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SCIENTIFIC ARTICLE

Comparison of granisetron and lidocaine on reducing injection pain of etomidate: a controlled randomized study

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KEYWORDS
Granisetron;
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Abstract
Background and objectives: Reducing pain on injection of anesthetic drugs is of importance to every anesthesiologist. In this study we pursued to define if pretreatment by granisetron reduces the pain on injection of etomidate similar to lidocaine.
Methods: Thirty patients aged between 18 and 50 years of American Society of Anesthesiologists physical status class I or II, whom were candidates for elective laparoscopic cholecystectomy surgery were enrolled in this study. Two 20 gauge cannulas were inserted into the veins on the dorsum of both hands and 100 mL of normal saline was administered during a 10 min period from each cannula. Using an elastic band as a tourniquet, venous drainage of both hands was occluded. 2 mL of granisetron was administered into one hand and 2 mL of lidocaine 2% at the same time into the other hand. One minute later the elastic band was opened and 2 mL of etomidate was administered to each hand with equal rates. The patients were asked to give a score from 0 to 10 (0 = no pain, 10 = severe pain) to each the pain sensed in each hand.
Results: Two patients were deeply sedated after injection of etomidate and unable to answer any questions. The mean numerical rating score for injection pain of intravenously administered etomidate after intravenous granisetron was 2.3 ± 1.7, which was lower when compared with pain sensed due to intravenously administered etomidate after administration of lidocaine 2% (4.6 ± 1.8), $p < 0.05$.
Conclusion: The result of this study demonstrated that, granisetron reduces pain on injection of etomidate more efficiently than lidocaine.

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PALAVRAS-CHAVE
Granisetron;
Lidocaína;
Etomidato;
Dor

Comparação de granisetron e lidocaína na redução da dor causada pela injeção de etomidato: estudo randômico e controlado

Resumo
Justificativa e objetivos: A redução da dor causada pela injeção de anestésicos é importante para todos os anestesiologistas. Neste estudo buscamos definir se o pré-tratamento com granisetron reduz a dor causada pela injeção de etomidato de forma semelhante à lidocaína.
Métodos: Trinta pacientes com idades entre 18 e 50 anos, estado físico ASA I ou II (de acordo com a classificação da Sociedade Americana de Anestesiologistas) e candidatos à colecistectomia laparoscópica eletiva foram incluídos neste estudo. Duas cânulas de calibre 20 foram inseridas nas veias do dorso de ambas as mãos e 100 mL de soro fisiológico foram administrados durante 10 minutos através de cada cânula. Usando um torniquete elástico, a drenagem venosa de ambas as mãos foi ocluída. Granisetron (2 mL) foi administrado em uma das mãos e lidocaína a 2% (2 mL) na outra mão ao mesmo tempo. Após um minuto, o torniquete foi afrouxado e 2 mL de etomidato foram administrados em velocidade igual a cada uma das mãos. Solicitamos dos pacientes uma classificação de 0 a 10 para a dor sentida em cada uma das mãos (0 = sem dor, 10 = dor intensa).
Resultados: Dois pacientes estavam profundamente sedados após a injeção de etomidato e, portanto, incapazes de responder a qualquer pergunta. O escore médio de classificação da dor à injeção de etomidato administrado por via endovenosa após granisetron intravenoso foi de $2,3 \pm 1,7$, o que foi menor em comparação com a dor sentida à administração intravenosa de etomidato após a administração de lidocaína a 2% ($4,6 \pm 1,8$), $p < 0,05$.
Conclusão: O resultado deste estudo demonstrou que granisetron reduz a dor causada pela injeção de etomidato com mais eficácia que lidocaína.

Introduction

Etomidate is an almost popular intravenous anesthetic agent, with almost unique hemodynamic profile following IV administration of it, as usually there is no hemodynamic change, so etomidate was considered for thermodynamically unstable patients. Etomidate is formulated in propyleneglycol therefore following intravenous injection, it may produce damages in vascular endothelium and so produces pain.[1] Considering the importance of using etomidate to produce a smooth induction of general anesthesia without any significant hemodynamic change, especially in cases with cardiovascular disorders or head trauma, prevention of pain on injection of etomidate seems to be logical.

To achieve this goal, many pretreatment by various drugs such as lidocaine, dexamethasone and magnesium sulphate were tested.[2,3] Lidocaine significantly reduces the incidence and severity of pain on injection of anesthetic drugs.[4]

Granisetron is a selective inhibitor of Type 3 serotonergic (5-HT3) receptors that has been used as an antiemetic and antinausiant for cancer chemotherapy patients. The broad distribution of five hydroxyl-tryptamine (5-HT3) receptors in human body has provided the basis for investigation of granisetron, as a selective serotonin 5-HT3 receptor antagonist in novel applications. Serotonergic receptor antagonists have been used to decrease pain on injection of some anesthetic agent with variable results.[5–7] Probably inhibition of Type 3 serotonergic receptors can reduce the pain on injection of intravenously administered drugs.

In present study, it was hypnotized that granisetron can reduce pain on injection of IV etomidate similar and even more than lidocaine.

The effect of pretreatment by IV granisetron on pain of induction of etomidate was considered as primary out come.

Methods

This trial was reviewed and approved by the Institutional Ethics Committee of Tehran University of Medical Sciences and was registered at Iranian registry of clinical trial (IRCT201411025175N19). An informed written consent was obtained from all the participants.

In this randomized, double-blinded, clinical trial, 30 American Society of Anesthesiologists (ASA) physical status class I patients aged between 25 and 60 years, who were candidates for elective laparoscopic cholecystectomy surgery requiring more than one intravenous access line were enrolled. Patients with a history of any neurological disease, chronic pain syndrome, thrombophlebitis or vascular disease, advanced systemic disorders such as diabetes *mellitus* and any contraindications of study protocol drugs, and addicted patient, were not enrolled in study. Exclusion criteria consisted of patients who dispensed with laparoscopic cholecystectomy surgery or patients who became deeply sedated before giving a score and patients whom veins were punctured more than once to gain. In the preoperative visit in the night before surgery all the patients were thoroughly explained the Numeric Rating Scale (NRS)

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