

doi: 10.13241/j.cnki.pmb.2018.03.029

盐酸右美托咪定联合瑞芬太尼在骨科手术中的镇静效果及对患者血流动力学和呼吸功能的影响

李海燕¹ 郑智文¹ 杨兴² 孙鹏³ 黄俊生⁴

(1 唐山市人民医院麻醉科 河北 唐山 063017; 2 唐山市协和医院麻醉科 河北 唐山 063000;

3 唐山市工人医院麻醉科 河北 唐山 063007; 4 唐山市海港开发区医院麻醉科 河北 唐山 063611)

摘要 目的: 探讨盐酸右美托咪定联合瑞芬太尼在骨科手术中的镇静效果及对患者血流动力学和呼吸功能的影响。**方法:** 选择2016年3月至2017年5月在我院186例行骨科手术的患者,根据数表法随机分为对照组(93例)和观察组(93例),对照组采用丙泊酚联合瑞芬太尼进行麻醉,观察组采用盐酸右美托咪定联合瑞芬太尼进行麻醉,比较两组用药前(T_1)、联合用药后10 min(T_2)、联合用药后20 min(T_3)、联合用药后30 min(T_4)和患者清醒后(T_5)等时间点的镇静效果以及血流动力学和呼吸功能指标变化,并比较两组不良反应发生率。**结果:** T_3 、 T_4 时间点两组警觉/镇静(OAA/S)评分低于组内其他时间点,且观察组OAA/S评分低于对照组($P<0.05$)。两组 T_1 、 T_5 时间点呼吸频率(RR)、血氧饱和度(SpO_2)比较差异无统计学意义($P>0.05$);在 T_2 、 T_3 、 T_4 时间点观察组RR、 SpO_2 高于对照组($P<0.05$); T_3 、 T_4 时间点两组的RR水平均低于组内其他时间点($P<0.05$)。两组各时间点平均动脉压(MAP)、心率(HR)水平比较差异均无统计学意义($P>0.05$)。观察组呼吸抑制、呼吸道阻塞和恶心呕吐的发生率低于对照组($P<0.05$)。**结论:** 盐酸右美托咪定联合瑞芬太尼在骨科手术中镇静效果良好,对患者血流动力学的影响较小,呼吸抑制程度轻,安全性好。

关键词: 骨科手术; 盐酸右美托咪定; 瑞芬太尼; 镇静效果; 血流动力学; 呼吸功能

中图分类号: R687; R614 **文献标识码:** A **文章编号:** 1673-6273(2018)03-532-05

Sedative Effect of Hydrochloride Dexmedetomidine Combine with Remifentanil in Orthopedics Surgery and Its Influence on Hemodynamics and Respiratory Function

LI Hai-yan¹, ZHENG Zhi-wen¹, YANG Xing², SUN Peng³, HUANG Jun-sheng⁴

(1 Department of Anesthesiology, Tangshan People's Hospital, Tangshan, Hebei, 063017, China;

