

靶控输注全凭静脉麻醉与静吸复合麻醉对术后 认知功能影响的比较

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摘 要【目的】比较靶控输注瑞芬太尼和丙泊酚全凭静脉麻醉与地氟醚和芬太尼静吸复合麻醉对术后认知功能的影响。【方法】选择 ASA -II 级,年龄 18-65 岁(男 27 例,女 17 例)择期行鼻内镜手术的病人 44 例,随机分两组:靶控输注瑞芬太尼加丙泊酚全凭静脉麻醉组(TCI 组)24 例,地氟醚加芬太尼静吸麻醉组(DF 组)20 例。于麻醉诱导前及术后 1、3、24 h 应用 mini-mental state (MMS)测试方法评定其认知功能。比较两组术后麻醉苏醒恢复情况及手术后并发症。【结果】两组病人在相同麻醉深度下,即脑电双频指数(bispectral index ,BIS)术中维持在 40-60,各时间点 MMS 评分组间比较差异无统计学意义($P > 0.05$)。组内比较仅在术后 1 h 均较术前显著降低,术后 3 h 即恢复至术前水平。术后 1 h TCI 组有 6 例(25%)、DF 组有 9 例(42.9%)病人有明显的认知功能降低,术后 3 h DF 组有 2 例(10%)病人的 MMS 值较低(< 28 分),而 TCI 组所有病人认知功能已恢复。TCI 组呼吸恢复时间、听从指令时间及定向力恢复时间均早于 DF 组,差异有统计学意义(P 分别为 0.02、0.03 和 0.02)。拔管时间,呼之睁眼时间也早于 DF 组,但无统计学意义。TCI 组在拔管即刻的 OAA/S 评分高于 DF 组,有统计学意义($P=0.007$)。两组病人术后恶心呕吐发生率无差异,两组均无术中知晓发生。【结论】靶控输注瑞芬太尼和丙泊酚全凭静脉麻醉用于鼻内镜手术可引起一过性术后认知功能障碍,与地氟醚和芬太尼静吸复合麻醉相似。

关键词:认知障碍;靶控输注;瑞芬太尼;丙泊酚

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Comparison of Postoperative Cognitive Function with Target Control Infusion/Total Intravenous Anesthesia and Intravenous-inhalation Combined Anesthesia

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Abstract: 【Objective】To compare postoperative cognitive function with the target-controlled infusion/TIVA anesthesia and intravenous-inhalation combined anesthesia in patients undergoing endoscopic sinus surgery. 【Methods】Forty-four ASA - patients (27 male and 17 female) aged 18-65 years undergoing endoscopic sinus surgery were randomized two groups to receive target-controlled infusion with remifentanyl and propofol (TCI group) or desflurane-fentanyl (DF group). To assess cognitive function before induction and at 1 h, 3 h, and 24 h after operation using Mini-Mental State (MMS) test, and to compare the recovery profiles and postoperative complications between the two groups. 【Results】(1) In the same deep of anesthesia[(bispectral index ,BIS) was 40-60], there were no significant difference in MMS score between the two groups before and after surgery ($P > 0.05$). The MMS scores decreased significantly at only 1 h after surgery compared with those before surgery in both groups, and returned to preoperative baseline levels within 3 h after surgery. The percentage of the patients who developed postoperative cognitive dysfunction (POCD) was 42.9% at 1 h after operation and 10% at 3 h after operation in DF group. In TCI group the percentage of patients who developed POCD was 25% at 1 h after operation. (2) Early recovery times (recovery of spontaneous breathing, response to commands, orientation) was significantly shorter in the TCI group than that in the DF group ($P=0.02, 0.03$ and 0.02). And eye opening and extubation were similar between two groups. (3) OAA/S score (5=fully conscious, 1=deep sleep) was significantly higher at extubation in TCI group than that in DF group. (4) The incidence of postoperative nausea and vomiting was similar in both

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groups. No awareness happened in two groups during operation. 【Conclusion】 Target controlled infusion anesthesia with propofol and remifentanyl may induce temporarily postoperative cognitive dysfunction, and is similar to desflurane-fentanyl anesthesia.

