

doi: 10.3978/j.issn.2095-6959.2022.07.020

View this article at: <https://dx.doi.org/10.3978/j.issn.2095-6959.2022.07.020>

对比不同流速丙泊酚在人工流产手术中的应用效果

王超, 肖广莉

(上海交通大学医学院附属第九人民医院麻醉科, 上海 201999)

[摘要] 目的: 对比分析不同流速丙泊酚在人工流产手术中的应用效果。方法: 选择上海交通大学医学院附属第九人民医院2019年7月至2021年7月上海交通大学医学院附属第九人民医院门诊接受人工流产手术患者114例作为研究对象。采用随机数字表法将所选患者分为A组与B组, 各57例。分别按照10 s(A组)和30 s(B组)对患者注射丙泊酚(3.0 mg/kg)实施静脉麻醉。记录并比较两组镇静成功率、麻醉起效时间、苏醒时间、离室时间、麻醉药物追加例数及次数, 此外比较两组麻醉前(T_0)、放置扩阴器时(T_1)、吸宫时(T_2)、术后10 min(T_3)的收缩压(systolic blood pressure, SBP)、舒张压(diastolic blood pressure, DBP)、心率(heart rate, HR)、脉搏血氧饱和度(pulse oxygen saturation, SpO_2)并分析术中呼吸、循环抑制情况, 记录术后不良反应情况。结果: 两组镇静成功率均为100%。与A组比较, B组患者麻醉起效时间明显延长($P<0.05$), 两组患者麻醉苏醒时间、离室时间、麻醉药物追加例数及追加次数差异均无统计学意义($P>0.05$); 与 T_0 时比较, 两组 T_1 、 T_2 、 T_3 时SBP、 SpO_2 均明显降低($P<0.05$), 且 T_3 时逐步恢复, 此外A组 T_1 时 SpO_2 明显低于B组($P<0.05$); A组诱导后呼吸抑制(术中 $SpO_2<95\%$)发生率明显高于B组($P<0.05$), 此外A组术中给予初级呼吸支持数明显高于B组($P<0.05$), 术中SBP下降超过基础值20%患者占比明显高于B组($P<0.05$); 术后不良反应有恶心、呕吐、流涎、寒战、头晕(麻醉苏醒期麻醉后遗效应)等, 但症状均较轻微, 未经处理自然缓解。两组不良反应发生率比较, 差异无统计学意义($P>0.05$)。结论: 人工流产术患者实施自主呼吸静脉麻醉时相对偏慢(建议30 s以上)的注射流速可使呼吸和循环抑制程度减轻, 血压波动减小。

[关键词] 丙泊酚; 麻醉; 人工流产; 呼吸抑制; 循环抑制; 注射速度

Comparison of application effect of propofol with different flow rates in induced abortion

WANG Chao, XIAO Guangli

(Department of Anesthesiology, Ninth People's Hospital Affiliated to Medical College of Shanghai Jiao Tong University, Shanghai 201999, China)

Abstract **Objective:** To compare and analyze the effects of propofol with different flow rates in induced abortion. **Methods:** A total of 114 outpatients of our hospital who underwent induced abortion from July 2019 to July 2021 were selected as the research subjects. They were divided into group A and group B by random number table method, with 57 cases in each group. They were injected with propofol (3.0 mg/kg) for intravenous anesthesia according to

