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SCIENTIFIC ARTICLE

Use of remifentanil to reduce propofol injection pain and the required propofol dose in upper digestive tract endoscopy diagnostic tests

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KEYWORDS
Sedation;
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Abstract
Background and objectives: The introduction of propofol (2,6-diisopropylphenol) as a sedative agent has transformed the area of sedation for endoscopic procedures. However, a major drawback of sedation with the use of propofol is its high incidence of injection pain. The most widely used technique in reducing propofol injection pain is through the association of other drugs. The aim of this study was to evaluate the effect of remifentanil-propofol combination on the incidence of propofol injection pain and its influence on the total dose of propofol required for sedation in upper digestive tract endoscopy (UDE) diagnostic tests.
Method: One hundred and five patients undergoing upper digestive tract endoscopy were evaluated and randomly divided into 3 groups of 35 patients each. The Control Group received propofol alone; Study-group 1 received remifentanil at a fixed dose of 0.2 mg/kg combined with propofol; Study-group 2 received remifentanil at a fixed dose of 0.3 mg/kg combined with propofol. The incidence of propofol injection pain and the total dose of propofol required for the test were evaluated. The sample was very similar regarding age, weight, height, sex, and physical status. Statistical analysis was performed according to the nature of the evaluated data. Student's *t*-test was used to compare the mean of age, weight, height (cm), and dose (mg/kg) variables between groups. The χ^2 test was used to compare sex, physical status, and propofol injection pain between groups. The significance level was $\alpha < 0.05$.
Results: There was significant statistical difference between the study groups and the control group regarding the parameters of propofol injection pain and total dose of propofol (mg/kg)

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used. However, there were no statistical differences between the two study groups for these parameters.
Conclusion: We conclude that the use of remifentanil at doses of 0.2 mg/kg and 0.3 mg/kg was effective for reducing both the propofol injection pain and the total dose of propofol used.

PALAVRAS-CHAVE
Sedação;
Endoscopia digestória alta diagnóstica;
Propofol;
Remifentanil

Uso do remifentanil para redução da dor à injeção de propofol e a dose necessária de propofol em exames de endoscopia digestória alta diagnóstica

Resumo
Justificativa e objetivos: A introdução do propofol (2,6-di-isopropilfenol) como agente sedativo tem transformado a área da sedação para procedimentos endoscópicos. Entretanto, um grande inconveniente da sedação com o uso do propofol é sua alta incidência de dor à injeção. A técnica mais usada na redução da dor à injeção do propofol tem sido a associação com outros fármacos. O objetivo deste estudo foi avaliar a repercussão da associação do remifentanil com o propofol na incidência de dor à injeção de propofol e a influência na dose total de propofol necessária para sedação em endoscopia digestória alta (EDA) diagnóstica.
Método: Foram avaliados 105 pacientes, submetidos à EDA diagnóstica e divididos aleatoriamente em três grupos de 35. O Grupo Controle foi sedado apenas com propofol. O Grupo de Estudo 1 foi sedado com remifentanil em dose fixa de 0,2 μg/kg associado ao propofol. E o Grupo de Estudo 2 foi sedado com remifentanil em dose fixa de 0,3 μg/kg associado ao propofol. Foram avaliadas a incidência de dor à injeção de propofol e a dose de propofol necessária para o exame. A amostra se mostrou bastante similar em relação às variáveis idade, peso, altura, sexo e estado físico. De acordo com a natureza dos dados estudados, procedeu-se ao tratamento estatístico julgado adequado. Usou-se o teste *t* para comparação, entre os grupos analisados, das médias das variáveis idade, peso, altura (cm) e dose (mg/kg). Foi usado o teste χ^2 para comparação, entre os grupos analisados, das variáveis sexo, estado físico e dor à injeção de propofol. O nível de significância adotado foi $\alpha < 0,05$.
Resultado: Houve diferença estatística significativa entre os grupos de estudo e o grupo controle tanto no parâmetro dor à injeção de propofol quanto no parâmetro dose de propofol usada (mg/kg). Entretanto, não houve diferenças estatísticas entre os dois grupos de estudo para esses parâmetros.
Conclusão: O uso do remifentanil nas doses de 0,2 μg/kg e de 0,3 μg/kg mostrou-se efetivo tanto sobre o parâmetro redução da dor à injeção de propofol quanto sobre o parâmetro dose de propofol usada.

Introduction

In many countries, sedation has become routine in patients undergoing colonoscopy and diagnostic upper digestive tract endoscopy (UDE).[1] According to a survey from the American College of Gastroenterologists, sedation is used in over 98% of colonoscopy exams and UE in the United States.[2] The term sedation is used for depression of an individual's level of consciousness. Sedation is used to promote anxiolysis, amnesia, and, in some instances, analgesia.[3]

The introduction of propofol (2,6-diisopropylphenol) as a sedative agent has transformed the area of sedation for endoscopic procedures.[3] Much of propofol's popularity between physicians and patients is related to its pharmacokinetic and pharmacodynamic properties, which gives the drug a quick start and end of its effects and provides the patient a sense of well-being.[3] In many respects, propofol is an ideal agent for short procedures in outpatients. However, because of its pharmacological profile, one of its recommendations is to be used only by professionals trained in the administration of general anesthesia.[4] A major drawback of sedation using propofol is its high incidence of injection pain.[5,6] The presence of propofol injection pain ranges from 28%[7] to 90%[8] of cases.

Macario et al.[9] questioned among American anesthesiologists which anesthetic clinical outcomes are common and necessary to avoid. Propofol injection pain during anesthetic induction was ranked as the seventh most important