2 Department of Anesthesiology, Tangshan Union Hospital, Tangshan, Hebei, 063000, China;

3 Department of Anesthesiology, Tangshan Worker's Hospital, Tangshan, Hebei, 063007, China;

4 Department of Anesthesiology, Haigang Development Zone Hospital of Tangshan, Tangshan, Hebei, 063611, China)

ABSTRACT Objective: To explore the sedative effect of hydrochloride dexmedetomidine combine with remifentanil in the orthopedics surgery and its influence on hemodynamics and respiratory function. **Methods:** A total of 186 patients, who underwent orthopedics surgery in Tangshan People's Hospital from March 2016 to May 2017, were selected and randomly divided into observation group (93 cases) and control group (93 cases). The control group received propofol combined with remifentanil for anesthesia; the observation group received hydrochloride dexmedetomidine combined with remifentanil for anesthesia. The sedative effect between the two groups before treatment (T_1), 10 min after combined use of drugs (T_2), 20min after combined use of drugs (T_3), 30 min after combined use of drugs (T_4) and after the patients were conscious(T_5) and hemodynamics and respiratory function were compared, and the incidence of adverse reactions was compared between the two groups. **Results:** The Alertness / sedation (OAA/S) scores of the two groups at T_3 and T_4 time points were lower than those at other time points in the two group, and the OAA/S score of the observation group was lower than that of the control group ($P<0.05$). There were no significant differences in respiratory rate (RR) and oxygen saturation (SpO_2) between the two groups at T_1 and T_5 time points ($P>0.05$). At the time of T_2 , T_3 and T_4 , the RR and SpO_2 of the observation group were higher than those of the control group ($P<0.05$). The RR levels of the two groups at T_3 and T_4 time points were lower than those of the other time points ($P<0.05$). There were no significant differences in mean arterial pressure (MAP) and heart rate (HR) between the two groups at each time point ($P>0.05$). The incidence of respiratory depression, respiratory tract infarction and nausea and vomiting in the observation group was lower than that in the control group ($P<0.05$). **Conclusion:** Hydrochloride dexmedetomidine combined with remifentanil has a good sedative effect in the orthopedics surgery, with less influence on hemodynamics, mild respiratory depression and good safety.

作者简介:李海燕(1980-),女,本科,主治医师,主要从事麻醉学的研究,E-mail: 1098277941@qq.com

(收稿日期:2017-09-08 接受日期:2017-09-27)

Key words: Operation of orthopedics surgery; Hydrochloride dexmedetomidine; Remifentanyl; Sedative effect; Hemodynamics; Respiratory function

Chinese Library Classification(CLC): R687; R614 **Document code:** A

Article ID: 1673-6273(2018)03-532-05

前言

随着现代麻醉技术的发展,区域阻滞麻醉技术已趋向成熟,并被广泛应用于骨科手术中^[1]。在区域阻滞下行骨科手术的患者,手术过程中其意识处于清醒的状态,这可能使患者产生焦虑、恐惧、紧张等负向心理应激反应,因而必须给予一定的镇静、镇痛药物治疗,以提高患者的舒适度,增强麻醉效果^[2,3]。盐酸右美托咪定是一种 α_2 -肾上腺素受体激动剂,具有较强的镇静效果,同时具备稳定患者血流动力学的作用^[4,5]。瑞芬太尼是芬太尼类 μ 型阿片受体激动剂,镇痛作用较好,且起效快,维持时间短,但单独用药效果不佳^[6-8]。近年来已有研究表明^[9-11],盐酸右美托咪定联合瑞芬太尼的镇痛镇静效果优于单独用药,但二药联合应用的系统研究报告较少,本文特采用随机试验进行研究,试图从镇静效果、患者血流动力学和呼吸功能三个方面探讨二药联合应用的优势,以期为临床提供参考经验。

1 资料和方法

1.1 一般资料

选择 2016 年 3 月至 2017 年 5 月在我院进行骨科手术的患者 186 例为研究对象。纳入标准:(1)符合骨科手术的条件,均为四肢骨折手术,患者及其家属均签署知情同意书;(2)根据美国麻醉医师协会(American society of anesthesiologists, ASA)的分级标准^[12],所有患者均为 I 级或 II 级;(3)拟采用区域阻滞麻醉方式进行手术,完成本研究的所有调查项目者;(4)无相关药物过敏史者。排除标准:(1)伴心脑血管疾病者;(2)伴震颤麻痹、癫痫、认知功能障碍等精神科疾病者;(3)伴肝功能障碍及慢性心率者;(4)长期服用催眠药物者。采用随机数字表法分为观察组(93 例)和对照组(93 例)。观察组男 56 例,女 37 例;年龄 20~73 岁,平均(37.18 $\pm$ 6.84)岁;ASA 分级:I 级 41 例,II 级 52 例;体重 44~72 kg,平均(59.76 $\pm$ 9.62)kg。对照组男 54 例,女 39 例;年龄 21~72 岁,平均(36.73 $\pm$ 7.22)岁;ASA 分级:I 级 40 例,II 级 53 例;体重 45~74 kg,平均(60.13 $\pm$ 10.26)kg。两组患者一般资料比较无差异($P>0.05$)。本研究经医院伦理委员会审核批准。