收稿日期 (Date of reception): 2022-02-18

通信作者 (Corresponding author): 肖广莉, Email: jymz20220217@163.com

10 s (group A) and 30 s (group B) respectively. The anesthesia conditions (including the success rate of sedation, the onset time of anesthesia, the recovery time, the time of leaving the room, the number and times of additional anesthetic drugs) of the two groups were recorded and compared. In addition, the systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR) and pulse oxygen saturation (SpO_2) before anesthesia (T_0), when the vaginal dilator was placed (T_1), during uterine aspiration (T_2) and 10 min after operation (T_3) were compared between the two groups. The inhibition of respiratory and circulatory circulation during operation was analyzed, and the adverse reactions after operation were recorded. **Results:** The success rate of sedation in both groups was 100% (57/57). Compared with group A, the onset time of anesthesia in group B was significantly longer ($P<0.05$), and there was no significant difference in anesthesia recovery time, departure time, number of additional cases and times between the two groups ($P>0.05$); compared with T_0 , SBP and SpO_2 decreased significantly at T_1 , T_2 and T_3 in the two groups ($P<0.05$), and gradually recovered at T_3 . In addition, SpO_2 at T_1 in group A was significantly lower than that in group B ($P<0.05$); the incidence of respiratory depression (intraoperative $\text{SpO}_2 < 95\%$) after induction in group A was significantly higher than that in group B ($P<0.05$). In addition, the number of primary respiratory support given in group A was significantly higher than that in group B ($P<0.05$), and the proportion of patients whose SBP decreased by more than 20% during operation was significantly higher than that in group B ($P<0.05$); the postoperative adverse reactions included nausea, vomiting, salivation, chills, dizziness (aftereffect of anesthesia during anesthesia awakening), but the symptoms were mild and naturally relieved without treatment. There was no significant difference in the incidence of adverse reactions between the two groups ($P>0.05$). **Conclusion:** Patients undergoing induced abortion are relatively slow to implement spontaneous respiratory intravenous anesthesia (more than 30 s is recommended). The injection flow rate can reduce the inhibition of respiration and circulation and the fluctuation of blood pressure.

Keywords propofol; anesthesia; induced abortion; respiratory depression; circulation inhibition; injection speed

人工流产术是一种常见的门诊日间手术, 由于手术操作刺激强度较小且时间较短, 一般患者可采用保留自主呼吸静脉麻醉^[1]。丙泊酚是一种起效快、作用时间短、苏醒快的非巴比妥类的短效静脉麻醉药, 适合门诊手术患者^[2]。通常该类手术的麻醉既要保证有效性(维持麻醉深度), 又要保证安全性(维持患者呼吸和循环稳定), 因此探究给药方式意义重大。既往多探究麻醉维持阶段靶控输注丙泊酚的最佳血浆浓度^[3-4], 鲜有文献报道人工流产术静脉麻醉时丙泊酚注射流速对麻醉效果的影响。基于此, 本研究拟分析两种不同流速丙泊酚对人工流产患者麻醉起效和苏醒时间、呼吸和循环抑制程度等的影响, 旨在为门诊手术临床麻醉提供更多参考依据。

1 对象与方法

1.1 对象

选择2019年7月至2021年7月在上海交通大学医学院附属第九人民医院门诊接受人工流产手术

的患者114例作为研究对象。本研究获得上海交通大学医学院附属第九人民医院医学伦理委员会批准(审批号: SH9H-2019-T265-2), 患者知情同意并签署同意书。纳入标准: 1)初次接受人工流产手术患者, 符合早期妊娠诊断标准及人流手术指征; 2)年龄18~39岁, 体重指数(body mass index, BMI) $<30 \text{ kg/m}^2$; 3)美国麻醉医师协会(American Society of Anesthesiologist, ASA)分级I~II级。排除标准: 1)困难气道、急性呼吸道感染、严重肝肾功能损伤等相关疾病及相关药物(如异丙酚等)过敏或高敏者; 2)近2周内服用精神类药物或有酗酒史者; 3)精神异常或语言障碍者。采用随机数字表法将所选患者分为A组与B组, 各57例。

