼吸支持,调整氧浓度为 100%,连接美国 GE Dash 4000 型多参数监护仪,监测血压、心电图、心率、呼吸频率及血氧饱和度等生命体征。患者取仰卧位,垫高颈部,在甲状软骨与两侧舌骨大角之间注入 1%丁卡因 3 mL 进行喉上神经阻滞,退气管导管至约 18 cm 处,观察二氧化碳波形,保证患者满足正常通气,再向环甲膜穿刺注 2%利多卡因 3 mL 进行气管表面麻醉。实验组:将右美托咪啶(江苏恒瑞医药股份有限公司生产,批准文号:国药准字 H20090248)加入生理盐水稀释成 4 $\mu\text{g/mL}$,以 1 $\mu\text{g/kg}$ 的标准静脉泵入,持续 15 min,同时将瑞芬太尼(宜昌人福药业有限责任公司生产,批准文号:国药准字 H20030197)加入生理盐水稀释成 20 $\mu\text{g/mL}$,以 0.5 $\mu\text{g/kg}$ 的标准静脉泵入,持续 3 min,待麻醉起作用后行 PT。对

照组:给予丙泊酚 1.5 mg/kg 静脉推注,持续 3 min,同时给予瑞芬太尼静脉泵入,用法同实验组,待麻醉起作用后行 PT。

1.3 观察指标

(1)生命体征:监测并记录两组患者术前(T1)、麻醉药物注射结束后(T2)、气管切开置入套管时(T3)、手术结束时(T4)四个不同时刻的收缩压(SBP)、舒张压(DBP)、心率(HR)、血氧饱和度(SpO_2)及平均动脉压(MAP)。(2)术中并发症:记录 PT 术中剧烈呛咳、呼吸抑制($\text{RR}<8$ 次/分或 $\text{SpO}_2<95\%$)及躁动的发生情况。(3)警觉/镇静(OAA/S)评分^[1]:患者均于 T1~T4 时刻进行 OAA/S 评分,评分标准:对正常语调呼名可作出快速反应,计为 5 分;对正常语调呼名仅能冷淡反应,计为 4 分;仅对大声或反复呼名有反应,计为 3 分;仅对轻度推摇头部或肩膀有反应,计为 2 分;对轻度推摇无明显反应,计为 1 分;对挤捏耳垂亦无反应,计 0 分。OAA/S 评分 3~5 分视为意识清楚,1~2 分视为意识丧失。

1.4 统计学分析

本研究数据均采用 SPSS 8.0 版软件包进行统计分析,计数资料以率表示,采用 χ^2 检验比较,计量资料符合正态分布以均数 $\pm$ 标准差($\bar{x} \pm s$)表示,采用独立样本 t 检验比较,以 $P<0.05$ 视为差异有统计学意义。

2 结果

2.1 两组不同时刻的血流动力学指标的比较

T1 时刻,两组 SBP、DBP、HR、MAP 比较差异均无统计学意义($P>0.05$)。对照组 T3、T4 时刻 SBP、DBP、HR、MAP 均较 T1 时明显升高,且均明显高于实验组同时点($P<0.05$),而实验组 T2、T3、T4 时 SBP、DBP、HR、MAP 与 T1 时刻比较差异无统计学意义($P>0.05$);两组各个时刻的 SpO_2 比较差异均无统计学意义($P>0.05$)。见表 1。

表 1 两组患者不同时刻的血流动力学指标比较($\bar{x} \pm s$)

Table 1 Comparison of the haemodynamics at different time points between two groups($\bar{x} \pm s$)

Index	Group	T1	T2	T3	T4
SBP	Experimental group	129.1 $\pm$ 15.1	125.2 $\pm$ 18.2	131.6 $\pm$ 18.8	128.7 $\pm$ 18.4
(mmHg)	Control group	129.4 $\pm$ 15.8	126.1 $\pm$ 17.8	147.4 $\pm$ 16.7**	139.7 $\pm$ 19.2**
DBP	Experimental group	84.8 $\pm$ 12.6	78.2 $\pm$ 13.2	87.7 $\pm$ 12.1	83.7 $\pm$ 10.1
(mmHg)	Control group	83.1 $\pm$ 11.3	80.7 $\pm$ 10.7	96.6 $\pm$ 11.5**	89.4 $\pm$ 12.6**
HR	Experimental group	87.8 $\pm$ 9.5	85.2 $\pm$ 10.4	88.6 $\pm$ 14.7	86.2 $\pm$ 10.5
(次/min)	Control group	85.2 $\pm$ 9.1	82.1 $\pm$ 11.3	92.4 $\pm$ 8.4**	91.1 $\pm$ 8.2**
MAP	Experimental group	91.5 $\pm$ 5.5	89.9 $\pm$ 6.5	91.4 $\pm$ 3.5	90.9 $\pm$ 3.1
(mmHg)	Control group	91.4 $\pm$ 5.3	89.8 $\pm$ 8.6	96.2 $\pm$ 3.7**	95.8 $\pm$ 3.3**
SpO_2	Experimental group	97.7 $\pm$ 1.9	97.2 $\pm$ 1.3	97.5 $\pm$ 1.4	98.1 $\pm$ 1.7
(%)	Control group	97.6 $\pm$ 1.3	98.1 $\pm$ 1.6	97.4 $\pm$ 1.1	97.8 $\pm$ 1.5

Note: Compared with T1, * $P<0.05$, Compared with experimental group, ** $P<0.05$.

