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'Krokodil'—A Designer Drug from Across the Atlantic, with Serious Consequences

To the Editor:

Use of "Krokodil," a deadly Russian designer drug, has been spreading rapidly across Europe.[1,2] It can turn an addict's skin dark, scaly, and necrotic and cause it to wither away. "Krokodil" use was first reported in Siberia in 2002 and so far has been reported only in European countries.[3] Our case aims to shed light on the alarming fact that this deadly mixture has made its way into the United States. We report a case of a young man who has been admitted multiple times in a 5-month period, with rapidly progressing necrotic leg ulcers, after intravenous abuse of homemade heroin.

CASE REPORT

Our patient is a 30-year-old man who presented to the hospital with pain, swelling, and ulceration of his left thigh. The patient mentioned that he had been injecting a homemade drug called "Krokodil" into his affected area for the past 6-7 months. He initially noticed blisters at the skin popping sites, which rapidly turned black along with painful swelling of the legs. Within 1 month, the black necrotic area peeled off, leaving a painful necrotic ulcer (**Figure**). Two months before this admission, he noticed rapidly progressing swelling of his left little finger with blisters, which later turned black and auto-amputated. The patient had been injecting heroin into his arms and thighs for the past 7-8 years. The patient was a daily heroin user, which cost him approximately $300 per day, forcing him to obtain cheaper homemade heroin substitutes prepared from codeine. While in the hospital, he was treated with intravenous antibiotics and intensive wound care along with precautions for opiates and benzodiazepine withdrawals. As soon as he felt some relief from his pain, he left the hospital against medical advice. The patient was lost to follow-up despite multiple attempts.

DISCUSSION

"Krokodil" is a mixture of several chemicals; the root agent is desomorphine, a synthetic derivative of morphine. It can be manufactured at home from codeine, along with easily available additives, and is significantly cheaper than heroin. Desomorphine has 8 to 10 times higher analgesic potency, faster onset of action, and shorter half-life compared with morphine, which accounts for its increased addictive potential.[4,5] The simple and cheap domestic production process involves boiling codeine with a diluting agent (mostly paint thinner), gasoline, hydrochloric acid, iodine, and red phosphorous (which are scraped from the striking surfaces on matchboxes), resulting in the production of desomorphine and various toxic byproducts.[3] Because of the high degree of contamination with different toxic chemicals, which vary among users, scientific analysis of the chemical composition is not available. Its regular use results in severe damage to the vasculature, muscles, and bones, and in multiorgan failure with a mean survival time of 2 years since its first use.[3,6] Use of this novel flesh-eating drug has been spreading rapidly across Europe[1,2] because of its low cost and higher addictive potential. With a significant number of prescription opiate drug abusers in the United States, "Krokodil" could find a fertile breeding ground here.

CONCLUSIONS

Our case highlights the need for physicians to be cognizant of this deadly flesh-eating drug. Because of "Krokodil's" ease of manufacture, low cost, and potency, there is a good chance that it could become popular in the US.

Figure Patient's lower extremity showing injection site ulcers with necrotic scar tissue.

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