1.2 麻醉方法

术前3~7 d行常规检查并经麻醉门诊评估, 保证身体状况良好(ASA I/II)。

所有患者在手术操作前均禁食8 h、禁饮2 h以上, 入门诊手术室后开放静脉通道检查常规监测无创血压、脉搏血氧饱和度(pulse oxygen

saturation, SpO₂)和心电图, 确保辅助呼吸设备可正常工作。患者取截石位, 开放上肢静脉通路, 予鼻导管吸氧(2 L/min), 从开放的上肢静脉注射依托咪酯0.3 mg/kg, 2 min后静脉匀速注射丙泊酚(广东嘉博制药有限公司, 批准文号: 国药准字H20133248)3.0 mg/kg, A组注射时间为10 s, B组注射时间为30 s。待患者意识消失、睫毛反射消失, 刺激无体动后开始手术, 术中患者体动等影响手术操作时需追加丙泊酚0.5 mg/kg。若患者术中心动过缓[心率(heart rate, HR)<50 min⁻¹]时静注阿托品0.2 mg, 低血压[收缩压降低超过基础值30%]时静脉注射麻黄碱6 mg, 呼吸抑制(SpO₂<90%)时增加吸氧量, 仍无效后给予面罩吸氧, 呼吸囊辅助通气。

1.3 观察指标

记录并比较两组麻醉情况, 包括镇静成功率、麻醉起效时间、苏醒时间、离室时间、麻醉药物追加例数及次数, 其中以首次静脉推注药物至手术操作结束追加4次丙泊酚后患者仍存在体动等影响手术操作记为镇静失败, 以注射丙泊酚后患者睫毛反射消失时间定义为麻醉起效时间^[5]。此外比较两组麻醉前(T₀)、放置扩阴器时(T₁)、吸宫时(T₂)、术后10 min(T₃)时的收缩压(systolic blood pressure, SBP)、舒张压(diastolic blood pressure, DBP)、心率(heart rate, HR)和SpO₂并分析呼吸循环抑制情况, 此外记录两组患者在麻醉过程中发生的药物不良反应情况。

1.4 统计学处理

用SPSS 21.0软件分析数据。计数资料以率表示, 比较行 χ^2 检验; 计量资料以均数±标准差($\bar{x}\pm s$)表示, 比较行 t 检验。 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 基线资料

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(表1)。

2.2 两组麻醉情况比较

两组镇静成功率均为100%。与A组比较, B组患者麻醉起效时间明显延长($P<0.05$), 两组患者麻醉苏醒时间、离室时间、麻醉药物追加例数及追加次数差异均无统计学意义($P>0.05$, 表2)。

2.3 两组不同时间点呼吸、循环指标比较

与T₀时比较, 两组T₁、T₂、T₃时SBP、SpO₂均明显降低($P<0.05$), 且T₃时逐步恢复。此外A组T₁时SpO₂明显低于B组($P<0.05$, 表3)。

2.4 两组呼吸、循环抑制情况比较

A组诱导后呼吸抑制(术中SpO₂<95%)发生率明显高于B组($P<0.05$), 此外A组有11例患者术中给予初级呼吸支持(即轻抬下颌和经鼻导管吸氧), B组2例给予初级呼吸支持, 差异有统计学意义($P<0.05$), A组术中SBP下降超过基础值20%的患者占比明显高于B组($P<0.05$)。此外A组术中有1例注射麻黄碱纠正低血压者, 2组术中均无注射阿托品者(表4)。

2.5 安全性评价

术后不良反应有恶心、呕吐、流涎、寒战、头晕(麻醉苏醒期麻醉后遗效应)等, 但症状均较轻微, 未经处理自然缓解。两组不良反应发生率比较, 差异无统计学意义($P>0.05$, 表5)。

表1 两组一般资料比较($n=57$)

Table 1 Comparison of general data between the 2 groups ($n=57$)

组别	年龄/岁	BMI/(kg·m ⁻²)	孕周	手术时间/min	ASA分级(I/II)/例
A组	24.3 ± 3.1	21.4 ± 2.3	6.9 ± 1.1	6.8 ± 3.6	54/3
B组	23.9 ± 3.2	21.7 ± 2.2	7.0 ± 1.3	6.3 ± 3.1	52/5
χ^2/t	0.678	0.712	0.443	0.795	0.538
P	0.499	0.478	0.658	0.429	0.463

表2 两组麻醉情况比较($n=57$)Table 2 Comparison of anesthesia between the two groups ($n=57$)