2.2 两组术中并发症的发生情况比较

实验组术中呛咳、呼吸抑制的发生率显著低于对照组($P<0.05$),而两组躁动的发生率比较无显著性差异($P>0.05$)。见表 2。

2.3 两组患者不同时刻 OAA/S 评分的比较

实验组 T1、T2 时刻 OAA/S 评分与对照组比较差异均无统计学意义($P>0.05$);两组 T2~T4 时刻 OAA/S 评分均明显低于

T1 时刻, 且实验组 OAA/S 评分均显著低于对照组同时刻, 差异均有统计学意义($P<0.05$)。见表 3。

表 2 两组术中并发症的发生情况比较[例(%)]

Table 2 Comparison of the incidence of intraoperative complications between two groups[n(%)]

Group	N	Intraoperative bucking	Respiratory depression	Dysphoria
Experimental group	30	2(6.7)	0(0)	1(3.3)
Control group	30	8(26.7)	5(16.7)	5(16.7)
P		<0.05	<0.05	>0.05

表 3 两组患者不同时刻 OAA/S 评分比较($\bar{x} \pm s$)

Table 3 Comparison of the OAA/S score at different time points between two groups($\bar{x} \pm s$)

Group	N	T1	T2	T3	T4
Experimental group	30	4.97 $\pm$ 0.05	4.24 $\pm$ 0.31	3.74 $\pm$ 0.41	3.61 $\pm$ 0.22
Control group	30	4.95 $\pm$ 0.03	4.37 $\pm$ 0.34	4.15 $\pm$ 0.43 [°]	3.92 $\pm$ 0.35
P		>0.05	>0.05	<0.05	<0.05

Note: Compared with T1, * $P<0.05$.

3 讨论

颅脑外科患者往往病情危重, 意识障碍多, 造成舌后坠、咳嗽反射减弱或消失, 呼吸道分泌物积聚难以及时排出, 极易引起通气障碍, 从而加重脑组织缺氧, 使病情恶化^[12-15]。因此, 建立有效呼吸通道保证氧供对于此类患者病情控制及预后的改善具有十分重要的意义。气管插管、PT 均可实现快速人工气道建立、有效通气量供给, 但前者对于需要长期机械通气的患者存在一定的局限性, 主要表现在固定困难及口腔护理不便等^[16-18]。因此, 临床工作中更倾向于将 PT 应用于需要长期呼吸机辅助呼吸的脑外科术后重症患者。

PT 手术一般在局麻下进行, 由于术中操作所致不适感以及对手术的恐惧极易造成不良应激反应, 包括剧烈呛咳、躁动、血流动力学波动及心率加快等, 从而增加心脑血管意外的发生风险^[19,20]。临床上, 为了达到足够的麻醉深度, 并保留患者的自主呼吸, 常常通过喉上神经阻滞, 使用药物瑞芬太尼、丙泊酚等联合局麻药物实施适度镇静是目前应用最广泛的方法, 但镇静药物可能对呼吸系统产生一定的抑制作用^[21-23]。喉上神经内支经甲状舌骨膜进入喉部, 分成若干小支直至咽、会厌、梨状隐窝及声门裂以上的喉黏膜, 可支配从会厌到呼吸道远端的黏膜感觉。阻滞喉上神经内支能够实现上述部位喉黏膜的麻醉作用^[24,25]。右美托咪定属于美托咪定的右旋异构体, 是一种强效的肾上腺素受体激动剂, 能够结合并激活 α_2 肾上腺素能受体, 抑制神经元放电, 阻断疼痛信号的传导, 降低神经兴奋性, 达到镇痛的作用。王东昕等^[26]研究表明右美托咪定具有镇静、镇痛及抗焦虑的作用, 不影响机体血流动力学的稳定性, 不会造成呼吸抑制, 有助于改善患者的预后。本研究结果显示实验组在 PT 过程中不同时刻 SBP、DBP、HR、MAP 均保持相对稳定, 而对照组在刺激较为强烈时(T3、T4 时刻)SBP、DBP、HR、MAP 均明显升高, 说明喉上神经阻滞复合瑞芬太尼和右美托咪定能够有效抑制伤害性刺激所致生理应激反应, 维持血流动力学稳定。丛仔红^[27]研究显示喉上神经阻滞能够有效抑制咽喉部反射, 使该部位对气管切开及插管反应的敏感性下降, 复合使用表面麻醉

与镇静剂能够保证患儿在保留自主呼吸以及平稳的生命体征下, 顺利完成气管插管。

本研究结果显示实验组术中呛咳、呼吸抑制的发生率显著低于对照组, 说明右美托咪定在实现良好镇痛的同时对呼吸的影响较为轻微, 安全性更高, 加之本研究是在面罩吸氧的辅助下完成 PT, 患者均未出现缺氧现象。有研究报道显示右美托咪定在血浆中的浓度达到 $8 \mu\text{g} \cdot \text{kg}^{-1}$ 时, 即临床用量的 5~10 倍时, 仍可维持呼吸稳定^[28,29]。虽然本研究中两组躁动的发生率比较无显著性差异, 但从 T2 时刻起, 两组 OAA/S 评分均出现明显下降, 且实验组下降幅度更为明显, 说明适度剂量的右美托咪定可对困难气道患者发挥良好的镇静作用, 有效抑制 PT 期间的应激反应。Liu 等^[30]研究显示右美托咪定与阿片类药物联用可发挥协同作用, 有助于降低术中阿片类药物及其他麻醉药的用量。

综上所述, 喉上神经阻滞复合右美托咪啉和瑞芬太尼应用于 PT 中具有较好的镇痛和镇静作用, 可有效快速地建立患者气道, 维持血流动力学的稳定, 减少机体的应激反应, 安全性更高。

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