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CORRESPONDENCE

Intubation using lidocaine, low dose rocuronium, remifentanil and propofol—what should we know?

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To the Editor,

We read with interest the excellent article by Siddik-Sayyid *et al.*[1] describing the use of lidocaine 1.5 mg · kg^{-1}, rocuronium 0.3 mg · kg^{-1}, and remifentanil 2 μg · kg^{-1} followed by propofol 2 mg · kg^{-1} *iv* for tracheal intubation and reporting excellent intubating conditions in 90% of patients. The authors stated that this technique could be applied to brief surgical procedures or whenever the anticipated duration of surgery is uncertain.[1] Using an ultra-short-acting opioid and a low dose of a non-depolarizing neuromuscular blocking drug (NMBD) is ideal for ambulatory surgery where rapid recovery is essential. There are also some patient groups that are especially sensitive to muscle relaxants, such as those with myasthenia gravis, myositis, or Guillain Barré syndrome, who might benefit from using this technique.

Siddik-Sayyid *et al*. did not include a control group in their study, and it remains unclear whether the tracheal intubating conditions would have deteriorated had rocuronium been omitted. However, Taha *et al*. used a similar medication sequence and dose regimen (lidocaine 1.5 mg · kg^{-1}, remifentanil 2 μg · kg^{-1}, propofol 2 mg · kg^{-1}) and reported that 84% of patients had excellent intubating conditions compared with 90% of patients in the Siddik-Sayyid *et al.* study.[1,2] When deciding whether to use a muscle relaxant to facilitate tracheal intubation, one should take into account that omitting neuromuscular blocking drugs (NMBDs) can increase the frequency of poor intubating conditions. The recent Danish study of Lundstrom *et al*. found that avoiding NMBDs may increase the risk of difficult tracheal intubation, although further investigation is needed.[3]

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It is also important to bear in mind that rocuronium injection may cause severe pain.[4] Therefore, whenever rocuronium is considered to be the NMBD of choice and when it is to be administered according to the "timing principle" (administration before the induction agent in order to decrease the effective onset time), lidocaine should be used prior to rocuronium.

The technique of lidocaine + low-dose rocuronium + remifentanil + propofol encompasses several issues. Lidocaine blunts the pressor response to laryngoscopy; it suppresses the cough reflex and decreases the remifentanil dose needed to improve tracheal intubating conditions and also prevents rocuronium injection pain.[4,5] Remifentanil is effective as a co-induction agent, and it also blunts the pressor response.[5] A low dose of rocuronium administered before the induction agent is usually sufficient to improve intubating conditions while having a short duration of action. Reducing the doses of remifentanil and propofol and prolonging the injection time of these drugs will help to ensure hemodynamic stability for the elderly and more medically complex patients during the induction of anesthesia.

Competing interests None declared.

References

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Reply

We thank Dr. Uvelin and his colleagues for their interesting comments regarding our study. In a previous study, Taha *et al*. used the same medications (lidocaine, remifentanil, propofol) and found that 84% of patients had excellent intubating conditions.[1] However, the time of drug administration and time to intubation differed between the two studies: In the study by Taha *et al*., midazolam 0.03 mg · kg^{-1} was given intravenously 5 min before induction of anesthesia. Patients then received lidocaine 1.5 mg · kg^{-1} *iv* over 5 sec followed by remifentanil 2 μg · kg^{-1} *iv* over 30 sec, and propofol 2 mg · kg^{-1} *iv* over 20 sec. Ninety seconds after propofol administration, laryngoscopy and tracheal intubation were attempted (total induction time 145 sec). In our study, no premedication was given. Patients in both groups received lidocaine 1.5 mg · kg^{-1} over 5 sec. Immediately thereafter, patients in the rocuronium group received rocuronium 0.3 mg · kg^{-1} over 5 sec, then remifentanil 2 μg · kg^{-1} and propofol 2 mg · kg^{-1} infused simultaneously over 30 sec. In the succinylcholine group, after receiving lidocaine, the remifentanil–propofol combination was given to study subjects in the same manner as in the rocuronium group, followed by succinylcholine 1.5 mg · kg^{-1} administered over 5 sec. Laryngoscopy was performed 60 sec after administration of remifentanil in the rocuronium group and 60 sec after the end of administration of succinylcholine in the succinylcholine group. Total induction time in both groups was 100 sec. Small variations in either the technique or timing may achieve different results; tracheal intubating conditions depend not only on the anesthetic induction technique but also on the interval between drug administration and laryngoscopy, which ideally should coincide with the peak effect of each anesthetic drug. In the study by Taha *et al*., the induction-intubation interval was sufficiently long (145 sec *vs* 100 sec) to allow optimal time for the anesthetic drugs to reach peak effect at the time of laryngoscopy. Had Taha *et al*. applied our induction sequence, a different incidence of excellent intubating conditions might have been observed. Furthermore, the results observed by Taha *et al*. are at variance with results from previous studies[2,3] that compared intubating conditions using remifentanil (2–4 μg · kg^{-1}) and propofol without muscle relaxants. Excellent intubating conditions were achieved in only 50–60% of patients in those studies compared with 90% of patients in our report.

Other differences in study protocols may also account for the differences in the results between studies. Finally, since we did not include a control group, we agree that it is valid to question whether the intubating conditions would deteriorate had rocuronium been omitted. One can speculate that intubating conditions similar to those with succinylcholine may be achieved using a similar induction regimen without rocuronium.

Finally, we recognize that the dose of remifentanil and propofol we evaluated may be excessive in the elderly and in patients with cardiovascular or cerebrovascular disease. For these patients, reduced drug doses and/or slower administration rates are warranted.

Competing interests None declared.

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