1.2 麻醉方法

两组患者入室后均常规准备,于下颌后静脉开放上肢静脉通路,均行区域阻滞麻醉,由专业人员测量麻醉平面达到的预

期范围后进一步用药。观察组:在开始手术前 10 min 静脉注射盐酸右美托咪定和瑞芬太尼,盐酸右美托咪定注射液(江苏恩华药业股份有限公司,国药准字 H20110085,规格 2 mL: 0.2 mg 以右美托咪定计)1 μ g/kg,注射用盐酸瑞芬太尼(江苏恩华药业股份有限公司,国药准字 H20143315,规格 2mg 以瑞芬太尼计)0.8 μ g/kg,术中以盐酸右美托咪定 0.3 μ g/kg $\cdot$ h 和瑞芬太尼 0.1 μ g/kg $\cdot$ min 维持。对照组:在手术开始前 5 min 静脉注射丙泊酚乳状注射液(西安力邦制药有限公司,国药准字 H20010368,规格 10 mL: 100 mg)2 mg/kg,瑞芬太尼用法用量同观察组,术中以丙泊酚 4 μ g/kg $\cdot$ h 和瑞芬太尼 0.1 μ g/kg $\cdot$ min 维持。

1.3 观察指标

于用药前(T_1)、联合用药后 10 min(T_2)、联合用药后 20 min(T_3)、联合用药后 30 min(T_4)和患者清醒后(T_5)比较两组患者的镇静效果、血流动力学和呼吸功能指标变化。镇静效果:根据警觉/镇静(The observer's assessment of alertness/sedation, OAA/S)评分标准进行评分^[13],5 分:患者对正常语调呼唤迅速反应;4 分:对正常语调呼唤反应冷淡;3 分:仅对大声呼唤或反复呼唤有反应;2 分:仅对轻度摇推肩膀或头部有反应;1 分:对轻度推摇无反应;0 分:对挤捏斜方肌无反应。采用 MHM6000A 型多功能心电监护仪(购于广州康迈医疗器械有限公司)动态监测两组呼吸频率(Respiratory rate, RR)、平均动脉压(Mean arterial pressure, MAP)、心率(Heart Rate, HR)、血氧饱和度(Oxygen saturation, SpO₂)。记录两组药物相关不良反应发生情况。

1.4 统计学方法

研究数据均采用 SPSS21.0 统计学软件进行统计分析, OAA/S 评分、RR、MAP、HR、SpO₂ 等计量资料经正态性检验均符合正态分布,采用均数 $\pm$ 标准差($\bar{x} \pm s$)描述,实施 t 检验,计数资料用率(%)描述,实施 χ^2 检验;以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组各时间点 OAA/S 评分比较

T_1 、 T_2 、 T_5 时间点两组 OAA/S 评分比较无差异($P>0.05$); T_3 、 T_4 时间点观察组 OAA/S 评分低于对照组($P<0.05$); T_3 、 T_4 时间点两组 OAA/S 评分低于组内其他时间点,差异有统计学意义($P<0.05$)。详见表 1。

表 1 两组 OAA/S 评分比较($\bar{x} \pm s$)

Table 1 Comparison of OAA/S scores between the two groups($\bar{x} \pm s$)

Groups	n	T_1	T_2	T_3	T_4	T_5
Observation group	93	5.00 $\pm$ 0.00	4.12 $\pm$ 0.13	3.07 $\pm$ 0.21*	2.56 $\pm$ 0.11*	4.92 $\pm$ 0.21
Control group	93	5.00 $\pm$ 0.00	4.23 $\pm$ 0.14	3.67 $\pm$ 0.18*	3.02 $\pm$ 0.08*	4.89 $\pm$ 0.16
t	-	0.000	0.165	2.743	2.663	0.083
P	-	1.000	0.903	0.027	0.028	0.962

Note: compared with other time points in the group, * $P<0.05$.

