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Review article

The analgesic effect of intravenous lidocaine in the treatment of chronic pain: a literature review

*Maiara Ferreira de Souza**, *Durval Campos Kraychete*

Medicine School, Universidade Federal da Bahia, Salvador, BA, Brazil

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ABSTRACT

Background: Pain is a public health problem, greatly impairing quality of life. Almost 80% of patients with chronic pain reported that their pain interferes with activities of daily living, and two thirds reported that the pain causes negative impact on their personal relationships. The physical and functional disability, whether temporary or permanent, compromises the professional activity and causes work absenteeism, increasing costs of health systems.
Objectives: The aim of this review is to analyze, based on the literature, the analgesic effect of lidocaine administered intravenously for the treatment of chronic pain and to evaluate the reduction of pain intensity in patients with chronic pain, focusing on musculoskeletal and neuropathic etiology.
Methodology: The method used was a review of the literature, consisting in searching the scientific literature on the efficacy of intravenous lidocaine infusion in the treatment of patients with chronic pain.
Content: Of the 19 studies reviewed, 12 had results that confirm the analgesic effect of intravenous lidocaine in patients with chronic pain. Most authors used doses of 5 mg/kg infused for 30 minutes or more, producing significant analgesia with variable duration (minutes to weeks).
Conclusions: Based on the literature review, it is not possible to uniformly specify the most effective and safe dose of lidocaine administered intravenously for the treatment of neuropathic or musculoskeletal pain. As for effectiveness, the intravenous infusion of lidocaine as an alternative for the treatment of chronic pain of various etiologies seems very promising, but further studies need to be conducted.

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* *Corresponding author.*
E-mail: maifsmr@hotmail.com (M.F. de Souza).
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A ação analgésica da lidocaína intravenosa no tratamento da dor crônica: uma revisão de literatura

Palavras-chave:
Lidocaína
Lidocaína intravenosa
Dor crônica

RESUMO

Justificativa: A dor é um problema de saúde pública, comprometendo sobremaneira a qualidade de vida. Quase 80% dos pacientes com dor crônica relataram que a dor interfere em suas atividades da vida diária, e dois terços afirmaram que a dor provoca impacto negativo nas relações pessoais. A incapacidade física e funcional, seja temporária ou permanente, compromete a atividade profissional e causa absenteísmo ao trabalho, elevando os custos dos sistemas de saúde.

Objetivos: O objetivo desta revisão é analisar, com base na literatura, o efeito analgésico da lidocaína administrada por via intravenosa no tratamento da dor crônica e avaliar a redução da intensidade da dor em pacientes com dor crônica, focando a etiologia musculoesquelética e neuropática.

Metodologia: O método adotado foi o de revisão da literatura, consistindo na busca de artigos científicos sobre a eficácia da infusão intravenosa de lidocaína no tratamento de pacientes com dor crônica.

Conteúdo: Dos 19 estudos revisados, 12 apresentaram resultados que confirmam a ação analgésica da lidocaína por via intravenosa em pacientes com dor crônica. A maioria dos autores utilizou doses de 5 mg/kg infundidas por 30 minutos ou mais, produzindo analgesia significativa com duração variável (de minutos a semanas).

Conclusões: Com base na revisão da literatura, não é possível uniformemente especificar a dose mais eficaz e segura de lidocaína administrada por via intravenosa no tratamento da dor neuropática ou musculoesquelética. Quanto à eficácia, a infusão intravenosa da lidocaína como alternativa para o tratamento da dor crônica de etiologias diversas parece bastante promissora, embora estudos adicionais necessitem ser realizados.

Introduction

Chronic pain affects approximately 7% to 40% of the world population.[1] In Brazil, a study conducted by WHO, in 1998, showed a prevalence of 31% (data from Rio de Janeiro);[2] on the other hand, in Salvador, Bahia, it is estimated that 41.4% of the population suffers from chronic pain.[1]

Pain is a public health problem,[3–5] greatly impairing the quality of life. Several factors, such as depression, sleep disturbances, difficulty concentrating, hopelessness, feelings of death and others, are associated with this symptom. The loss of quality of life is a fact, as the pain begins to guide and limit the behavior and activities of the subject, generating social withdrawal, changes in sexuality, changes in family dynamics and economic imbalance.[3] Nearly 80% of patients with chronic pain reported that their pain interferes in activities of daily living, and two thirds said that the pain causes negative impact on personal relationships.[6] Physical and functional disability, whether temporary or permanent, jeopardizes the professional activity[7] and causes work absenteeism, increasing the costs of health systems.[5] In the United States, for example, it is estimated that over 50 million working days are lost each year.[8] Thus, chronic pain is an important medical and social problem, and opioid abuse is of great concern, due for the problems stemming from their multiple side effects, including addiction.

Often the complexity of the pathophysiological mechanisms that explain the initiation and maintenance of pain makes difficult the assessment, diagnosis and treatment of pain syndromes that may present inflammatory, neuropathic or mixed components. Thus, there are several classes of drugs used in the treatment of chronic pain patients, in an attempt to reduce the intensity of pain and improve their quality of life. Among the local anesthetics, lidocaine [2-(diethylamino)-N-(2,6 dimethylphenyl) acetamide], a weak base with antiarrhythmic properties,[9] has been used by various routes, including intravenous.

Lidocaine alters the transmembrane conductance of cations, especially sodium, potassium and calcium, both in neurons and myocytes.[10] Voltage-dependent sodium channels constitute its classical targets, and the affinity of the drug for the channel is greater when it is opened (activated or inactive).[9] Thus, the degree of blocking varies according to the neuronal stimulation frequency.[6,11] However, other mechanisms are also involved in the analgesia provided by lidocaine[9,12] as, for instance, the interaction, whether direct or indirect, with different receptors and pathways of nociceptive transmission, like the muscarinic agonists, glicine inhibitors, release of endogenous opioids and of adenosine triphosphate, and the reduced production of excitatory amino acids, neurokinins and thromboxane A2.[12]

Although lidocaine is typically administered through local injections, it is also used intravenously for various purposes, such as regional anesthesia, as an anti-dysrhythmic agent, in the relief of peripheral and central neuropathic pain,[13,14] fibromyalgia treatment[15] and as an adjuvant in postoperative pain,[9] among others.