

**Krokodile Injectors from Donetsk, Nikolayev
and Odessa, Ukraine**

**Robert E. Booth, Ph.D., Sergey Dvoryak, MD,
J. Thomas Brewster, LCSW, Christine Garver-
Apgar, Ph.D.**

**Division of Substance Dependence, University of
Colorado School of Medicine, Denver, CO**

**Supported by the National Institute on Drug Abuse
RO1 DA026739**





Study's Purpose

- ❖ To assess drug- and sex-related risk behaviors, as well as HIV status, among krokodile injectors compared to injectors of opiates only and opiates/stimulants
- ❖ Sample (N = 506) included:
 - ❖ 217 opiate injectors (43%)
 - ❖ 84 opiate/krokodil injectors (17%)
 - ❖ 159 opiate/stimulant injectors (31%)
 - ❖ 46 opiate/stimulant/krokodil injectors (9%)





Focus Group Findings

- ❖ In July 2013 focus groups were conducted in Donetsk (N = 7) and Odessa (N=8)

PWID averaged 35 years of age in Donetsk and 48 in Odessa

In Donetsk everyone injected daily, 5 – 12 times each day

In Odessa participants injected 1 – 2 times a week

Why is it called “krokodile”?

“Because it destroys tissue.”

“Because electric ovens are used to cook it.”

“Because it is like an electric train; it takes you to another world.”

“Because it gives you a flash when it hits the body.”

How long does it take to come on and how long does it last?

Immediately & 4 – 5 hours the first time

Krokodile (Desomorphine) Ingredients

- ❖ Takes 45 – 60 minutes to prepare using common household equipment
- ❖ Ingredients (measured “approximately”)
 - ❖ Codeine pills
 - ❖ Red phosphorus
 - ❖ Iodine
 - ❖ Also:
 - ❖ Hydrochloric acid
 - ❖ Vinegar
 - ❖ Paint thinner, lighter fluid, turpentine or gasoline
 - ❖ Baking powder
 - ❖ Alcohol

❖ What are the dangers?

- ❖ Destruction of limbs and tissues
- ❖ One had her jaw destroyed
- ❖ Thrombosis
- ❖ Liver damage
- ❖ “When a body is cut up it looks like jelly inside.”
- ❖ “Krokodile has eaten off the top part of my leg.”
- ❖ “Everything gets rotten. It rots away. You can’t stop it.”
- ❖ “If it gets directly into your veins its okay. Its dangerous when it gets under the skin.”

❖ Other comments —

- ❖ “Most of the people who died did not reach the age of 30”
- ❖ “We may not be here in 2 years when you publish because we use krokodile and may die.”
- ❖ “This is the most dangerous drug in Ukraine; you can use opiates for 20 years but this drug for only one year.”

❖ Why use it?

- ❖ When they don't have the money for opiates; its very cheap
- ❖ When they don't have access to opiates
- ❖ When they don't have another option and need to stop withdrawal
 - ❖ “No one uses it for euphoria, for fun”
 - ❖ “The difference between opiates and krokodile is like the difference between 100 year old cognac and homemade vodka”

❖ Why not seek medical treatment?

- ❖ “Cannot endure the interim period when drugs are not taken”
- ❖ Most drug users want to conceal their status
- ❖ Without money no one will help you

Methods

- Between December 2012 and August 2013, 506 people who inject drugs (PWID) were recruited from Donetsk, Nikolayev and Odessa.
- Participants were recruited through street outreach by former drug users familiar with the drug-using scene in their respective city.

Eligibility criteria included:

- 18 years of age or older
- Self-reported drug injection in the previous 30 days
- Not too dysfunctional or incapable of providing informed consent

Assessments

- ❖ Risk Behavior Assessment Questionnaire (NIDA, 1991) was modified, translated into Russian, and “computerized”
 - Self-reported information about drug use, risky behaviors, drugs injected, sex behaviors, health status (including HIV)
- ❖ Rapid HIV Test (HIV I + II One-Step Test) was given

Demographics

Female	23.0%
Average age	31.6 (SD = 7.1)
Married or living as married	25.3%
Education	
Unfinished secondary education	6%
Completed secondary education	36%
Some post-secondary education	55%
Homeless	6.3%
Ever arrested	45.7%

Drugs Typically Injected

- ❖ Pseudo-ephedrine that also contains iodine, red phosphorus and vinegar. Known as “vint”, “jeff” or “boltushka” in Donetsk and Nikolayev and “shirka” or “boltushka” in Odessa
- ❖ Poppy straw that also contains baking soda, solvent, vinegar and formaldehyde and, in some cases, blood or egg whites. Known as “shirka” in Donetsk and Nikolayev and “hemia” in Odessa
- ❖ Opiate/Sedative Mixture – opiates combined with Dimidrol
- ❖ Krokodile

Drug Injector Type

Overall and by City

Drug Injector Type	Totals	Donetsk	Nikolayev	Odessa
Opiates-only	217 (42.9%)	43.3%	76.3%	9.0%
Opiates + Krokodil	84 (16.6%)	27.8%	14.7%	4.5%
Opiates/Stimulants	159 (31.4%)	10.8%	7.1%	81.4%
Op/Stim + Krokodil	46 (9.1%)	18.0%	1.9%	5.1%
Total	506 (100%)	100%	100%	100%

