Dohren et al. 2014

Pretorius gabapentin for the prevention of persistent pain after thoracotomy: A randomized controlled trial.


**Inclusion criteria**
- Age ≥ 18 yrs
- Pulmonary malignancy scheduled for anterior thoracotomy

**Exclusion criteria**
- Ability to fill in detailed health- and pain-related questionnaires
- Psychiatric disease
- Serum creatinine concentrations ≥120 μmol/L
- Allergy to gabapentin, morphine, bupivacaine and/or 
- Ibuprofen
- Average pain during the last week ≥4 NRS
- Standardized treatment with opioids - anticonvulsants

**Demographic data**
- Group P: Group G
- Age (yrs)
- Weight (kg)
- BMI (kg/m²)
- Total patient number included: 146
- Analysed: 137
- Excluded: 9

**Patient flow and follow up**
- 104 randomized in:
  - Group G
  - Group P
- 37 excluded
- 77 randomized
- Follow up: postop days 1-5, 3 months, 6 months

**Intervention group to control group**

**Postoperative pain in 24 h**
- Group P: n (%) 37, Group G: n (%) 38
- Pain score: Mean 3.0, SD 1.8
- Difference: 1.0 mg (95% CI 0.0-2.0 mg)

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**Critical appraisal/Conclusion**

**Methodological shortcomings**
- No details on implementation of randomisation
- Level of evidence: 1 authors’ conclusion
  - We found no evidence for the superiority of gabapentin over placebo for the treatment of acute pain following thoracotomy or for the prevention of persistent post-thoracotomy pain.

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Kinney et al. 2012

Pretorius gabapentin for acute post-thoracotomy analgesia: a randomized, double-blind, active placebo-controlled study.


**Inclusion criteria**
- Age: 45–75 years
- Pulmonary malignancy
- Planned chest wall resection
- Cardiovascular surgery
- Gastroesophageal surgery
- Current enrollment in another post-thoracotomy analgesic research protocol
- Pre-existing pain syndromes
- Daily opioid therapy >20 mg oral morphine equivalents
- Current gabapentin or pregabalin therapy
- Allergy to any study medication
- Coagulation or infectious issues that would preclude epidural catheter placement
- Severe hepatic, renal or cardiovascular disorders

**Demographic data**
- Group GABA: n = 65
- Group C: n = 63
- Age (yrs)
- Weight (kg)
- Height (cm)
- BMI (kg/m²)
- Total patient number included:
  - Group GABA: n = 65
  - Group C: n = 63

**Intervention prior to anaesthesia**
- Group GABA: 660 mg PO gabapentin 2 h preop
- Group C: Placebo (diphendramine 12.5 mg) same protocol

**Postoperative pain (NRS): mean (SD)**
- Group P: 2.5 ± 1.8
- Group C: 5.1 ± 2.2
- Difference: 2.5 (95% CI 1.0-4.0 mg)

**Critical appraisal/Conclusion**

**Methodological shortcomings**
- Method used to allocate random sequence not reported
  - Allocation concealment not reported
  - Date defining period of recruitment and follow up not reported
  - Level of evidence: 1 Authors’ conclusion
  - “A single preoperative oral dose of gabapentin (600 mg) did not reduce pain scores or opioid consumption following elective thoracotomy and, did not confer any analgesic benefit in the setting of effective multimodal analgesia that included thoracic epidural infusions.”

**Reference**

- **Participants' characteristics**
- **Intervention group / control group**
- **Outcomes**
- **Critical appraisal / conclusion**

<table>
<thead>
<tr>
<th>Group</th>
<th>Patients (n)</th>
<th>Excluded</th>
<th>Analysed</th>
<th>Follow-up (VAS scores at 3 months PO)</th>
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<tbody>
<tr>
<td>C</td>
<td>63</td>
<td>24</td>
<td>120</td>
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</table>

**Inclusion criteria**
- Age 18–80 yrs
- ASA physical status II–III

**Exclusion criteria**
- History of drug or alcohol abuse
- Unable to understand a numerical rating scale (NRS)
- Patient flow and follow up:

<table>
<thead>
<tr>
<th>Group</th>
<th>Total patient number included</th>
<th>Randomised</th>
<th>Excluded</th>
<th>Analysed</th>
<th>Follow-up: 0, 2, 4, 8, 12, 16, 20, 24 h postop</th>
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<tbody>
<tr>
<td>G</td>
<td>23</td>
<td>20</td>
<td>3</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>28</td>
<td>22</td>
<td>6</td>
<td>22</td>
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</tr>
</tbody>
</table>

**Intervention prior to anaesthesia**
- Group G: 1200 mg PO gabapentin 2 h before surgery
- Group P: placebo, same protocol

**Mode of anaesthesia**
- TEA
- Fentanyl

**Surgical approach**

<table>
<thead>
<tr>
<th>Group</th>
<th>Type of surgery</th>
<th>Group G</th>
<th>Group P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Pneumonectomy</td>
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<td>2</td>
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<tr>
<td>Lobectomy</td>
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<td>17</td>
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<tr>
<td>Segmentectomy/Wedge/biopsy</td>
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<tr>
<td>Exploratory</td>
<td>0</td>
<td>3</td>
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</table>

**Supplemental analgesia**
- Rescue analgesia: 1–2 mg sc hydromorphone every 4–6 h
- If NRS>3 at incision site:
  - Infusion of 0.1 mL/kg/h of epidural solution + infusion rate increased in 2 mL/h increments, to max infusion rate of 16 mL/h
  - If still in pain, the epidural solution was changed to 0.125% bupivacaine (0.125%) + 2 μg/mL fentanyl at 10 mL/h

**Postoperative analgesia**
- Pre-treatment: buvueacaine 0.1% + fentanyl 2 μg/mL at an initial rate of 0.1 mL/kg/h. Adjustments were made between 4–16 mL/h + boluses of 0.1 mL/kg
- Postop: TEA: infusion rate adjusted to maintain an NRS pain score ≤3 at the surgical site

**Postoperative pain (NRS 0-10; median [range])**

<table>
<thead>
<tr>
<th>Group</th>
<th>0 h</th>
<th>Rest</th>
<th>Cough</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>P</td>
<td>0.5</td>
<td>0.7</td>
<td>0.7</td>
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</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>4 h</th>
<th>Rest</th>
<th>Cough</th>
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<tbody>
<tr>
<td>G</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>P</td>
<td>0.5</td>
<td>0</td>
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<table>
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<th>Rest</th>
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<tbody>
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<td>0.7</td>
<td>0</td>
</tr>
<tr>
<td>P</td>
<td>0</td>
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<table>
<thead>
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<th>Rest</th>
<th>Cough</th>
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<tbody>
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<td>0.5</td>
</tr>
<tr>
<td>P</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
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<table>
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<th>Rest</th>
<th>Cough</th>
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</thead>
<tbody>
<tr>
<td>G</td>
<td>0.5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>P</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

**Total dosage of hydromorphone mg/24 h; mean±SD**
- Group G: 2.36±2.5
- Group P: 2.65±3.2

**Adverse effects / events: n (%)**
- No significant difference between groups in nausea, vomiting and pruritis
- Sedation at 4 h:
  - Group G (21/23 patients)
  - Group P (18/28 patients; p=0.025)

**Methodological shortcomings**
- Participant flow through each stage was not reported

**Level of evidence:** 1

**Authors' conclusion**

"Pre-emptively administered gabapentin, 1200 mg, does not reduce the incidence, or the severity of post-thoracotomy shoulder pain in patients receiving thoracic epidural analgesia"