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SCIENTIFIC ARTICLE

Effect of gabapentin pretreatment on myoclonus after etomidate: a randomized, double-blind, placebo-controlled study

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KEYWORDS
Etomidate;
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Abstract
Aim: To evaluate the effects of three different doses of gabapentin pretreatment on the incidence and severity of myoclonic movements linked to etomidate injection.
Method: One hundered patients, between 18 and 60 years of age and risk category American Society of Anesthesiologists I–II, with planned elective surgery under general anesthetic were included in the study. The patients were randomly divided into four groups and 2 h before the operation were given oral capsules of placebo (Group P, $n = 25$), 400 mg gabapentin (Group G400, $n = 25$), 800 mg gabapentin (Group G800, $n = 25$) or 1200 mg gabapentin (Group G1200, $n = 25$). Side effects before the operation were recorded. After preoxygenation for anesthesia induction 0.3 mg kg^{-1} etomidate was administered for 10 s. A single anesthetist with no knowledge of the study medication evaluated sedation and myoclonic movements on a scale between 0 and 3. Two minutes after induction, 2 μg kg^{-1} fentanyl and 0.8 mg kg^{-1} rocuronium were administered for tracheal intubation.
Results: Demographic data were similar. Incidence and severity of myoclonus in Group G1200 and Group G800 were significantly lower than in Group P; sedation incidence and level were appreciably higher compared to Group P and Group G400. While there was no difference in the

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incidence of myoclonus between Group P and Group G400, the severity of myoclonus in Group G400 was lower than in the placebo group. In the two-hour period before induction other than sedation none of the side effects related to gabapentin were observed in any patient.
Conclusion: Pretreatment with 800 mg and 1200 mg gabapentin 2 h before the operation increased the level of sedation and reduced the incidence and severity of myoclonic movements due to etomidate.

PALAVRAS-CHAVE
Etomidato;
Dor à injeção;
Mioclonia;
Gabapentina

Efeito do pré-tratamento com gabapentina sobre a mioclonia após etomidato: um estudo randômico, duplo-cego e controlado por placebo

Resumo
Objetivo: Avaliar os efeitos de três doses diferentes de gabapentina como pré-tratamento sobre a incidência e gravidade dos movimentos mioclônicos associados à injeção de etomidato.
Método: Cem pacientes, com idades entre 18-60 anos, estado físico ASA I-II, programados para cirurgia eletiva sob anestesia geral foram incluídos no estudo. Os pacientes foram randomicamente divididos em quatro grupos e, 2 horas antes da operação, receberam cápsulas orais de placebo (Grupo P, n = 25), 400 mg de gabapentina (Grupo G400, n = 25), 800 mg de gabapentina (Grupo G800, n = 25) ou 1200 mg de gabapentina (Grupo G1200, n = 25). Os efeitos colaterais antes da cirurgia foram registados. Após pré-oxigenação para a indução da anestesia, etomidate (0,3 mg.kg^{-1}) foi administrado por 10 segundos. Um único anestesista, cego para a medicação do estudo, avaliou a sedação e os movimentos mioclônicos usando uma escala de 0 a 3. Dois minutos após a indução, fentanil (2 μgr.kg^{-1}) e rocurônio (0,8 mg.kg^{-1}) foram administrados para a intubação traqueal.
Resultados: Os dados demográficos foram semelhantes. A incidência e gravidade da mioclonia nos grupos G1200 e G800 foram significativamente menores que no Grupo P; a incidência e o nível de sedação foram consideravelmente maiores comparados ao Grupo P e Grupo G400. Enquanto não houve diferença na incidência de mioclonia entre os grupos P e G400, a gravidade da mioclonia no Grupo G400 foi menor que no grupo placebo. No período de 2 horas antes da indução, nenhum dos efeitos colaterais relacionados à gabapentina, exceto sedação, foi observado em qualquer paciente.
Conclusão: O pré-tratamento com 800 mg e 1200 mg de gabapentina 2 horas antes da operação aumentou o nível de sedação e reduziu a incidência e gravidade dos movimentos mioclônicos associados ao etomidato.

Introduction

Etomidate, a derivative of imidazole, is a popular hypnotic agent chosen for patients with cardiovascular instability due to minimal cardiovascular side effects and extremely stable hemodynamic profile. Myoclonus and injection pain are two disagreeable side effects of anesthesia induction with etomidate. As many side effects due to etomidate are thought to be linked to the solvent propylene glycol, a lipid formulation was developed. While this new formulation prevented injection pain, venous irritation and hemolysis, myoclonus incidence was not affected by the solvent.[1]

The formation of myoclonus during anesthesia induction with etomidate has clinical importance in select groups of patients. Myoclonus can increase the risk of regurgitation and aspiration in patients with full stomach, as it increases intraocular pressure it may cause vitreous prolapse in patients with open eye injuries, and as myocardial oxygen consumption increases during myoclonus it may cause problems in patients with limited cardiovascular reserves.[2] Finally myoclonus has been observed to be responsible for hypoxemia attacks during spontaneous respiration when etomidate is administered for sedation.[2,3] Despite the variety of medications that reduce the incidence and severity of myoclonic movements after etomidate administration, the mechanism is not clear. Doenicke et al. reported that myoclonus after treatment with etomidate was a phenomenon of subcortical disinhibition, like the phenomenon of restless legs during normal human sleep, and is not generated by an epileptic focus.[1,4]

Gabapentin, produced in 1993 as a treatment for chronic partial convulsions, is a new generation of anti-epileptic