2.2 两组各时间点 RR 比较

T₁、T₅ 时间点两组 RR 水平比较差异无统计学意义 (P>0.05); 观察组 T₂、T₃、T₄ 时间点 RR 水平高于对照组 (P<0.05);

两组 T₃ 及 T₄ 时间点 RR 水平低于组内与其他时间点, 差异有统计学意义 (P<0.05)。详见表 2。

表 2 两组各时间点 RR 水平比较($\bar{x} \pm s$, 次/min)

Table 2 Comparison of RR levels between two groups ($\bar{x} \pm s$, number of times/min)

Groups	n	T ₁	T ₂	T ₃	T ₄	T ₅
Observation group	93	17.63± 2.78	16.57± 2.34	15.17± 1.79*	15.28± 2.03*	16.57± 1.43
Control group	93	17.45± 2.26	14.18± 2.26	11.52± 2.05*	12.62± 2.36*	15.92± 1.64
t	-	0.114	4.682	5.428	4.973	1.034
P	-	0.785	0.000	0.000	0.000	0.097

Note: compared with other time points in the group, *P<0.05.

2.3 两组各时间点血流动力学指标比较

T₁、T₂、T₃、T₄、T₅ 等时间点两组 MAP、HR 水平比较差异均无统计学意义 (P>0.05); T₁、T₅ 时间点两组 SpO₂ 水平比较差异无统计学意义 (P>0.05); 观察组 T₂、T₃、T₄ 时间点 SpO₂ 水平

高于对照组, 差异有统计学意义 (P<0.05); 对照组 T₂、T₃、T₄ 时间点 SpO₂ 水平与组内其他时间点比较差异有统计学意义 (P<0.05)。详见表 3。

表 3 两组各时间点 MAP、HR、SpO₂ 水平比较($\bar{x} \pm s$)

Table 3 Comparison of MAP, HR, SpO₂ levels at different time points between two groups ($\bar{x} \pm s$)

Indexs	Groups	n	T ₁	T ₂	T ₃	T ₄	T ₅
MAP(mmHg)	Observation group	93	81.57± 9.64	80.26± 9.18	81.13± 9.94	82.08± 9.35	82.01± 9.62
	Control group	93	82.23± 9.78	81.72± 9.61	81.09± 9.67	80.79± 9.07	28.12± 9.47
HR(次/min)	Observation group	93	76.08± 7.52	76.13± 7.61	75.62± 7.31	75.01± 7.08	75.80± 7.05
	Control group	93	75.82± 7.36	75.57± 7.80	74.98± 7.16	75.70± 7.44	76.17± 6.92
SpO ₂ (%)	Observation group	93	99.41± 9.83	98.72± 9.44 [#]	97.86± 9.03 [#]	98.09± 9.17 [#]	99.08± 9.64
	Control group	93	99.64± 9.48	95.73± 8.05*	92.15± 7.63*	94.07± 7.98*	98.25± 9.56

Note: compared with other time points in the group, *P<0.05; compared with control group, [#]P<0.05.

