

Krokodil: A New Drug of Abuse

A new homemade illicit drug is making its way from other countries to the United States and is bringing with it significant morbidity and mortality. The drug has been called the “most dangerous drug yet” and is known in the media for turning users into “zombie-like creatures.” Krokodil, pronounced “crocodile,” is an extremely addictive injectable opioid that causes an unprecedented euphoria at a detrimental expense.

Krokodil is made up of the synthetic morphine analog, desomorphine which produces an opiate-like effect with a fast onset and brief duration. The drug is known to have a 10 times more potent analgesic effect than morphine with increased toxicity, respiratory effects, and depression. The drug is made by altering codeine formulations and thought to include a concoction of iodine, phosphorus, gasoline, paint thinner, and several other heavy metal compounds. The mixture requires 80-400 mg of codeine that can be extracted from prescription tablets or liquid, prescription combinations with acetaminophen, or over-the-counter cough syrups and only takes 15-30 minutes to make. This allows manufacturers to sell the product for very cheap, making the drug a less expensive alternative to heroin or other illicit medications. In Russia, where even codeine tablets are available over-the-counter, this product has really caught on. It is estimated that up to 1 million Russian citizens are using krokodil and the problem is reaching epidemic proportions. The drug has also been seen in Ukraine, Germany, and Norway with very limited cases in the United States.

In recent years, drug treatment services in Russia and Ukraine have reported severe health consequences and unparalleled harms associated with krokodil injection. The most common complications of krokodil appear to be serious venous damage and skin and soft tissue infections that are followed by necrosis and gangrene. The drastic complications that are caused by the toxic byproducts, rather than desomorphine itself, are what gives the drug its name. Characteristic skin discoloration and desquamation from gangrenous inflammation at the injection site have been said to resemble the scales of a crocodile. The skin deterioration is said to be so severe that flesh can fall from bone giving a “zombie-like” appearance according to media reports. Other reported harms include blood poisoning, meningitis, bone infections, speech and motor skills impairments, thrombosis of major blood vessels, sores on the forehead and skull, and liver and kidney damage. Despite these harmful effects, abusers continue to use the drug because of its intense euphoric effects. Poor access to proper health care for IV drug users may exacerbate the described harms considerably. Medical help is reportedly only sought after by people who inject krokodil in Russia at a very late stage of the disease which may end in severe mutilation, amputation of limbs, or even death.

Krokodil has the potential to become popular in the injectable drug user population in America. The easy manufacturing process, availability of ingredients, and extreme physiological effects appeal to abusers despite negative consequences. The DEA is concerned drug users will turn to krokodil as a cheaper option than other street drugs. It may be important to closely monitor the prescribing and use of codeine to help prevent this occurrence in the United States.

References

1. Grund J, Latypov A, Harris M. Breaking worse: The emergence of krokodil and excessive injuries among people who inject drugs in Eurasia. *Int J Drug Policy*. 2013 Jul;24(4):265-74.
2. Heimer R. Patterns of new drug emergence: a comment in light of 'krokodil'. *Int J Drug Policy*. 2013 Jul;24(4):275-7.
3. Azbel L, Dvoryak S, Altice FL. 'Krokodil' and what a long strange trip it's been. *Int J Drug Policy*. 2013 Jul;24(4):279-80.
4. Gahr M, Freudenmann RW, Hiemke C, Gunst IM, Connemann BJ, Schönfeldt-Lecuona C. Desomorphine goes "crocodile". *J Addict Dis*. 2012;31(4):407-12.
5. Booth RE. 'Krokodil' and other home-produced drugs for injection: a perspective from Ukraine. *Int J Drug Policy*. 2013 Jul;24(4):277-8.
6. Desomorphine. Drug Enforcement Administration Office of Diversion Control. Oct 2013. Available at: http://www.deadiversion.usdoj.gov/drug_chem_info/desomorphine.pdf

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