组别	麻醉起效时间/s	麻醉苏醒时间/s	离室时间/min	追加麻醉药物/[例(%)]	麻醉药物追加次数
A组	40.3 ± 7.5	281.3 ± 42.7	16.7 ± 2.2	28 (49.1)	1.6 ± 0.4
B组	57.3 ± 8.3	268.3 ± 35.4	17.3 ± 2.1	23 (40.4)	1.5 ± 0.3
χ^2/t	11.473	1.770	1.489	0.887	1.510
P	<0.001	0.080	0.139	0.346	0.134

表3 两组不同时点呼吸和循环指标比较($n=57$)Table 3 Comparison of respiratory and circulatory indexes between the two groups at different time points ($n=57$)

组别	SBP/mmHg				DBP/mmHg			
	T ₀	T ₁	T ₂	T ₃	T ₀	T ₁	T ₂	T ₃
A组	119.4 ± 9.4	113.5 ± 10.4 [#]	113.4 ± 12.4 [#]	113.9 ± 11.3 [#]	71.2 ± 6.3	70.9 ± 7.9	70.6 ± 8.1	73.6 ± 7.3
B组	117.6 ± 9.2	109.9 ± 10.1 [#]	109.8 ± 11.3 [#]	114.6 ± 11.1 [#]	72.4 ± 7.1	69.7 ± 8.1	69.7 ± 7.1	74.6 ± 8.0
组别	HR/min ⁻¹				SpO ₂ /%			
	T ₀	T ₁	T ₂	T ₃	T ₀	T ₁	T ₂	T ₃
A组	82.3 ± 4.3	85.4 ± 5.3 [#]	85.5 ± 5.6 [#]	80.4 ± 4.7 [#]	99.7 ± 0.4	94.1 ± 1.2 [#]	96.6 ± 1.1 [#]	98.7 ± 1.3 [#]
B组	82.2 ± 3.6	85.2 ± 5.7 [#]	85.4 ± 5.7 [#]	79.4 ± 5.1 [#]	99.6 ± 0.5	96.2 ± 1.1 [#]	97.0 ± 1.1 [#]	98.8 ± 1.2 [#]

1 mmHg=0.133 kPa。与B组比较, * $P<0.05$; 表示与T₀比较, [#] $P<0.05$ 。

1 mmHg=0.133 kPa. Compared with group B, * $P<0.05$; Compared with T₀, [#] $P<0.05$.

表4 两组呼吸和循环抑制情况比较($n=57$)Table 4 Comparison of respiratory and circulatory inhibition between the two groups ($n=57$)

项目	A组	B组	χ^2	P
SpO ₂ /[例(%)]			13.480	<0.001
≥95%	26 (45.6)	45 (79.0)		
<95%	31 (54.4)	12 (21.0)		
呼吸支持/[例(%)]	11 (19.3)	2 (3.5)	7.033	0.008
心率/[例(%)]				
下降>20%	5 (8.8)	6 (10.5)	0.101	0.751
下降>30%	1 (1.8)	2 (3.5)	0.342	0.559
注射阿托品/[例(%)]	0 (0.0)	0 (0.0)	—	—
SBP/[例(%)]				
下降>20%	16 (28.1)	6 (10.5)	5.632	0.018
下降>30%	1 (1.8)	0 (0.0)	0.342	0.559
注射麻黄碱/[例(%)]	1 (1.8)	0 (0.0)	0.342	0.559
DBP/[例(%)]				
下降>20%	4 (7.0)	3 (5.3)	0.152	0.696
下降>30%	1 (1.8)	0 (0.0)	0.342	0.559

表5 两组不良反应发生情况比较($n=57$)Table 5 Comparison of adverse reactions between the two groups ($n=57$)

组别	恶心/[例(%)]	呕吐/[例(%)]	寒战/[例(%)]	流涎/[例(%)]	头晕/[例(%)]
A组	4 (7.0)	2 (3.5)	0 (0.0)	2 (3.5)	10 (17.5)
B组	2 (3.5)	1 (1.8)	2 (3.5)	0 (0.0)	12 (21.1)
χ^2	0.704	0.342	2.036	2.036	0.225
P	0.402	0.559	0.154	0.154	0.635