2.4 两组药物相关不良反应发生率比较

观察组呼吸抑制、呼吸道梗塞和恶心呕吐的发生率低于对照组, 差异有统计学意义 (P<0.05); 两组低血压、躁动、肌紧张

等不良反应发生率比较差异无统计学意义 (P>0.05)。详见表 4。所有发生不良反应的患者经对症处理或未处理好转, 均不影响手术的开展。

表 4 两组药物相关不良反应发生率比较[n(%)]

Table 4 Comparison of incidence of drug-related adverse reactions between two groups[n(%)]

Groups	n	Respiratory depression	Hypotension	Dysphoria	Respiratory tract infarction	Muscle tension	Nausea and vomiting
Observation group	93	5(5.38)	2(2.15)	3(3.23)	4(4.30)	1(1.08)	6(6.45)
Control group	93	13(13.98)	3(3.23)	5(5.38)	14(15.05)	2(2.15)	17(18.28)
t	-	4.136	0.206	0.576	4.872	0.339	5.126
P	-	0.041	0.836	0.712	0.035	0.801	0.028

3 讨论

与其他麻醉方式相比, 区域阻滞麻醉费用较低, 加上其技术的成熟, 目前在骨科手术中的应用已较为普遍^[14]。区域阻滞麻醉最大的特点就是不能完全阻断内脏神经传导, 患者在处于意识清醒的状态下进行手术, 以致患者难免会产生害怕等各种负向心理应激, 影响手术的正常进行^[15,16]。因而在区域阻滞麻醉下进行手术的患者, 有效缓解患者的心理应激成为手术成功的关键环节之一, 同时也是国内外学者共同关注的热点问题。既

往研究发现^[17,18], 在区域阻滞下进行骨科手术的患者, 为了达到镇静催眠的效果, 往往给予镇静催眠药物干预, 如丙泊酚、氟哌利等, 但以上两种药物由于镇静作用时间较长, 术后可能导致患者清醒不完善, 进而诱发多种不良反应, 且对患者血流动力学的稳定影响较大, 呼吸抑制作用强, 间接影响了手术效果。瑞芬太尼是一种新型的阿片类受体激动剂, 由于其血脑平衡时间较短、分布容积较小、清除率快, 起效快, 是临床上常用的麻醉药物, 但其单药效果欠佳^[19,21]。盐酸右美托咪定是分子量为 236.7 的 α₂-肾上腺素受体激动剂, 是一种新型的辅助麻醉药

