Gabapentinoids as a Part of Multi-modal Drug Regime for Pain Relief following Laparoscopic Cholecystectomy: A Randomized Study

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Abstract

Background:
Gabapentinoids have been used as preemptive analgesics for pain management following laparoscopic cholecystectomy. Recently, multimodal analgesic techniques have been found superior to preemptive analgesia alone.

Aim:
The aim of this study is to evaluate and compare a single preoperative dose of pregabalin 150 mg and gabapentin 300 mg for pain relief following laparoscopic cholecystectomy as a part of multimodal drug regime.

Settings and Design:
This randomized, single-blind study was conducted after Ethical Committee approval and written informed consent from the patients.

Materials and Methods:
Fifty patients undergoing laparoscopic cholecystectomy under general anesthesia were randomly allocated to receive either 150 mg pregabalin (Group PG), or 300 mg gabapentin (Group GB) orally, 2 h before surgery. Standard anesthesia induction and maintenance were done. For intraoperative pain management, injection fentanyl 2 µg.kg⁻¹ intravenous (IV) along with injection voveran 75 mg IV and port site infiltration was used. Postoperatively, injection diclofenac 75 mg intramuscular TDS was continued. Severity of postoperative pain (visual analog scale [VAS]), postoperative fentanyl requirement and incidence, and severity of side effects were assessed. When VAS >40 mm or on patient's request, a Fentanyl bolus at an increment of 25–50 µg IV was given as rescue analgesia.

Results:
Intraoperative fentanyl requirement was 135 ± 14 µg in Group PG and 140 ± 14 µg in Group GB (P = 0.21). Postoperative, fentanyl requirement was 123 ± 18 µg in Group PG and 131 ± 23 µg in Group GB (P = 0.17) There was no statistically significant difference in the VAS score for static and dynamic pain. Time to the first requirement of analgesic was 5.4 ± 1.1 h in Group PG and 4.6 ± 1.6 h in Group GB (P = 0.015). No side effects were observed.

Conclusion:
We conclude that a single preoperative dose of pregabalin (150 mg) or gabapentin (300 mg) are equally efficacious in providing pain relief following laparoscopic cholecystectomy as a part of multimodal drug regime without any side effects.

Keywords: Gabapentin, laparoscopic cholecystectomy, multi-modal analgesia, pregabalin

INTRODUCTION

Multimodal analgesic techniques have gained popularity for postoperative pain management. The major advantage being superior pain control with reduced side effects as opioids consumption is decreased. Drugs used include nonsteroidal anti-inflammatory drugs, selective cyclooxygenase-2 inhibitors, N-methyl-D-aspartate antagonists, alpha-2 adrenergic agonists, gabapentinoids, and local anesthetic injection at the surgical site.

Gabapentinoids drugs (gabapentin and pregabalin) were developed originally as anticonvulsants and subsequently found to be effective in neuropathic and postoperative pain management.

Pregabalin compared to gabapentin has better pharmacokinetic profile with rapid absorption, higher bioavailability, and less intersubject variability. Animal studies show that pregabalin is 3–10-folds more potent than gabapentin as an epileptic and 2–4-fold more potent as an anticonvulsant.
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There are no conflicts of interest.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.
Acknowledgment

Authors would like to thank the Department of Surgery, Hamdard Institute of Medical Sciences and Research, Jamia Hamdard, New Delhi, India.

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**Figures and Tables**
### Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group PG</th>
<th>Group GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>37.43±4.8</td>
<td>39.01±8.2</td>
</tr>
<tr>
<td>Sex (male-female)</td>
<td>21.4</td>
<td>20.5</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>52.90±6.2</td>
<td>55.12±6.3</td>
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<tr>
<td>Duration of surgery (h)</td>
<td>0.94±0.2</td>
<td>1.03±0.3</td>
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</tbody>
</table>

No significant difference observed (P>0.05). PG=Pregabalin, GB=Gabapentin

Demographic data and duration of surgery (mean±standard deviation)
Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group PG</th>
<th>Group GB</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intraoperative fentanyl requirement (µg)</td>
<td>135.50±14.3</td>
<td>140.50±14.1</td>
<td>0.212</td>
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<td>Postoperative fentanyl requirement (µg)</td>
<td>123.74±18.5</td>
<td>131.93±23.2</td>
<td>0.17</td>
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<tr>
<td>Time to rescue analgesia (h)</td>
<td>5.48±1.12</td>
<td>4.68±1.61</td>
<td>0.015*</td>
</tr>
</tbody>
</table>

*Statistically significant difference. PG=Pregabalin, GB=Gabapentin

Fentanyl requirement and time to first analgesic request (mean±standard deviation)
Postoperative visual analog scale (static pain). No statistically significant difference in visual analog scale (static pain) at all intervals.
Figure 2

Postoperative visual analog scale (dynamic pain). No statistically significant difference in visual analog scale (dynamic pain) at all intervals.
Time to rescue analgesia. The difference was statistically significant ($P = 0.015$)