

## Levamisole tainted cocaine induced vasculitis

Kelly Dewey, Michael Simmons, Fernanda Duarte, Salim Surani

### Abstract

**Levamisole has been implicated in the vasculitis and agranulocytosis. It has been pulled from the United States market for human use. Due to its euphoric and bulking properties, it has been**

**used as a bulking agent in cocaine. We hereby present a case of a 56-year-old Hispanic male, who developed vasculitis due to cocaine use adulterated with levamisole.**

**Key words:** Vasculitis, cocaine, levamisole.

### Introduction

Levamisole is an increasingly common adulterant in the United States' (US) cocaine supply. The US Drug Enforcement Agency (DEA) reported in 2011 that 82% of seized cocaine contained this bulking agent originally marketed as an anthelmintic. (1) Levamisole has been implicated in vasculitis and severe agranulocytosis. As a result, it was pulled from the US market for human consumption in 2000. (1) Currently, levamisole is marketed for veterinary use. Levamisole-induced vasculitis follows common clinical pathways including the ear 73% of cases and lower extremities 84% of cases. The patients may present with arthralgias in 31% of cases. Laboratory findings have p-ANCA positive 88% of cases and c-ANCA positive 21% of cases. (2)

### Case presentation

A 56-year-old Hispanic male presented to the emergency department with sepsis was admitted to the intensive care unit with bilateral knee pain and "blue ears". The patient was found to have a left shift on his blood cell count ("bandemia"), as well

as pancytopenia. Clinically, he had fever, tachycardia, and mild hypotension that were responsive to fluids. Blood cultures and lumbar puncture were performed. On presentation, he had cyanosis of the both ears that worsened to thrombosis and spread to the patient's cheeks and nasal bridge by the time patient was transferred to an intensive care unit bed (**Figure 1-3**). On arrival he had adamantly denied any drug use. The patient's family, however, volunteered after a couple of days, that the patient was a long-time cocaine user, and would regularly cut his own cocaine with a white powder that turned out to be levamisole. The patient during the course of his hospitalization developed necrosis of his uvula and skin necrosis on his arms. A skin biopsy obtained showed histologic findings consistent with a drug-induced vasculitis. Blood test for MPO antibody was positive consistent with ANCA positive vasculitis. The patient was treated with steroids and empiric antibiotics. He was discharged home after initial improvement with outpatient follow-up. The extent of the vasculitis with subsequent necrosis was documented at this return visit (**Figures 4 & 5**). These photos were taken 21 days after initial presentation.

### Discussion

Levamisole is an increasingly common additive to cocaine. In humans, besides its use as a bulking agent, it is theorized that there is an additive euphoric effect when mixed with cocaine. Levamisole, like other anthelmintics, binds at ganglionic nicotinic acetylcholine receptors causing increased acetylcholine and muscular contraction. This mechanism in helminths is what allows the worm to be expelled. In mammals, it is thought that besides the ganglionic nicotinic acetylcholine receptors, levamisole also binds with the autonomic ner-

---

From Christus Spohn Hospital, Corpus Christi, Texas, USA (Kelly Dewey and Michael Simmons), Universidad del Valle de México, Hermosillo, Sonora, México (Fernanda Duarte), and Texas A&M University, Texas, USA (Salim Surani).

### Address for correspondence:

Salim Surani, MD  
1177 West Wheeler Ave, Suite 1  
Aransas Pass, Texas 78336, USA  
Tel: +1-361-885-7722  
Fax: +1-361-850-7563  
Email: srsurani@hotmail.com

vous system nicotinic acetylcholine receptors. In the central nervous system binding at these receptors increases the release of norepinephrine, increasing sympathetic activity, and glutamate, increasing dopamine release. Cocaine blocks the reuptake of norepinephrine, increasing sympathetic activity, and blocks the reuptake of dopamine, increasing the meso-limbic system guided “high”. (3,4)

Treatment of levamisole-induced vasculitis remains controversial. Many patients are started on systemic steroids while others are offered conservative management with wound care. In a retrospective review of 43 cases of levamisole-induced vasculitis, 58% were treated with steroids and 35%

were treated with conservative management. Of those study patients who showed improvement, 59% were given systemic steroids and 36% were treated conservatively. This shows a trend toward systemic steroids being beneficial. (3)

With the increasing incidence of the adulteration of cocaine and the theorized additive euphoric side effect, the presentation of levamisole induced vasculitis and neutropenia is likely to become a more frequent presentation in the emergency department.

#### **Conflict of interest**

None of the authors have any conflict of interest to disclose.

**Figure 1.** Left ear with evidence of cyanosis



**Figure 2.** Cyanosis of right ear



**Figure 3.** Cyanosis and clinical vasculitis of nasal bridge and cheek



**Figure 4.** Necrosis of right ear



**Figure 5.** Necrosis of left ear



## References

1. Chang A, Osterloh J, Thomas J. Levamisole: a dangerous new cocaine adulterant. *Clin Pharmacol Ther* 2010;88:408-11.
2. Pearson T, Bremmer M, Cohen J, Driscoll M. Vasculopathy related to cocaine adulterated with levamisole: A review of the literature. *Dermatol online J* 2012;18:1.
3. Raymon LP, Isenschmid DS. Letter to the editor: The possible role of levamisole in illicit cocaine preparations. *J Anal Toxicol* 2009;33:620-2.
4. Larocque A, Hoffman RS. Levamisole in cocaine: Unexpected news from an old acquaintance. *Clin Toxicol (Phila)* 2012;50:231-41.