



REVISTA BRASILEIRA DE ANESTESIOLOGIA

Publicação Oficial da Sociedade Brasileira de Anestesiologia
www.sba.com.br



LETTER TO THE EDITOR

Is there still an indication for the use of succinylcholine in cesarean section? The answer is no



Será que ainda existe uma indicação para o uso de succinilcolina em cesariana? A resposta é não

Dear Editor,

In a recent trial by Stourac et al., it was discussed whether rocuronium and sugammadex confer benefit in time to tracheal intubation and other Neuromuscular Blockade (NMB) outcomes compared with succinylcholine, rocuronium, and neostigmine in women undergoing general anesthesia for cesarean delivery.¹ The authors' conclusion was that rocuronium for rapid sequence induction is noninferior regarding the time needed for intubation. Furthermore, there was more frequent absence of resistance during laryngoscopy and less myalgia compared with the use of succinylcholine. Well, nothing new so far, but still there is a discussion whether we should use succinylcholine or rocuronium in cesarean section undergoing general anesthesia.

Benumof et al. predicted, based on calculations, a healthy 70 kg adult patient after a succinylcholine 1.0 mg.kg⁻¹ induced apnea, the SatO₂ will start to decrease to less than 90% after approximately 8 min. However, the physiology compared with healthy patients is changed during pregnancy.² As pregnancy progresses, oxygen consumption continues to increase, and cardiac output increases to a lesser extent, resulting in a reduced mixed venous oxygen content and increased arteriovenous oxygen difference. After mid gestation, pregnant women in the supine position frequently have a PaO₂ less than 100 mmHg (13.3 kPa).³ This occurs because the Functional Residual Capacity (FRC) may be less than closing capacity, resulting in closure of small airways during normal tidal volume ventilation. As a consequence of these physiological changes, obstetric patients have shorter apnoea time compared to non-obstetric patients. In addition, the risk of difficult intubation is 5–10 times greater in term pregnancy.¹ Therefore, airway management in obstetric patients is challenging.

Succinylcholine has so many side effects that they can be classified according to mechanism of action as: depolarisation of the endplate and muscle; agonistic actions at other nicotinic sites; muscarinic effects; abnormal

breakdown; idiosyncratic actions; drug interactions; changing nature of block after prolonged use. Taha et al. showed that when succinylcholine is administered for rapid sequence induction of anaesthesia, a faster onset of oxygen desaturation is observed during the subsequent apnea compared with rocuronium.⁴ The authors postulated that this rapid onset of desaturation may be attributed to the higher fasciculation score and fasciculation duration in this group. These two factors may be responsible for causing an increase in oxygen consumption. In this manner, avoiding fasciculation, replacing succinylcholine by rocuronium, is a way that can improve the safety margin (through longer apnoea time) during airway management in pregnant patients.

Reducing the dose of succinylcholine in order to avoid these effects is not a good alternative. Naguib et al. studied a reduction of the dose of succinylcholine from 1.0 mg.kg⁻¹ to 0.56 mg.kg⁻¹ in healthy normal weight patients.⁵ This study showed that oxygen saturation decreased <90% in 65% vs. 85% of the patients in the 0.56 mg.kg⁻¹ and 1.0 mg.kg⁻¹ succinylcholine group, respectively. Although there was a reduction in desaturation with the lower dose of succinylcholine, still a high percentage of patients showed a critical oxygen desaturation, putting these patients at risk in case of a difficult intubating situation.⁵

Therefore, we strongly believe that the use of the combination of rocuronium and sugammadex means an increase in the safety and quality of care to these obstetric patients. However, the additional cost of sugammadex might be a barrier for institutions to replace succinylcholine for rocuronium, but in our opinion the use of succinylcholine in cesarean sections might not longer be indicated.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Stourac P, Adamus M, Seidlova D, et al. Low-dose or high-dose rocuronium reversed with neostigmine or sugammadex for cesarean delivery anesthesia: a randomized controlled noninferiority trial of time to tracheal intubation and extubation. *Anesth Analg*. 2016;122:1536–45.
2. Benumof JL, Dagg R, Benumof R. Critical hemoglobin desaturation will occur before return to an unparalyzed state following 1 mg/kg intravenous succinylcholine. *Anesthesiology*. 1997;87:979–82.

3. Gaiser R. Physiologic changes of pregnancy. In: Chestnut D, Wong C, Tsen L, Ngan Kee W, Beilin Y, Mhyre J, editors. Chestnut's obstetric anesthesia principles and practice. Philadelphia: Elsevier Saunders; 2014. p. 15–38.
4. Taha SK, El-Khatib MF, Baraka AS, et al. Effect of suxamethonium vs rocuronium on onset of oxygen desaturation during apnoea following rapid sequence induction. *Anaesthesia*. 2010;65: 358–61.
5. Naguib M, Samarkandi AH, Abdullah K, et al. Succinylcholine dosage and apnea-induced hemoglobin desaturation in patients. *Anesthesiology*. 2005;102:35–40.

Ricardo Vieira Carlos^{a,*}, Marcelo Luis Abramides Torres^a, Hans Donald de Boer^b

^a *Faculdade de Medicina da Universidade de São Paulo (FMUSP), Hospital das Clínicas, Disciplina de Anestesiologia, São Paulo, SP, Brasil*

^b *Martini General Hospital Groningen, Department of Anesthesiology and Pain Medicine, Groningen, Netherlands*

* Corresponding author.

E-mail: ricardovieirac@gmail.com (R.V. Carlos).

Available online 17 April 2017

<http://dx.doi.org/10.1016/j.bjane.2016.09.011>
0104-0014/

© 2016 Sociedade Brasileira de Anestesiologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).