Drug injector type differed significantly by city: $X^2 = 319.6$; $p < .001$

Drug-Related Risk Factors by Drug Injector Type

Drug Risk past 30 days	Opiates Only	Opiate + Krok	<i>p</i>	Op/Stim Only	Op/Stim + Krok.	<i>p</i>
Years injecting	13.8	12.1	+	8.8	14.0	***
Times Injected	26.6	62.7	***	34.2	72.8	***
Used a used syringe	12%	35%	***	5%	54%	***
Always injected w/ others	48%	49%	(<i>ns</i>)	43%	52%	(<i>ns</i>)
Front/back loaded with dealer	82%	81%	(<i>ns</i>)	91%	72%	**
Front/back loaded with others	62%	93%	***	93%	96%	(<i>ns</i>)
Shared “works” with others	9%	27%	***	77%	41%	***
Split solution with others	66%	94%	***	93%	96%	(<i>ns</i>)

+ $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$

Sex-Related Risk Factors by Drug Injector Type

Sex Risk past 30 days	Opiates Only	Opiates + Krok	<i>p</i>	Op/Stim Only	Op/Stim Mix + Krok.	<i>p</i>
Had sex	57%	64%	(<i>ns</i>)	79%	80%	(<i>ns</i>)
Had sex without a condom	36%	44%	(<i>ns</i>)	40%	54%	+
Had more than one sex partner	7%	8%	(<i>ns</i>)	20%	17%	(<i>ns</i>)
Had an PWID sex partner	30%	42%	+	67%	57%	(<i>ns</i>)
Had an HIV+ sex Partner or DK	10%	8%	(<i>ns</i>)	31%	35%	(<i>ns</i>)

+ $p < .1$

Composite Drug & Sex Risks by Drug User Type

Drug Risks
(Range = 0-5)

Sex Risks
(Range = 0-5)

	Mean (SD)	<i>p</i>	Mean (SD)	<i>p</i>
Drug User Type				
Opiates-Only	2.7 (1.1)	***	1.4 (1.4)	(<i>ns</i>)
Opiates + Krokodil	3.5 (.74)		1.7 (1.4)	
Opiates/Stimulants Only	3.2 (.74)	***	2.3 (1.4)	(<i>ns</i>)
Op/Stim + Krokodil	3.7 (.70)		2.4 (1.6)	

*** $p < .001$

HIV Status by Drug Injector Type

(Overall and for each city)

	Total (N = 506)	Donetsk (N = 194)	Nikolayev (N = 156)	Odessa (N = 156)
Drug Injector Type	Percent HIV+ (N)	Percent HIV+ (N)	Percent HIV+ (N)	Percent HIV+ (N)
Opiates-only	43% (217)	41% (84)	46% (119)	36% (14)
Opiates + Krokodil	48% (84)	46% (54)	52% (23)	43% (7)
Opiates/Stimulants Only	30% (159)	24% (21)	18% (11)	32% (127)
Op/Stim + Krokodil	39% (46)	34% (35)	0% (3)	75% (8)
Total	39%	39%	44%	35%

Summary

- ❖ The PWID in this study averaged nearly 30 years of age and they had been injecting for slightly more than 10 years, or since they were 20 years of age
- ❖ They reported extremely high rates of drug and sex-related risk behaviors
 - 80% front/backloaded with another PWID, 84% with a dealer and 82% split the drug solution
 - 40% had sex without a condom, 46% reported a PWID sex partner and 19% had an HIV infected partner or they did not know the HIV status of their partner
- ❖ Nearly 40% were HIV infected, including 39% in Donetsk, 44% in Nikolayev and 35% in Odessa

Summary

- ❖ Overall, krokodile injectors injected more than twice as often as those who did not inject krokodile and they were far more likely to have used a used needle/syringe
- ❖ On the composite injection risk scale, opiate/krokodile injectors were at significantly greater risk than opiate-only injectors, as were opiate/stimulant/krokodile injectors compared to opiate/stimulant injectors
- ❖ No significant differences were observed on sex risks according to drug user type
- ❖ No significant differences were found according to HIV status and drug user type, although opiate/krokodile injectors were more likely to be infected than opiate-only injectors (48% vs. 43%), as were opiate/stimulant/krokodile injectors compared to opiate/stimulant injectors (39% vs. 30%)

Limitations

- ❖ Other than HIV status, these findings were based on self-report, which may have been affected by social desirability as well as recall
- ❖ The relatively small sample size of krokodile injectors (N = 130) may limit the generalizability of reported findings

Conclusions

- ❖ In all likelihood, the rate of HIV infection among krokodile injectors will rise rapidly in the future, in light of their high rate of injection-related risk behaviors.
- ❖ Given the extreme physical adverse affects of injecting krokodile, preventing HIV infection may not be the most pressing need for PWID in Ukraine



Ukraine Research Team