物,其可通过刺激脑中蓝斑 $\alpha 2$ -肾上腺素受体起催眠、镇静的作用,且对患者中枢神经系统的影响较小,另外具有较好的稳定血流动力学的作用,能有效保护患者的心肌^[22,23]。

本研究显示,两组 OAA/S 评分 T_1 、 T_2 、 T_5 时间点比较差异不明显,观察组 T_3 、 T_4 时间点 OAA/S 评分低于对照组,两组 T_3 、 T_4 时间点 OAA/S 评分低于组内其他时间点,说明盐酸右美托咪定联合瑞芬太尼在骨科手术中的镇静效果优于丙泊酚联合瑞芬太尼。两组 T_1 、 T_5 时间点的 RR 比较差异不明显,对照组在 T_2 、 T_3 、 T_4 时间点 RR 水平低于观察组,两组 T_3 、 T_4 时间点 RR 水平明显低于组内其他时间点,说明在区域阻滞麻醉下进行骨科手术的患者,相比丙泊酚联合瑞芬太尼而言,盐酸右美托咪定联合瑞芬太尼对患者呼吸抑制作用更轻。两组 T_1 、 T_2 、 T_3 、 T_4 、 T_5 等时间点 MAP、HR 水平比较及组内不同时间点比较差异均不明显,两组 T_1 、 T_5 时间点 SpO_2 水平比较差异不明显, T_2 、 T_3 、 T_4 时间点观察组 SpO_2 水平高于对照组,说明在区域阻滞麻醉下进行骨科手术的患者,采用盐酸右美托咪定联合瑞芬太尼对患者血流动力学稳定性的影响更小。观察组呼吸抑制、呼吸道梗塞和恶心呕吐的发生率低于对照组,但两组患者低血压、躁动、肌紧张等不良反应发生率比较差异不明显,这说明区域阻滞麻醉下进行手术的骨科患者,相比丙泊酚联合瑞芬太尼而言,盐酸右美托咪定联合瑞芬太尼的安全性更好。以上结果表明,盐酸右美托咪定联合瑞芬太尼具有良好的辅助镇静效果,安全性好,与相关研究^[24,25]基本吻合。盐酸右美托咪定联合瑞芬太尼的镇静效果佳、对呼吸抑制作用轻、对血流动力学稳定性影响小,其原因可能是:第一,盐酸右美托咪定通过刺激突触前膜 $\alpha 2$ 受体,可抑制去甲肾上腺素的释放和降低神经元兴奋,终止了疼痛信号的传递^[26,27]。第二,盐酸右美托咪定与髓内 $\alpha 2$ 受体结合后产生镇静效果,缓解患者产生的焦虑、恐惧等负向应激反应,且对呼吸抑制的程度轻^[28]。第三,已有研究表明^[29,30],盐酸右美托咪定联合瑞芬太尼可使患者达到近事遗忘的效果,近事遗忘可有效抵制患者术中出现的心理恐惧和应激反应。