Key words: cognitive dysfunction; target-controlled infusion; remifentanyl; propofol

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由于静脉麻醉药特别是超短效的丙泊酚与瑞芬太尼的靶控输注具有可控性好,用药更为精确,术后苏醒质量高等优点,近年广泛应用于临床。其对术后认知功能的影响尚有争议。本研究旨在比较靶控输注丙泊酚和瑞芬太尼全凭静脉麻醉与地氟醚和芬太尼静吸复合麻醉对术后认知功能恢复的影响。

1 资料和方法

1.1 一般资料

2004年1月至10月我院ASAⅡ~Ⅲ级,慢性鼻窦炎Ⅱ型拟行鼻内镜手术的病人44例,年龄18~65岁,男27例,女17例,无精神、神经疾病史,无酗酒及吸毒史,无长期服用阿片或安定类药物,体质量不超过标准体质量30%,随机分为靶控静脉全凭静脉麻醉组(TCI)24例和静吸复合麻醉组(DF)20例。病人性别,年龄,体质量,麻醉手术时间差异无统计学意义($P > 0.05$,表1)。

表1 病人一般资料

Table 1 Demographic characteristics of patients ($\bar{x} \pm s$)	TCI		P
	TCI	DF	
Gender(m/f)	17/7	10/10	0.158
Age(yr)	41.08 ± 4.61	38.26 ± 4.05	0.466
Height(cm)	167.46 ± 7.48	164.40 ± 6.63	0.978
Body mass(kg)	66.00 ± 4.14	60.65 ± 10.13	0.314
Duration of anesthesia(min)	78 ± 42	70 ± 38	0.876

1.2 麻醉与监测

TCI组:靶控输注瑞芬太尼按病人的体质量设置血浆质量浓度为4~6 ng/mL,清醒时为0.5 ng/mL;靶控输注丙泊酚血浆质量浓度,开始为5 μg/mL,当效应室中质量浓度达到4 μg/mL时,将血浆质量浓度设置调整为4 μg/mL。病人入睡后给肌松剂阿曲库铵0.08 mg/kg,90 s后插入气管导管。DF组:以丙泊酚(propofol)1.5 mg/kg,芬太尼(fentanyl)2 μg/kg和阿曲库铵0.08 mg/kg静脉推

注诱导插管,术中吸入最低肺泡气有效浓度(minimal alveolar concentration,MAC),即1~1.5 MAC地氟醚(desflurane)体积分数66%N₂O,维持麻醉。两组病人气管插管后控制呼吸,O₂流量2 L/min,间断静脉注射阿曲库铵维持肌肉松弛。调整呼吸参数维持呼吸末二氧化碳分压(ETCO₂)₂在35~45 mmHg。用OMEDA-DATEX监测连续监测无创动脉压(MAP)、心率(HR)、心电图(ECG)脉搏氧饱和度(SPO₂)、ETCO₂和呼气末地氟醚、N₂O的体积分数。术中均采用Aspect-1000监测脑电双频指数(bispectral index,BIS),使术中BIS维持在40~60。瑞芬太尼、丙泊酚的靶控输注采用北京思路高科技发展有限公司的TCI-1输液泵(内嵌Marsh,Minto的药代动力学参数)。术中如BIS > 60,MAP > 术前20%,HR > 90 min⁻¹,加大瑞芬太尼剂量,如BIS < 40,MAP < 术前20%,HR < 50 min⁻¹则加快输液或调整给药浓度,必要时给予血管活性药物以维持适当的麻醉深度及血液动力学的稳定。

1.3 观察指标

术毕停药后记录病人自主呼吸恢复时间,呼之睁眼时间,拔管时间,定向力恢复时间,Aldrete评分,9离开手术室时间。观察病人拔管后即刻,离开手术室,拔管后1、3、24 h的意识状态,意识状态采用OAA/S评分(The Observer's Assessment of Alertness/Sedation Scale):5分:对正常声音呼名反应迅速,完全清醒;4分:对正常声音呼名反应迟钝,语速较慢;3分:仅在大声或反复呼唤后有反应,言语模糊,目光呆滞;2分:仅对轻推或轻拍有反应,不能辨其言语;1分:对轻推或轻拍无反应,昏睡。

认知功能采用mini-mental state(MMS)测试方法^[2],通过询问病人一系列问题,包括时间定向、地点定向、记忆和计算、语言理解等11项来定量地评价其认知功能,总分为30分,23分为认知功能缺陷,下降2分以上为认知功能下降。麻醉诱导前,麻醉结束后1、3、24 h分别对病人行MMS测试。

1.4 统计学处理

采用 SPSS 11.0 软件包建立数据库,符合正态分布的计量数据用均数 \pm 标准差 ($\bar{x} \pm s$) 表示(表 1~3),非正态分布的计量数据用中位数(范围)表示(表 4)。采用 t 检验(表 1,表 3),两组方差不齐时,采用 t 检验(表 3),重复测量资料的方差分析(表 2),秩和检验进行组内和组间的比较(表 4)。等级资料采用秩和检验;计数资料采用卡方检验,取 $\alpha=0.05$ 。

2 结果

2.1 两组病人围术期 MMS 评分

TCl 组 MMS 评分术后 1 h 与术前,术后 3 h,24 h 差异有统计学意义($P < 0.05$),DF 组 MMS 评分术后 1 h 与术前,术后 3 h,24 h 比较及术后 3 h 与术前,术后 1 h,24 h 时比较差异有统计学意义($P < 0.05$),两组间比较差异无统计学意义(表 2)。术后 1 h,TCl 组有 6 例(25%),DF 组有 9 例(42.9%)病人有明显的认知功能降低,术后 3 h DF 组有 2 例(10%)病人的 MMS 值较低(< 28 分),而 TCl 组所有病人认知功能已恢复。

