Can Lidocaine Reduce Rocuronium Induced Postoperative Myalgia?

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Introduction

Rocuronium (a non-depolarizing agent) is con-
sidered by many to be the best drug for providing ideal intubation conditions and rapid sequence induction. However, in addition to a number of infrequent, but un-
toward effects, its usefulness is limited by the occurrence of postoperative myalgia. This is often listed as a minor
adverse effect but it may be a very distressing experience for the patient.

In general, non-depolarizing agents will not produce myalgia, but our previous report shows that the incidence of rocuronium-induced myalgia is 31.1%. The duration of the discomfort is highly variable. It usually lasts for 2 or 3 days but occasionally persists for as long as a week. It usually appears on the first day after surgery, is most commonly described as the pain one might suffer after an unaccustomed degree of physical exercise, and is usually located in the neck, shoulder and upper abdominal muscles. Although self-limiting, it is generally agreed that iatrogenic postoperative myalgia is unacceptable in modern anesthetic practice. In order to summarise the studies in the literature about the efficacy of pretreatment regimens in reducing postoperative myalgia, lidocaine significantly decreased the frequency of myalgias by about 30%.

The primary objective of this study was to study the efficacy of lidocaine for reducing rocuronium induced postoperative myalgia in Thai women who had undergone gynecological operations. The secondary objective was aimed at the comparison of the hemodynamic response with and without lidocaine pretreatment.

Materials and Methods

We studied 186 ASA physical status I and II patients, aged 15-70 yrs, after obtaining Institutional Review Board Ethics Committee approval and written informed consent. All patients were scheduled for elective gynecological surgery lasting about 1-3 hours with tracheal intubation being required. Patients with risk of aspiration, difficult airway management, cervical pathology, musculoskeletal disease or contraindication to rocuronium or lidocaine were excluded.

Each patient was assigned to one of two groups in a prospective, double blind, randomized manner. Group PR, the control group, received normal saline and rocuronium 0.6 mg/kg; Group LR, lidocaine 1.5 mg/kg and rocuronium 0.6 mg/kg. Both pretreatment medication and intubation agents were administered in a double-blind fashion from syringes containing solutions diluted to the same volume.

All patients received morphine 0.1 mg/kg iv. for premedication and were monitored with a noninvasive blood pressure, ECG and pulse oximetry monitors. Anesthesia was induced with 5 mg/kg thiopental iv. followed by rocuronium for intubation. Anesthesia was maintained with nitrous oxide 66% in oxygen, halothane 0.5-1%, pancuronium with incremental doses of morphine given as required. Noninvasive blood pressure, heart rate, ECG and pulse oximetry were recorded at base line, after premedication, induction, intubation and every 2 min until 10 min after intubation.

Twenty-four hours post operation, one of the authors, blinded to the intraoperative management, assessed the myalgia according to a structured questionnaire and graded it on a four point scale describe by White: 0 (nil) no pain ; 1 (slight) pain at one site but not causing disability ; 2 (moderate) pain at more than one site but not causing disability ; 3 (severe) pain at more than one site and causing disability.

Statistical analysis

Continuous data are presented as mean ± standard deviation and categorical variables are presented as frequencies and percentages. Comparisons of the categorical data among the two groups were performed using a chi-square test. Student t-test was employed to compare continuous variables among the two groups.

All statistical analysis were performed using SPSS/PC Version 10.0. A 2 sided p-value of less than 0.05 was considered statistically significant.

Results

One hundred and eighty-six Thai women were studied. The basic characteristics of the patients in both groups were comparable as shown in Table 1.
Table 1  Demographic data

<table>
<thead>
<tr>
<th></th>
<th>PR Control group</th>
<th>LR Lidocaine group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>93</td>
<td>93</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>38.5 ± 10.8</td>
<td>40.6 ± 8.6</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>54.7 ± 8.8</td>
<td>54.4 ± 10.2</td>
</tr>
<tr>
<td>Heigh (cm)</td>
<td>156.4 ± 5.4</td>
<td>154.6 ± 5.5</td>
</tr>
<tr>
<td>ASA (%) I</td>
<td>78.5</td>
<td>89.2</td>
</tr>
<tr>
<td></td>
<td>21.5</td>
<td>10.7</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SD, n (percentage)

Table 2  Postoperative myalgia

<table>
<thead>
<tr>
<th>Data</th>
<th>PR (%)</th>
<th>LR (%)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>61 (65.6%)</td>
<td>67(72.0 %)</td>
<td>0.580</td>
</tr>
<tr>
<td>Mild</td>
<td>23(24.7%)</td>
<td>20(21.5%)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>7(7.7%)</td>
<td>4(4.5%)</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>2(2%)</td>
<td>2(2%)</td>
<td></td>
</tr>
</tbody>
</table>

* Combined moderate and severe
Values are expressed as n (percentage)

At 24 hrs, 34.4% of the patients in Group PR had myalgia compared with 28% in Group LR (Table 2). The difference between the two groups was not statistically significant (p = 0.58).

