Effect of Dexmedetomidine Combined with Thoracic Paravertebral Block on Pain and Cognitive Function after Thoracotomy

XIAO Fan, LUO Zhen-zhong, ZHOU Bin, HUA Fu-zhou, HUANG Dan
(Department of Anesthesiology, the Second Affiliated Hospital of Nanchang University, Nanchang 330006, China)

ABSTRACT: Objective To investigate the effect of dexmedetomidine combined with thoracic paravertebral block (TPVB) on pain and cognitive function after thoracotomy. Methods Sixty male geriatric patients scheduled for radical surgery for esophageal carcinoma were randomly divided into three groups: general anesthesia group (group C), ropivacaine group (group R) and dexmedetomidine + ropivacaine group (group DR). The group DR was given intravenous infusion of 1 μg • kg⁻¹ dexmedetomidine within 10 minutes before general anesthesia induction. Both group R and group DR received TPVB (T₁–T₅) before general anesthesia induction. In addition, group R was given paravertebral injection of 30 mL 0.5% ropivacaine, and group DR was given 30 mL mixture of 0.5% ropivacaine and 0.5 μg • kg⁻¹ dexmedetomidine. All the three groups received postoperative patient-controlled intravenous analgesia (PCA). Heart rate (HR) and mean arterial pressure...
(MAP) were recorded before dexmedetomidine administration (T₀), before analgesia induction (T₁), 2 hours after incision (T₂), at the end of operation (T₃), and 1, 6, 12, 24, 36 and 48 hours after operation (T₄–₉). The resting and coughing VAS scores were measured at T₁–₉. The amount of anesthetics was recorded during operation and PCA pressing frequency was determined within 48 hours after operation. Venous blood samples were collected at T₀, T₁, T₂, T₃, and T₄, and serum interleukin-6 (IL-6), tumor necrosis factor-α (TNF-α) and s100β levels were detected by ELISA. The mini-mental state examination (MMSE) score was measured at T₀, T₁, T₃, and T₅. Results Compared with T₀, HR and MAP at T₁ were decreased in group DR. HR at T₄–₉ and serum IL-6, TNF-α and s100β levels at T₂, T₃, T₄ and T₅ were increased but MMSE scores at T₁ and T₅ were reduced in group C. and serum IL-6 and TNF-α levels at T₂ and T₅ were elevated in both group C and group DR (P<0.05). Compared with group R, VAS scores at T₁–₉, serum IL-6, TNF-α and s100β levels at T₂, T₃, T₄ and T₅, the amount of propofol and remifentanil and postoperative PCA pressing frequency were increased in group C. but VAS scores at T₁–₉, MMSE scores at T₂ and T₅, the amount of propofol and remifentanil, PCA pressing frequency and serum IL-6 and TNF-α levels at T₁, T₃, T₄ and T₅ were decreased in group DR (P<0.05). Conclusion Intravenous and regional dexmedetomidine administration combined with thoracic paravertebral block can relieve pain stress reaction and improve early cognitive function after thoracotomy.

KEY WORDS: dexmedetomidine; thoracic paravertebral block; thoracotomy; postoperative pain; postoperative cognitive function
麻醉药物用量及术后晕

1.3 

1.4 

VAS 

SPSS 18.0 

1.5 

2 

2.1 

*P<0.05 

2.2 

R 

1 mmHg=0.133 kPa.
与患者自身病理生理改变及麻醉等因素诱发中枢神经系统病变有关，表明随着快速康复外科(PoC)技术的发展，手术创伤与疼痛应激使机体产生强烈的炎症反应并最终诱发神经细胞损伤与凋亡。

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<th>组别</th>
<th>n</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
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<tr>
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<td>2.1±0.41</td>
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<td>2.3±0.50</td>
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<td>2.1±0.75</td>
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<td>20</td>
<td>0.37±0.07</td>
<td>0.35±0.07</td>
<td>0.32±0.06</td>
<td>0.30±0.12</td>
<td>0.30±0.12</td>
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<tr>
<td>DR</td>
<td>20</td>
<td>1.95±0.10</td>
<td>1.95±0.10</td>
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<td>1.95±0.10</td>
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* P<0.05

### 表 4

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* P<0.05

### 表 5

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<td>24.5±3.8</td>
<td>25.2±3.1</td>
<td>27.6±2.2</td>
<td>27.6±2.2</td>
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<tr>
<td>R</td>
<td>20</td>
<td>28.5±3.0</td>
<td>24.5±3.8</td>
<td>25.2±3.1</td>
<td>27.6±2.2</td>
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<tr>
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</table>

* P<0.05

### 3

 ERAS (ERAS) • Dex • POCD • P O C D • TPVB

### 4

 IL-6, TNF-α, s100β

### 5

 MMSE

### 6

 POCD

### 7

 C • R • DR • TPVB • MMSE
大剂量的局麻药存在引起神经毒性损伤的风险。抑制作用下降及因可产生协同作用，术后加了感染风险以及降低了患者舒适度。胸术后疼痛应激反应，疼痛及早期认知功能影响。自控给药次数减少，显著延长局麻药的阻滞时间。而局部复合一定剂量的罗哌卡因还难以完全满足术后镇痛要求。疼痛评分只在术毕，术后早期认知功能，说明复合应用在术后。胸椎旁神经阻滞可减轻老年患者开胸术后疼痛。避免了术中持续静脉输注。而局部复合一定剂量的罗哌卡因还难以完全满足术后镇痛要求。疼痛评分只在术毕，术后早期认知功能，说明复合应用在术后。胸椎旁神经阻滞可减轻老年患者开胸术后疼痛。避免了术中持续静脉输注。

【参考文献】