3 讨论

骶前神经丛在宫颈旁形成骨盆神经丛, 尤其以宫颈口的神经分布最为丰富^[6-7]。人工流产术中扩张宫颈及吸宫条吸附宫壁产生负压等机械刺激引起反射迷走神经功能亢进而释放乙酰胆碱, 常造成患者心律失常、血压下降、头晕等^[8-9]。因此, 手术一般需要在麻醉下完成。丙泊酚是临床广泛应用的临床麻醉药物, 属烷基酚类, 其通过激活 γ -氨基丁酸受体发挥镇静催眠作用, 广泛应用于无痛人流手术, 然而临床应用中易出现呼吸、循环抑制等, 合理的给药方式对麻醉效果可产生重要影响^[10-11]。既往研究^[12-13]多报道麻醉维持阶段丙泊酚输注的适当浓度或剂量, 如Buehrer等^[14]报道注射负荷剂量3.7 mg/kg丙泊酚可给患者提供安全而有效的麻醉, 考虑到本次研究未合并使用其他阿片类药物且选择的患者以ASA I级为主, 因此以3.0 mg/kg为丙泊酚负荷剂量并认为其符合临床实际。

目前关于麻醉诱导阶段注射丙泊酚适宜速度报道较少。本研究比较了两种速度[分别为10 s(快速)和30 s(慢速)]静脉注射丙泊酚对人工流产手术患者麻醉效果的影响, 主要分析的指标包括起效时间、苏醒时间、呼吸抑制、不良反应等, 其中注射时间及剂量参考了Sepulveda等^[15]、Mu等^[16]的研究, 前者认为注射负荷剂量丙泊酚的时间为(36±9) s, 后者认为应在10 s内注射负荷剂量2.5 mg/kg丙泊酚。研究结果显示: 行人工流产手术给予患者保留自主呼吸的静脉麻醉时, 以相对偏慢的速度注射丙泊酚更有利于维持患者呼吸及循环稳定, 慢速注射丙泊酚的患者呼吸抑制较轻, $SpO_2 < 95\%$ 占比较低, 需要呼吸支持比例较低, 同时慢速注射丙泊酚患者SBP下降超过基础值20%比例较低, 不过慢速注射丙泊酚患者达到麻醉状态时间有所延长。Sepulveda等^[15]在研究丙泊酚注射速度对患者意识消失潜在机制的影响时发现较快注射丙泊酚可使患者意识消失时脑干反射减弱, 而慢速注射可保留脑干反射, 同时指出意识

消失后 SpO_2 和SBP下降显著, 在这一过程中慢速注射丙泊酚对患者 SpO_2 和SBP下降程度的影响较轻, 提示丙泊酚可自上而下地抑制中枢神经系统, 事实上丙泊酚可减少脑血流量和脑灌注, 相对较慢的注射速度对维持患者呼吸及循环稳定更佳, 临床中不必过分苛求麻醉起效速度, 否则适得其反。丙泊酚引起的呼吸和循环抑制效应呈剂量依赖性和浓度依赖性, 因此术前需充分准备呼吸支持方案, 本次研究术前提提供了初级、二级(面罩吸氧+简易呼吸球囊通气)、三级(气管插管+床旁呼吸机通气)这3个级别的呼吸支持, 但是由于受试者群体多为ASA I级健康人群, 最终出现呼吸和循环抑制时均采用了初级呼吸支持, 使得患者 SpO_2 很快就升至95%以上。

此外, 值得说明的是采用丙泊酚麻醉安全性高, 术后发生的不良反应主要是呼吸抑制和血压下降, 患者不良反应症状均较轻微。实施丙泊酚麻醉可降低麻醉过程中患者恶心、呕吐的发生率, 提示丙泊酚可以拮抗多巴胺受体, 具有止吐作用, 有研究^[17-18]发现丙泊酚术后止吐作用可延续超10 h。此外丙泊酚可抑制迷走神经背核, 抑制手术对体内器官的牵拉反应^[19-20]。