表 2 两组病人围术期 MMS 评分比较

Table 2 Perioperative MMS scores ($\bar{x} \pm s$)

	TCl (n=24)	DF (n=20)
Before induction	29.92 \pm 0.28	29.90 \pm 0.30
1 h after operation	28.04 \pm 1.12 ¹⁾	27.66 \pm 1.15 ¹⁾
3 h after operation	29.58 \pm 0.65	29.23 \pm 0.99 ²⁾
24 h after operation	29.92 \pm 0.28	29.90 \pm 0.30

$F_{\text{time}}=80.62, P_{\text{time}} < 0.001; F_{\text{treatment}}=2.714, P_{\text{treatment}}=0.107$ 。1)The MMS score of 1 h after operation are significantly lower than 3 h and 24 h after operation in both groups, $P < 0.05$; 2)The difference of MMS scores between 3 h after operation and before operation, 1 h, 24 h after operation has statistical significance in DF group, $P < 0.01$

2.2 术后苏醒及恢复

TCl 组呼吸恢复时间、听从指令时间及定向力恢复时间均早于 DF 组,差异有统计学意义(P 分别为 0.02,0.03 和 0.02)。拔管时间、呼之睁眼时间也早于 DF 组,但差异无统计学意义(表 3)。TCl 组在拔管即刻的 OAA/S 评分高于 DF 组,有统计学意义($P=0.007$,表 4)。

表 3 术后恢复情况

Table 3 Recovery times ($\bar{x} \pm s$)

	TCl (n=24)	DF (n=20)	t or t'	P
Spontaneous breathing (min)	2.93 \pm 1.10	5.83 \pm 3.19 ¹⁾	3.298	0.02
Eye opening (min)	7.03 \pm 2.74	7.76 \pm 3.93	0.708	0.483
Extubation (min)	7.38 \pm 3.26	8.92 \pm 4.33	1.307	0.198
Response to commands (min)	8.24 \pm 2.24	11.25 \pm 6.03 ¹⁾	2.237 ²⁾	0.033
Orientation (min)	9.91 \pm 2.23	13.37 \pm 6.45 ¹⁾	2.454 ²⁾	0.020
Time in OR after end of surgery (min)	16.65 \pm 6.21	17.76 \pm 2.93	0.782 ²⁾	0.440

1)Compared with TCl group, $P < 0.05$; 2)the value for the t' - test

表 4 围术期 OAA/S 评分

Table 4 OAA/S scale levels after operation (M (Q))

	TCl (n=24)	DF (n=20)	Z	P
Extubation	5 (5-4)	4 (4-3) ¹⁾	2.72	0.007
Transferred out OR	5 (5-4.25)	5 (5-5)	0.453	0.650
1 h after extubation	5 (5-5)	5 (5-5)	0.257	0.797
3 h after extubation	5 (5-5)	5 (5-5)	0.913	0.361

OAA/S: The Observer's Assessment of Alertness/Sedation; 1)Q= $P_{75} - P_{25}$, compared with TCl group, $P < 0.05$

3 讨论

麻醉对短时记忆和长时记忆以及顺行性和逆行性记忆认知功能等的影响,逐渐被人们所重视。国内研究观察到全身麻醉后 3 d 和 7 d 分别有 62.5%和 40%的病人发生了认知功能障碍^[1]。地氟醚麻醉后 51%病人出现短时间(持续时间 < 3 h)认知障碍^[2]。国外研究发现全麻病人在术后 24 h 比术前认知功能有显著下降^[3]。在试用多种麻醉方法,对麻醉后心理恢复的研究中发现,用丙泊酚麻醉的病人 41%有心理功能障碍^[4]。而对于全凭静脉麻醉与静吸复合麻醉两种方式对术后认知功能影响看法不一致。有文献报道认为瑞芬太尼加丙泊酚的全凭静脉麻醉在苏醒时间上比吸入地氟醚加笑气和七氟醚加笑气快,更快恢复认知功能^[5,6]。而 Biedler 等^[7]认为七氟醚复合芬太尼麻醉比瑞芬太尼复合丙泊酚更快恢复术后认知功能。本文旨在研究两种麻醉方式在术后短时间内对认知功能的影响,结果发现脑电双频指数(BIS)术中维持在 40~60,显示 TCl 组呼吸恢复时间、听从指令时间及定向力恢复时间均早于 DF 组,差异有统计学意义 TCl 组在拔管即刻的 OAA/S 评分高于 DF 组,差异有统计学意义($P=0.007$),说明 TCl 组的苏醒时间快