综上所述,区域阻滞麻醉下进行骨科手术的患者给予盐酸右美托咪定联合瑞芬太尼的辅助镇静效果理想,对患者血流动力学的影响小,呼吸抑制作用轻,且呼吸抑制、呼吸道梗塞及恶心呕吐等相关不良反应发生率低,值得临床应用。

参考文献(References)

- [1] Mukherjee B, Venkatakrishnan JV, George B, et al. Evaluation of an Ophthalmic Anesthesia Simulation System for Regional Block Training[J]. *Ophthalmology*, 2015, 122(12): 2578-2580
- [2] Bojaxhi E, Salek DR, Sherman CE, et al. Regional anesthesia for a total knee arthroplasty on an adult patient with spastic diplegia and an intrathecal baclofen pump[J]. *Rom J Anaesth Intensive Care*, 2017, 24(1): 69-72
- [3] Vlassakov KV, Kissin I. Assessing advances in regional anesthesia by their portrayals in meta-analyses: an alternative view on recent progress[J]. *BMC Anesthesiol*, 2017, 17(1): 112
- [4] Seddighi R, Odoi A, Doherty TJ. Effect of dexmedetomidine hydrochloride on tiletamine hydrochloride-zolazepam hydrochloride anesthesia in alpacas[J]. *Am J Vet Res*, 2016, 77(10): 1057-1063
- [5] Willey JL, Julius TM, Claypool SP, et al. Evaluation and comparison of xylazine hydrochloride and dexmedetomidine hydrochloride for the induction of emesis in cats: 47 cases (2007-2013)[J]. *J Am Vet Med Assoc*, 2016, 248(8): 923-928
- [6] Hwang W, Lee J, Park J, et al. Dexmedetomidine versus remifentanyl in postoperative pain control after spinal surgery: a randomized controlled study[J]. *BMC Anesthesiol*, 2015, 24(15): 21
- [7] Pikwer A, Castegren M, Namdar S, et al. Effects of surgery and propofol-remifentanyl total intravenous anesthesia on cerebrospinal fluid biomarkers of inflammation, Alzheimer's disease, and neuronal injury in humans: a cohort study[J]. *J Neuroinflammation*, 2017, 14(1): 193
- [8] Motamed C, Audibert J, Albi-Feldzer A, et al. Postoperative pain scores and opioid consumption in opioid-dependent patients with cancer after intraoperative remifentanyl analgesia: A prospective case-controlled study[J]. *J Opioid Manag*, 2017, 13(4): 221-228
- [9] Cho JS, Soh S, Kim EJ, et al. Comparison of three sedation regimens for drug-induced sleep endoscopy [J]. *Sleep Breath*, 2015, 19(2): 711-717
- [10] Choi EK, Seo Y, Lim DG, et al. Postoperative nausea and vomiting after thyroidectomy: a comparison between dexmedetomidine and remifentanyl as part of balanced anesthesia [J]. *Korean J Anesthesiol*, 2017, 70(3): 299-304
- [11] Li X, Wang X, Jin S, et al. The safety and efficacy of dexmedetomidine-remifentanyl in children undergoing flexible bronchoscopy: A retrospective dose-finding trial [J]. *Medicine (Baltimore)*, 2017, 96(11): e6383
- [12] Koo CY, Hyder JA, Wanderer JP, et al. A meta-analysis of the predictive accuracy of postoperative mortality using the American Society of Anesthesiologists' physical status classification system [J]. *World J Surg*, 2015, 39(1): 88-103
- [13] Kim J, Kim WO, Kim HB, et al. Adequate sedation with single-dose dexmedetomidine in patients undergoing transurethral resection of the prostate with spinal anaesthesia: a dose-response study by age group [J]. *BMC Anesthesiol*, 2015, 27(15): 17
- [14] 马宇, 苏佳灿, 陈建芳, 等. 区域神经阻滞技术在创伤胫腓骨折患者麻醉中的应用[J]. *第二军医大学学报*, 2016, 37(11): 1406-1409
Ma Yu, Su Jia-can, Chen Jian-fang, et al. Application of peripheral nerve block in anesthesia management of patients with trauma of the tibia and fibula [J]. *Academic Journal of Second Military Medical University*, 2016, 37(11): 1406-1409
- [15] Ilfeld BM, Liguori GA. Regional Anesthesia "Block Rooms": Should They Be Universal Look to Goldilocks (and Her 3 Bears) for the Answer[J]. *Reg Anesth Pain Med*, 2017, 42(5): 551-553
- [16] Lönqvist PA, Ecoffey C, Bosenberg A, et al. The European society of regional anesthesia and pain therapy and the American society of regional anesthesia and pain medicine joint committee practice advisory on controversial topics in pediatric regional anesthesia I and II: what do they tell us?[J]. *Curr Opin Anaesthesiol*, 2017, 30(5): 613-620
- [17] 薛卫东, 曹建设, 郭安梅, 等. 神经刺激仪经肌间沟定位臂丛神经分支行臂丛麻醉效果分析 [J]. *现代生物医学进展*, 2014, 14(2): 272-274, 308
Xue Wei-dong, Cao Jian-she, Guo An-mei, et al. A Comparative Study of Interscalene Brachial Plexus Block by Nerve Stimulator Locating Different Brachial Plexus Branches [J]. *Progress in Modern*