综上所述, 人工流产术患者实施自主呼吸静脉麻醉时相对偏慢(建议30 s以上)的注射流速可使呼吸和循环抑制程度减轻, 血压波动减小, 有助于保留患者自主呼吸和稳定血流动力学。但本研究不足之处在于所选样本量较小, 今后应开展合理的大样本作进一步研究。

参考文献

1. 陈曦希, 陈贵海, 汪欢, 等. 不同镇静方案在无痛人流术中的应用及对认知的影响[J]. 中华全科医学, 2021, 19(4): 538-541.
CHEN Xixi, CHEN Guihai, WANG Huan, et al. Application of different types of sedation methods in painless induced abortion and their influence on cognition of puerpera[J]. Chinese Journal of General

- Practice, 2021, 19(4): 538-541.
2. 刘香玉, 夏瑞, 赵晓咏, 等. 甲苯磺酸瑞马唑仑与丙泊酚应用于无痛人流人工流产术的临床对照研究[J]. 北京医学, 2021, 43(12): 1229-1231.
LIU Xiangyu, XIA Rui, ZHAO Xiaoyong, et al. A comparative study on the clinical application of cresol sulfonic acid and propofol sulfonic acid in induced abortion[J]. Beijing Medical Journal, 2021, 43(12): 1229-1231.
 3. 肖成娇, 顾夏芳, 杨芳, 等. 静脉注射丙泊酚速度对人工流产手术患者麻醉效果的影响[J]. 医学研究生学报, 2021, 34(7): 745-749.
XIAO Chengjiao, GU Xiafang, YANG Fang, et al. Anesthetic efficacy of propofol at two injection rates on the patients undergoing artificial abortion[J]. Journal of Medical Postgraduates, 2021, 34(7): 745-749.
 4. 夏凡, 沈晓凤, 张瑶, 等. 地佐辛复合丙泊酚用于人工流产手术的效果[J]. 临床麻醉学杂志, 2016, 32(5): 500-501.
XIA Fan, SHEN Xiaofeng, ZHANG Yao, et al. Effect of dizocine combined with propofol on induced abortion[J]. Journal of Clinical Anesthesiology, 2016, 32(5): 500-501.
 5. 凌学民, 刘继群, 骆慧芳. 两种镇痛方法在人工流产手术中的临床比较[J]. 重庆医学, 2015, 44(12): 1648-1649.
LING Xuejun, LIU Jiqun, LUO Huifang. Clinical comparison of two kinds of analgesic methods used in artificial abortion[J]. Chongqing Medicine, 2015, 44(12): 1648-1649.
 6. Kang R, Shin BS, Shin YH, et al. Incidence of tolerance in children undergoing repeated administration of propofol for proton radiation therapy: a retrospective study[J]. BMC Anesthesiol, 2018, 18(1): 125.
 7. Pertzoy B, Krasulya B, Azem K, et al. Dexmedetomidine versus propofol sedation in flexible bronchoscopy: a randomized controlled trial[J]. BMC Pulm Med, 2022, 22(1): 87.
 8. 叶君, 范东毅, 张茹, 等. 利多卡因宫颈旁阻滞联合丙泊酚静脉全麻在人工流产术中的应用[J]. 中国新药与临床杂志, 2020, 39(7): 414-417.
YE Jun, FAN Dongyi, ZHANG Ru, et al. Application of paracervical block with lidocaine combined with intravenous propofol anesthesia in induced abortion[J]. Chinese Journal of New Drugs and Clinical Remedies, 2020, 39(7): 414-417.
 9. 葛军甫, 韩学昌. 舒芬太尼和瑞芬太尼分别复合异丙酚用于无痛人流人工流产术效果[J]. 中国计划生育学杂志, 2021, 29(12): 2668-2670.
GE Junfu, HAN Xuechang. Effect of sufentanil or remifentanil combined with propofol during painless induced abortion[J]. Chinese Journal of Family Planning, 2021, 29(12): 2668-2670.
 10. 高伟峰. 无痛人流人工流产手术患者应用丙泊酚复合酮咯酸氨丁三醇麻醉的临床效果[J]. 中国药物与临床, 2021, 21(7): 1110-1112.
GAO Weifeng. Clinical effect of propofol combined with ketorolac tromethamine anesthesia in patients with painless induced abortion[J]. Chinese Remedies and Clinics, 2021, 21(7): 1110-1112.
