

Intravenous Lidocaine Infusion for Treatment of Acute Ischemic Lower Extremity Pain

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Introduction

Lidocaine is an amide local anesthetic that also possesses anti-arrhythmic, anti-nociceptive and anti-inflammatory properties, blocking NMDA and muscarinic (M1 & M3) targets at therapeutic levels (1.5-5 µg/mL) [1]. Intravenous lidocaine administration must be carefully monitored as it possesses a narrow therapeutic index, posing a risk for local anesthetic systemic toxicity. We present a case of intravenous lidocaine infusion for the treatment of acute ischemic toe pain in a heart-kidney transplant candidate with ischemic cardiomyopathy.



Clinical photo taken after lidocaine infusion showing erythematous and dusky lower extremities.

Case Description

A 68 year-old, 78 kilogram male with severe ischemic cardiomyopathy, hypertension, type II diabetes, chronic kidney disease on hemodialysis, and atrial fibrillation, presented with cardiogenic-septic shock requiring multiple vasopressors including norepinephrine, vasopressin, dobutamine, milrinone, and epinephrine, and mechanical support with an intra-aortic balloon pump.

He was pending combined heart-kidney transplant and had ischemic toe pain affecting all toes, which appeared erythematous and dusky. He endorsed significant pain with ambulation and exquisite sharp, burning pain on palpation. The etiology of his pain was thought to be due to prolonged vasopressors use and possible microembolic phenomena. Arterial duplex ultrasound showed no significant occlusion.

A lidocaine infusion was initiated at 1mg/minute (0.77mg/kg/hour) without loading dose. Bi-daily systemic lidocaine levels were obtained, with mean level 3.93µg/mL. He was started on oral pregabalin to address a possible neuropathic component. The next morning, he had marked subjective improvement in his pain and ambulated. During the three day prior to initiating the infusion, he required multiple doses of oxycodone, but he required no opioids during the 24 hour period that the lidocaine was initiated. He underwent uncomplicated heart-kidney transplant. The lidocaine infusion was held intraoperatively, resumed post-operatively, titrated to maintain therapeutic levels, and was discontinued on POD6.

Discussion

Intravenous lidocaine infusion is widely used in the operating room, where it is incorporated into several ERAS protocols [2-4]. A growing body of evidence supports its use in the perioperative space for acute pain [5]. This case demonstrates rapid improvement of ischemic pain in a patient with multiorgan dysfunction, facilitating return to ambulation without evidence of toxicity. Careful titration, communication with patient, nursing, surgeons, and frequent monitoring of lidocaine levels are critical for patient safety.

References

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