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Can Xanax Kill You?

By Josh Bloom — April 24, 2019

Is Xanax A Stone Cold Killer Or Just Another Drug? Photo: WebMD [1]

From Then They Came For My Xanax - Opioid Madness Metastasizes [2] (August 9, 2018):

"Self-righteous busybodies, apparently not content with the carnage caused by their magnificently inept mishandling of the fake opioid crisis have taken up a new cause - one that will make many of you anxious. They are now concerned about an increase in the number of prescriptions written for another class of drugs - benzodiazepines, such as Xanax and Valium, which are used to treat anxiety."

The busybodies, even though they've taken some pretty good hits lately, courtesy of the FDA [3] and even the CDC [4], aren't going to go away. As long as there are lives to interfere with there will be busybodies to interfere with them.

Xanax attracts the most attention of the benzodiazepines - it is the most prescribed drug in the class - so I thought it might be interesting to see how dangerous the drug really is (by itself). It is virtually impossible to kill yourself with a Valium overdose. (See Can Valium Kill You? [5]). Does the same hold true for Xanax? Pretty much.

In rats, the LD_{50} - the single dose that will kill 50% of test animals - ranges from 331-1271 [6] mg of drug per kilo of body weight, the equivalent of 76-292 mg, hundreds of 0.5 mg pills. If you could mathematically predict a lethal dose in humans based on the rat LD_{50} data (you can't), the number of pills needed to kill a person would be in the tens of thousands. Nonetheless, these values are qualitatively useful; they can distinguish between drugs that are highly toxic and those that are not. Based on rodent data Xanax (alprazolam) would not be expected to be especially deadly to humans.

In the real world, this appears to be the case. But there are no human toxicity studies, so we can only look to the literature for case studies about the toxicity of Xanax in people. There isn't much there.

- Wolf, et.al., (2005) examined alprazolam-related deaths in Palm Beach County. Of the 178 cases, only two were attributed to alprazolam alone. The majority of deaths were due to combined drug toxicity, mostly from cocaine, methadone, and heroin. **(1)**.
- Jenkins, et. al., (1997) of the Office of the Chief Medical Examiner in Baltimore, reported the suicide of a 44-year old woman with ongoing psychiatric problems. The deceased woman's current medications were alprazolam, fluoxetine (Prozac), phenytoin, lorazepam (Ativan), and venlafaxine (Effexor). The medical examiner ruled that the cause of death was alprazolam intoxication. Analysis of the blood revealed a concentration of 2.1 mg of alprazolam per liter - the highest ever reported in the literature **(2)**. There is no way to estimate from a single blood concentration how much Xanax she consumed, but that is a seriously high blood concentration for any drug; it must have been quite a bit.
- In a retrospective study (2004), Isbister and colleagues examined 2063 single benzodiazepine overdose admissions **(3)**. Of these, 131 admissions were due to alprazolam overdoses and 823 due to diazepam (Valium). The remaining were due to other benzodiazepines. But people who overdosed with alprazolam were 22% more likely to be admitted to the ICU and also to be comatose. No deaths were reported. The authors concluded that "alprazolam was significantly more toxic than other benzodiazepines."
- Kakkar and Kumar, writing in the Journal of Indian Academic Forensic Medicine [7]**(4)**, described the attempted suicide of a woman who was undergoing treatment for severe depression. She consumed 60 mg of Xanax - 120-times the "normal" **(5)** dose. When she was brought into the ER she was comatose and needed to be intubated. Ten hours after intubation she was able to breaths on her own. After 24 hours she regained consciousness and was released one day later with no neurological complications. After 48 hours she walked out of the hospital.

There are some take-home lessons from these few reports:

Although the safety profile of Xanax is inferior to that of Valium, it is surprisingly safe **(6)**, especially when compared to other common drugs. The lethal dose of Xanax is approximately 10-1,000-times that of its maximum recommended dose. Let's pick 100-times. By contrast, this ratio of toxic dose/maximum recommended dose is much lower for the following common drugs (lower numbers indicate a greater risk of a fatal overdose from ingesting large amounts of the drug) **(7)**:

- Tylenol 2-7X

- Aspirin 9X
- Benadryl 4-25X
- Ritalin ~3X

Keeping in mind that these are very rough estimates, yet there are a whole lot of common drugs out there that have a much higher fatal overdose potential than Xanax. The drug is very useful for anxiety and panic attacks but can cause addiction and dependency, and becomes far more dangerous in combination with other drugs. Much like any other drug Xanax has risks and benefits. It should not be handed out like candy but it is not the molecular miscreant that the addiction "experts" claim it is. You are more likely to die from a bottle of Tylenol **(8)**. Or busybodies.

NOTES:

(1) B. Wolf, et. al., The American Journal of Forensic Medicine and Pathology: March 2005 - Volume 26 - Issue [8]1 - pp 24-27

(2) Journal of Analytical Toxicology, Vol. 21, May/June 1997

(3) Isbister et.al., Br J Clin Pharmacol. 2004 Jul;58(1):88-95. Review.

(4 Kakkar and Kumar, J Indian Acad Forensic Med. October-December 2014, Vol. 36, No. 4

(5) It is difficult to determine a "normal" dose of Xanax. For anxiety, it is 0.25-0.50 mg three times per day. For panic disorders, doses as high as 10 mg/day are used. This is why all comparisons to other drugs are crude approximations.

(6) I am discussing only *acute toxicity* of Xanax alone - the risk of death from a single dose - not addiction potential, withdrawal, or the risk of death when other drugs, especially alcohol, are used. These are very different issues.

(7) These multiples are *very* rough estimates of the relative risk of overdose deaths of Xanax compared to four other common drugs. Data were from multiple sources, some of which differed significantly from each other. The numbers are qualitative, not quantitative. It can be reasonably concluded that the risk of a fatal overdose of Xanax from swallowing a bottle of pills is significantly less than for Tylenol, etc.

(8) No, I'm not kidding. Neurologist and pain management physician Dr. Aric Hauskenect calls Tylenol "by far the most dangerous drug in the world." See Pain In The Time Of Opioid Denial: An Interview With Aric Hausknecht, M.D [9]."

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[3] https://www.fda.gov/Drugs/DrugSafety/ucm635038.htm
[4] https://www.asco.org/sites/new-www.asco.org/files/content-files/advocacy-and-policy/documents/2019-CDC-Opioid-Guideline-Clarification-Letter-to-ASCO-ASH-NCCN.pdf
[5] https://www.acsh.org/news/2017/01/04/can-valium-kill-you-10675
[6] https://www.accessdata.fda.gov/drugsatfda_docs/label/2011/018276s045lbl.pdf
[7] http://medind.nic.in/jal/t14/i4/jalt14i4p432.pdf
[8] https://dev-journals2013.lww.com/amjforensicmedicine/toc/2005/03000
[9] https://www.acsh.org/news/2017/07/30/pain-time-opioid-denial-interview-aric-hausknecht-md-11628