 11. 芮鹏飞, 王俊华, 朱国栋, 等. 丙泊酚复合芬太尼麻醉在人工流产术中的应用及对患者Th1/Th2细胞因子平衡的影响[J]. 临床与病理杂志, 2020, 40(8): 2113-2118.
RUI Pengfei, WANG Junhua, ZHU Guodong, et al. Propofol combined with fentanyl anesthesia in induced abortion intraoperative application and its effect on patients' Th1/Th2 cytokine balance[J]. Journal of Clinical and Pathological Research, 2020, 40(8): 2113-2118.
 12. Oh TK, Lee SJ, Kim JH, et al. The administration of high-dose propofol sedation with manual and target-controlled infusion in children undergoing radiation therapy: a 7-year clinical investigation[J]. Springerplus, 2016, 5: 376.
 13. 李玲, 顾士敏, 刘琼丽, 等. 地佐辛联合丙泊酚对人工流产者生命体征、应激水平及唤醒时间的影响[J]. 中国计划生育学杂志, 2021, 29(7): 1360-1363.
LI Ling, GU Shimin, LIU Qiongli, et al. The effect of dezocine combined with propofol for anesthesia of the women with induced abortion on their vital signs, stress level, and wake-up time[J]. Chinese Journal of Family Planning, 2021, 29(7): 1360-1363.
 14. Buehrer S, Immoos S, Frei M, et al. Evaluation of propofol for repeated prolonged deep sedation in children undergoing proton radiation therapy[J]. Br J Anaesth, 2007, 99(4): 556-560.
 15. Sepulveda P, Cortinez LI, Irani M, et al. Differential frontal alpha oscillations and mechanisms underlying loss of consciousness: a comparison between slow and fast propofol infusion rates[J]. Anaesthesia, 2020, 75(2): 196-201.
 16. Mu J, Jiang T, Xu XB, et al. Comparison of target-controlled infusion and manual infusion for propofol anaesthesia in children[J]. Br J Anaesth, 2018, 120(5): 1049-1055.
 17. Biau DJ, Porcher R, Roren A, et al. Neither pre-operative education or a minimally invasive procedure have any influence on the recovery time after total hip replacement[J]. Int Orthop. 2015, 39(8): 1475-1481.
 18. Anderson BJ, Bagshaw O. Practicalities of total intravenous anesthesia and target-controlled infusion in children[J]. Anesthesiology, 2019, 131(1): 164-185.
 19. 尚枝连, 郭伟, 陈传员. 无痛人流人工流产术应用丙泊酚联合纳布啡静脉麻醉的疗效观察[J]. 中国药物与临床, 2021, 21(10): 1695-1697.
SHANG Zhilian, GUO Wei, CHEN Chuanbing. Effect of propofol combined with naborphine intravenous anesthesia on painless induced abortion[J]. Chinese Remedies & Clinics, 2021, 21(10): 1695-1697.
 20. Lu Y, Xiao Y, Tu Y, et al. Propofol-induced sleep ameliorates cognition impairment in sleep-deprived rats[J]. Sleep Breath, 2022, Epub ahead of print.

本文引用: 王超, 肖广莉. 对比不同流速丙泊酚在人工流产手术中的应用效果[J]. 临床与病理杂志, 2022, 42(7): 1651-1656. doi: 10.3978/j.issn.2095-6959.2022.07.020

Cite this article as: WANG Chao, XIAO Guangli. Comparison of application effect of propofol with different flow rates in induced abortion[J]. Journal of Clinical and Pathological Research, 2022, 42(7): 1651-1656. doi: 10.3978/j.issn.2095-6959.2022.07.020