VX or BS: What Really Killed Kim Jong-Nam?

By Josh Bloom — February 25, 2017

Last week I speculated [1] on the cause of the poisoning death Kin-Jong-Nam, using this table of common poisons:
Sarin (red circle), which is functionally identical to the real culprit VX gas \[2\], (except much less potent) seemed like a reasonable candidate because:

1. It penetrates skin
2. It is deadly when inhaled
3. It works really quickly
4. It requires little toxicological creativity to think of it

But, news reports of Kim's symptoms before he died were not consistent with what VX/Sarin would have done to him, so (with the exception of kale) nothing made sense (1). Until now. Maybe.

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**Sarin and VX: Two similar beasts. The “business end” (the portion of the molecule responsible for the toxicity) is highlighted in pink.**

Let's look at the reports in the news and examine why people had trouble trying to figure out what
happened. Following are quotes from media outlets over the past 10 days. And this may not be settled yet because it still doesn't add up.

**CNN** [3], 2/13: "He felt like someone grabbed or held his face from behind..."

**New York Times** [4], 2/14 "Moments later, he felt dizzy and was carried out on a stretcher, apparently dying from poisoned-needle punctures or perhaps a toxic liquid splashed on his face by two women who ran away."

(The false needle story had everyone puzzled)

**Detroit News** [5] 2/21

“Determining whether poison killed the half brother of North Korea’s leader in a busy airport is proving difficult for Malaysian officials, who said Tuesday that autopsy results are so far inconclusive.”

(They may be right)

**New York Times** [6] 2/22- “With hands doused with toxic liquid, they rubbed the face of their victim, who was waiting to check in for a flight at Kuala Lumpur International Airport. Minutes later, their target died on the way to a hospital. The two women washed their hands and fled.”

(Dousing hands with VX is not something you want to try)

**CNN**, 2/23 [3]: Kim Jong Nam didn’t have a heart attack and the medics who conducted his autopsy found no obvious puncture marks or wounds

(The absence of puncture marks is consistent with VX. And a million other poisons.)

**But, then other statements appear to contradict, or at least raise doubt whether VX was the poison:**

**CNN** [7]- 2/23 Feeling dizzy, he then went to an airport customer assistance counter to seek medical help. Kim was taken to a clinic on the premises, which decided to call an ambulance and send him to the hospital. He died en route.

(This is not consistent with VX. The symptoms CNN described are nearly bad enough to fit)

Now things get even more interesting...

**New Scientist** [8] 2/24 “Was Kim Jong-nam killed by VX nerve gas? Doesn’t look like it”

“Chemical weapons experts are mystified. ‘I have more questions than answers at this point,’ says Richard Guthrie, formerly of the Stockholm International Peace Research Institute. VX is the most toxic substance known (2) – 10 milligrams of the oily liquid on your skin, less than a drop, is lethal. But Kim took some time to show any symptoms, while the poison was handled by unprotected assailants, and didn’t contaminate other people. That is what makes Kim’s case so strange. [Victims] go into convulsions, froth at the mouth, turn blue and display other telltale symptoms.”
“[Cameras] show Kim walking apparently steadily to solicit help for several minutes, with none of
the usual symptoms such as spasms or foaming at the mouth.”

(A meal at Applebee's will do the same)

“The attacker was handling a cloth with no apparent protection, not wielding a syringe. The women are then said to have run to a washroom to wash their hands, where one vomited. Both are consistent with VX. But nothing else seems to have happened to them, even though they were apprehended soon after.”

This is really weird, because...

“Any splash of a tiny droplet anywhere on her body would have resulted in some symptoms,” says chemical weapons expert Jean-Pascal Zanders . “She was jailed, but nothing like that was reported.”

(Someone holding a rag that was soaked with VX is not going to be fine sitting in jail)

CNN [7] 2/23- “Dr. Victor Weedn (3): Maybe a new kind of nerve agent. There’s these things called Novichok agent agents that were designed by Russia to really keep labs from identifying the poison (4).”

NBC [9] 2/24  Malaysian police revealed Friday that Kim Jong-Nam’s body contained traces of VX [10], a colorless, odorless, tasteless liquid that's deadly in microscopic amounts.

(I guess we'll see)

Just like last week, we have conflicting information. It's a pretty good bet that VX was used, although there are some conflicting data and opinions. But it is universally accepted that the guy is still dead.

Notes:

(1) Of all the people who wrote in trying to guess what the poison was, only one chemist named "indoleman" got it. I would suggest that you don't piss him off. Kale was the most popular guess, hands down.

(2) This is incorrect. Botulinium toxin is about 15,000-times deadlier [11] than VX.

(3) Victor Weedn is a forensic pathologist and former medical examiner. He was an early pioneer in the use of forensic PCR DNA, which is used to detect and identify DNA from crime scences.

(4) This is quite easy. An analysis of an unknown chemical involves the use of a gas chromatography-mass spectrometer (GC-MS). Two types of information are provided- 1) the amount of time that the chemical takes to get through the GC column (this is called retention time); 2) The molecular weight of the chemical. If VX is injected into the GC, it will come out at a certain
time, and show a molecular weight of 267 (C₁₁H₂₆NO₂PS). These data are fed into a computer, and VX should pop out of the database. But it is very easy to make one or more small changes to VX, and it is all but certain that the new molecule will be a deadly poison as well. But, the retention time on the column will probably be different, and the molecular weight will surely be. If it is a new chemical, the computer will not have an answer. This could be what is going on here.

For background, on neurotoxicity of acetylcholineesterase inhibition, see:

"Organophosphates: Zika Caused Florida To Embrace Insecticides Way More Toxic Than DDT [12]"