The changes in systolic and diastolic blood pressure and heart rate were not different among the two groups (Figure 1-3). No separate adverse effects were noted in this study.

Discussion
Rocuronium-induced muscle pain is not a common problem in surgical patients. It has recently been reported to occur in around 30%. The reasons for this are not completely known but may be due to more vigorous use of muscles in early ambulation, or use of lower potency analgesics. Whatever the reasons, it is important to determine the most effective way to decrease these muscle pains.

An attempt to reduce the incidence and severity of muscle pain has been carried out. In order to summarise the studies in the literature about the efficacy of pretreatment regimens in reducing post operative myalgia, a
meta-analysis of agents that prevent post operative myalgia has been published. Three classes of preventive drugs with typical doses have been quoted: nondepolarizing neuromuscular blockers, benzodiazepines (diazepam), and local anesthetics (lidocaine) significantly decreased the frequency of myalgias by about 30%. All pretreatments that were shown to be effective in the meta-analysis were shown to have statistically significant effects in lowering the incidence of myalgia and that, with the available indirect evidence, lidocaine was the best pretreatment to prevent postoperative myalgia. Melnick et al. using 1.5 mg/kg lidocaine 15 to 30 seconds before succinylcholine was given found it to be effective against postoperative myalgia.

The mechanism of action of lidocaine in decreasing myalgias is only speculative. It was not the purpose of this study to investigate it. We used 0.6 mg/kg rocuronium, the dose recommended when lidocaine is used for pretreatment, and found no obvious effect on intubating conditions.

The mechanism by which rocuronium produces postoperative muscle pain is still not fully understood, although the drug has been in routine clinical use for many years. The mechanism of postoperative myalgia may be complex, involving many steps that can be used as clinical targets for different pretreatment agents. The use of nondepolarizing neuromuscular blockers with a rapid onset of action and a short duration of clinical effect for intubation produce very little post operative muscle pain compared with succinylcholine.

In our study, pretreatment with lidocaine was not effective in reducing rocuronium induced myalgia. The changes in the heart rate or blood pressure were the same in both groups. Problems due to bolus injection of lidocaine such as central nervous system toxicity or hemodynamic alteration were not noticed clinically.

**Conclusion**

Lidocaine has not proven to be a useful pretreatment agent for reducing the incidence of rocuronium induced post operative myalgia.

**References**


Comparison of Dose Requirement of Diluted and Undiluted Propofol for Patients Undergoing ERCP

Abstract: Comparison of Dose Requirement of Diluted and Undiluted Propofol for Patients Undergoing ERCP
Amornyotin S, M.D.,* Suraseranivongse S, M.D.,* Muangman S, M.D.,* Sattawattharmrong Y, M.D.,** Tensit K, M.D.,* Prakotsue K, M.D.,* Chalayonnawin W, B.N.*
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Two hundred and eighteen patients were assigned to one of three groups in a prospective, double blind, randomized manner. Group U, the control group, received undiluted propofol (10 mg/ml); Group D1, diluted propofol (5 mg/ml); Group D2, diluted propofol (2.5 mg/ml). All patients were topicalized with 2% viscous lidocaine and 10% lidocaine spray for topical anesthesia and pethidine 0.5 mg/kg, midazolam 0.05 mg/kg and propofol 1 mg/kg for premedication and induction. Anesthesia was maintained with continuously intravenous infusion of titratable propofol. Blood pressure, heart rate, ECG, oxygen saturation at baseline, after premedication, immediately and every 5 minutes after induction, total dose of propofol, duration of anesthesia and complications were recorded. The results of the study showed that total doses and dose requirement of propofol and complications in Group U were higher than that of Group D1 and D2 with a statistically significant level of α < 0.001. It can be concluded that diluted propofol is safe and effective for the patients who have been undergoing ERCP.