- Biomedicine, 2014, 14(2): 272-274, 308
- [18] Veljkovic A, Dwyer T, Lau JT, et al. Neurological Complications Related to Elective Orthopedic Surgery: Part 3: Common Foot and Ankle Procedures[J]. Reg Anesth Pain Med, 2015, 40(5): 455-466
- [19] Freeman LM, Bloemenkamp KW, Franssen MT, et al. Patient controlled analgesia with remifentanyl versus epidural analgesia in labour: randomised multicentre equivalence trial [J]. BMJ, 2015, 23 (350): h846
- [20] Shin S, Kim S. Dental treatment in patients with severe gag reflex using propofol-remifentanyl intravenous sedation[J]. J Dent Anesth Pain Med, 2017, 17(1): 65-69
- [21] Sbaraglia F, De Riso M, Riccioni ME, et al. Does caffeine improve respiratory rate during remifentanyl target controlled infusion sedation? A case report in endoscopic sedation[J]. J Opioid Manag, 2017, 13(2): 125-127
- [22] Nonaka T, Inamori M, Miyashita T, et al. Feasibility of deep sedation with a combination of propofol and dexmedetomidine hydrochloride for esophageal endoscopic submucosal dissection [J]. Dig Endosc, 2016, 28(2): 145-151
- [23] Jiang W, Wang Q, Xu M, et al. Assessment of different loading doses of dexmedetomidine hydrochloride in preventing adverse reaction after combined spinal-epidural anesthesia [J]. Exp Ther Med, 2017, 13 (6): 2946-2950
- [24] 惠愚,杨怡,吉恩秀,等.右美托咪定联合瑞芬太尼对结肠癌患者术后认知功能及血流动力学的影响 [J]. 中国药房, 2017, 28(8): 1101-1104
- Qu Hui, Yang Yi, Ji En-xiu, et al. Effects of Dexmedetomidine Combined with Remifentanyl on Postoperative Cognition and Hemodynamics in Patients Underwent [J]. China Pharmacy, 2017, 28 (8): 1101-1104
- [25] Reade MC, Eastwood GM, Bellomo R, et al. Effect of Dexmedetomidine Added to Standard Care on Ventilator-Free Time in Patients With Agitated Delirium: A Randomized Clinical Trial [J]. JAMA, 2016, 315(14): 1460-1468
- [26] Mondal S, Ghosh S, Bhattacharya S, et al. Comparison between dexmedetomidine and fentanyl on intubation conditions during awake fiberoptic bronchoscopy: A randomized double-blind prospective study[J]. J Anaesthesiol Clin Pharmacol, 2015, 31(2): 212-216
- [27] Sayed E, Yassen KA. Intraoperative effect of dexmedetomidine infusion during living donor liver transplantation: A randomized control trial[J]. Saudi J Anaesth, 2016, 10(3): 288-294
- [28] 荆双凤,郑丽宏,郑丽坤,等.盐酸右美托咪定在术后镇痛中的应用 [J].现代肿瘤医学, 2017, 25(12): 2008-2010
- Jing Shuang-feng, Zheng Li-hong, Zheng Li-kun, et al. Application of dexmedetomidine on postoperative analgesia [J]. Journal of Modern Oncology, 2017, 25(12): 2008-2010
- [29] Choi JW, Joo JD, Kim DW, et al. Comparison of an Intraoperative Infusion of Dexmedetomidine, Fentanyl, and Remifentanyl on Perioperative Hemodynamics, Sedation Quality, and Postoperative Pain Control[J]. J Korean Med Sci, 2016, 31(9): 1485-1490
- [30] Zhang H, Fang B, Zhou W. The efficacy of dexmedetomidine-remifentanyl versus dexmedetomidine-propofol in children undergoing flexible bronchoscopy: A retrospective trial [J]. Medicine (Baltimore), 2017, 96(1): e581
- (上接第 531 页)
- [28] 姚芳苒,黄自坤,李雪,等.系统性红斑狼疮患者外周血中性粒细胞 PD-L1 表达和临床意义 [J]. 安徽医科大学学报, 2017, 52(5): 740-745
- Yao Fang-yi, Huang Zi-kun, Li Xue, et al. Expression of programmed death ligand-1 on neutrophils from the patients with SLE and its clinical significance [J]. Acta Universitatis Medicinalis Anhui, 2017, 52 (5): 740-745
- [29] Zhu Q, Cai MY, Chen CL, et al. Tumor cells PD-L1 expression as a favorable prognosis factor in nasopharyngeal carcinoma patients with pre-existing intratumor-infiltrating lymphocytes[J]. Oncoimmunology, 2017, 6(5): e1312240
- [30] 刘志华,叶云林,卞军,等.负性共刺激分子 PD-L1 在非肌层浸润性膀胱癌的表达及其对术后膀胱灌注治疗的影响[J].中山大学学报 (医学科学版), 2015, 36(2): 221-226
- Liu Zhi-hua, Ye Yun-lin, Bian Jun, et al. Effect of Negative Costimulatory Molecule PD-L1 on Intravesical Instillation Therapy in Non-muscle Invasive Bladder Cancer after Surgery[J]. Journal of Sun Yat-sen University(Medical Sciences), 2015, 36(2): 221-226