于 DF 组,清醒质量优于 DF 组。

Mini-Mental State(MMS)测试方法被广泛应用于术后认知功能的评估^[8,9],此方法侧重于大脑功能的认知方面,排除了情绪和神智异常等因素的影响。而且方法简单,容易操作。为了更准确和客观评价,我们研究结合监测 BIS 监控麻醉深度。本研究显示 TCI 组 MMS 评分术后 1 h 明显下降而 DF 组除术后 1 h 外,术后 3 h MMS 评分下降与其它时间相比仍有统计学意义。术后 1 h,TCI 组有 6 例(25%),DF 组有 9 例(42.9%)病人有明显的认知功能降低,术后 3 h DF 组有 2 例病人的 MMS 值较低(< 28 分),而 TCI 组所有病人认知功能已恢复。两组间比较差异无统计学意义。

综上所述,靶控输注丙泊酚加瑞芬太尼全凭静脉麻醉和地氟醚加芬太尼静吸复合麻醉对患者术后认知功能有短暂影响,可引起一过性认知功能障碍。

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参考文献:

- [1] 王春燕,吴新民.全身麻醉术后对中老年病人认知功能的影响[J].中华麻醉学杂志,2002,22(6):332-335.
- [2] 陈晓光,王俊科,王淑月.地氟醚与七氟醚麻醉对老年病人术后认知功能的影响[J].中华麻醉学杂志,2002,22(4):211-213.
- [3] MACHADO H, PEREIRA M J, ORFAO J, et al.

Changes in cognitive function performance in patients after anesthesia [J]. Acta Med Port, 2000, 13(3): 85-92.

- [4] DOWD N P, KARSKI J M, CHENG D C, et al. Fast-track cardiac anesthesia in the elderly: Effect of two different anesthetic techniques on mental recovery [J]. Br J Anaesth, 2001, 86 (1): 68-76.
- [5] SNEYD J R, ANDREWS C J, TSUBOKAWA T. Comparison of propofol/remifentanyl and sevoflurane/remifentanyl for maintenance of anaesthesia for elective intracranial surgery [J]. Br J Anaesth, 2005, 94(6): 778-783.
- [6] YAN M, WANG Y, HU X S, et al. Target-controlled infusion of remifentanyl and propofol during operation with suspension laryngoscopy [J]. Zhejiang Da Xue Xue Bao Yi Xue Ban, 2005, 34(6): 557-561.
- [7] BIEDLER A, JUCKENHOFEL S, FEISEL C, et al. Cognitive impairment in the early postoperative period after remifentanyl-propofol and sevoflurane-fentanyl anesthesia [J]. Anaesthesia, 2000, 49(4): 286-290.
- [8] BRESLIN D S, REID J E, MIRAKHUR R K, et al. Sevoflurane-nitrous oxide anaesthesia supplemented with remifentanyl: effect on recovery and cognitive function [J]. Anaesthesia, 2001, 56(2): 114-119.
- [9] O HARE R A, MIRAKHUR R K, REID J E, et al. Recovery from propofol anaesthesia supplemented with remifentanyl [J]. Br J Anaesth, 2001, 86(3): 361-365.

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- et al. Reproducibility of nerve fiber layer thickness measurements by use of optical coherence tomography [J]. Ophthalmology, 2000, 107(12):2278-2282.
- [5] LEUNG C K, YUNG W H, NG A C, et al. Evaluation of scanning resolution on retinal nerve fiber layer measurement using optical coherence tomography in normal and glaucomatous eyes [J]. J Glaucoma, 2004, 13(6):479-485.
- [6] HUANG D, SWANSON E A, LIN C P, et al. Optical coherence tomography [J]. Science, 1991, 254(5035): 1178-1181.
- [7] HEE, M R, IZATT J A, SWANSON E A, et al. Optical coherence tomography of the human retina [J]. Arch Ophthalmol, 1995, 113(3):325-332.

- [8] ZAFAR S, GURSES-OZDEN R, VESSANI R, et al. Effect of pupillary dilation on retinal nerve fiber layer thickness measurement using optical coherence tomography [J]. J Glaucoma, 2004, 13(1):34-37.
- [9] 凌运兰,刘杏,郑小萍.正常人各方位视网膜神经纤维层厚度值的测量 [J]. 中山医科大学学报, 2001, 22(3):212-214.
- [10] 肖巴伊,张振平,王铮,等.人眼高阶像差与年龄的关系及左右眼对称性研究 [J]. 中山大学学报:医学科学版, 2005, 26(1):99-103.
- [11] BUDENZ D L, MICHAEL A, CHANG R T, et al. Sensitivity and specificity of the StratusOCT for perimetric glaucoma [J]. Ophthalmology, 2005, 112(1):3-9.

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