

Letters to the Editor

LIDOCAINE UNLIKELY TO CAUSE METHEMOGLOBINEMIA

To the Editor:

We read with interest the recent *Letters to the Editor* exchange between Drs. Chittivelu and Hussain titled "Lidocaine-Induced Myocardial Injury" (*Hospital Physician* 2000;36[2]:17), wherein they speculate that methemoglobin-related impairment of oxygen delivery may contribute to myocardial complications following bronchoscopy. We congratulate the authors for considering this possibility as a component of the differential diagnosis, yet we are concerned that their statements may unintentionally direct readers toward an extremely rare drug complication at the expense of neglecting a more common association.

Methemoglobin production is primarily associated with two local anesthetics—prilocaine and benzocaine. Prilocaine is the prototypical drug for inducing dose-related production of methemoglobin but is only available in the United States as a component of EMLA cream (Astra Pharmaceuticals, Wayne, PA), a eutectic mixture of 2.5% prilocaine and 2.5% lidocaine. Benzocaine is also recognized to cause methemoglobin production, particularly after mucous membrane application. Indeed, we respectfully query if benzocaine was used in the case patient. Just a 1- or 2-second spritz with either 14% or 20% benzocaine spray delivers the maximum recommended dose. Conversely, lidocaine is rarely reported to induce methemoglobinemia; if lidocaine induces methemoglobinemia, it almost always occurs in the setting of other agents and comorbidities. Thus, we feel it is important to emphasize the point that benzocaine is much more likely than lidocaine to cause methemoglobinemia.

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In reply:

I thank Drs. Neal and Pollock and Ms. Folsom for their excellent letter. They correctly suggest that benzocaine is a more likely cause of methemoglobinemia

than lidocaine. They also appropriately suggest that methemoglobinemia induced by lidocaine is most likely to occur in the setting of preexisting comorbidities. The occurrence of benzocaine-induced methemoglobinemia is also low—one in 7000 bronchoscopies.¹ Factors that predispose to methemoglobin development include a complete or partial deficiency of erythrocyte methemoglobin reductase enzyme in a patient, the use of excessive benzocaine or lidocaine, a breakdown in tissue barrier caused by preexisting mucositis or multiple biopsies, the brushing of bronchial mucosa obtained for diagnostic purposes, and simultaneous use of other drugs that have the potential to generate methemoglobin. Despite the low incidence of methemoglobinemia, all endoscopists must be aware that most of the local anesthetics have the potential to induce this disorder.

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In reply:

I thank Drs. Neal and Pollock and Ms. Folsom for their excellent comments suggesting that benzocaine, which was not used in our patient, is also a recognized contributing factor that produces methemoglobin. Methemoglobinemia is a rare complication of local anesthetics; commonly used doses of anesthetics may cause small elevations of methemoglobin that probably are not of clinical significance. However, physicians need to be aware that lidocaine-induced methemoglobinemia, as well as benzocaine-induced methemoglobinemia, although uncommon, can impair the oxygen carrying capacity of blood and potentially exacerbate ischemia, which might lead to life-threatening complications such as myocardial necrosis.

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REFERENCE

1. Dinneen SF, Mohr DN, Fairbanks VF: Methemoglobinemia from topically applied anesthetic spray. *Mayo Clin Proc* 1994;69:886-888.