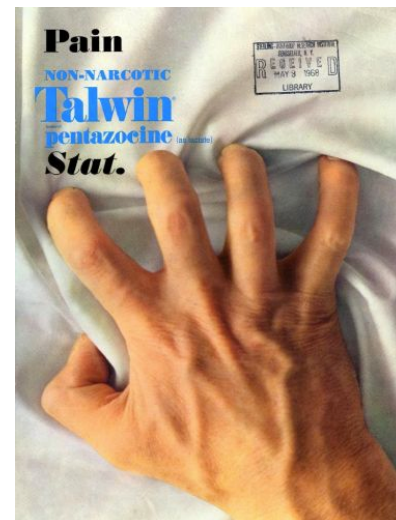


Five Minute Tox Talk: Pentazocine (Talwin®)

February 24, 2015

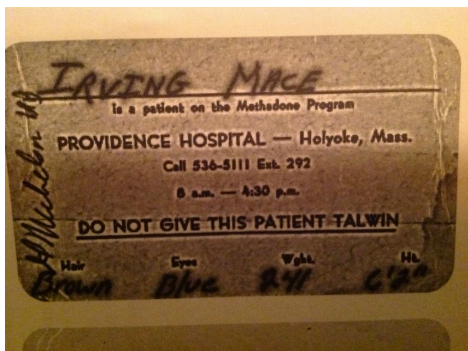
Historical Significance:

- FDA approved in 1967 for pain control
 - initially classified as a schedule V substance (“low potential for abuse”)
 - “...[T]he addictive liability of pentazocine was so low that it was of no clinical significance” (Ahlgren and Stephen 673).
- 1971: petition filed to reclassify pentazocine as having a higher potential for abuse
- 1979: reclassified as a schedule IV substance
 - first successful petition to reclassify a substance under the Controlled Substances Act
- T’s and Blues: pentazocine (Talwin) combined with the antihistamine tripeleminamine (a blue tablet)
 - abused, especially in Chicago and other surrounding Midwestern cities
 - reportedly gives a “rush” indistinguishable to heroin
 - abuse among opioid-dependent individuals uncommon due to withdrawal
 - more commonly abused by “the medical community and patients” initially (Showalter 1224).
- often dissolved and injected IV until naloxone was added to the formulation as Talwin NX
- little to no clinical use today



Pentazocine Pharmacology:

- an agonist-antagonist
 - κ agonist
 - κ_1 agonism: analgesia
 - κ_2 agonism:
 - dysphoria
 - psychotomimetic effects at high doses
 - σ agonism also possibly responsible
 - salvinorin A also a κ_2 agonist
 - μ antagonist: may cause withdrawal in opioid-dependent patients
 - other agonist-antagonists: buprenorphine (partial agonist/agonist-antagonist), butorphanol, nalbuphine, nalorphine,
- clinical effects
 - similar to other opioids in general
 - less consistent miosis with use due to predominant κ agonist effects
 - ceiling effect on respiratory depression (but can still be lethal)



Pentazocine Toxicity Treatment:

- treat similarly to other opioid toxic patients
- use naloxone to support adequate respiration and oxygenation

Miscellaneous:

- Dixon et al., 1970: double-blind comparison of sedative and cardiorespiratory effects of diazepam, pentazocine and combined diazepam with pentazocine in surgical premedication
 - diazepam and pentazocine equally effective for sedation with no significant changes in vital signs and arterial blood gas measurements
 - combined diazepam and pentazocine more effective, still with no significant changes in vital signs and arterial blood gas measurements
- Nakamura et al., 2004: examined whether or not intrathecal morphine, buprenorphine or pentazocine cause spastic paraparesis after spinal cord ischemia in a rat model
 - previous studies implicating morphine as a cause of spasticity after ischemic insult to spinal cord
 - spinal cord ischemia induced by short period of thoracic aortic clamping to simulate theoretical ischemic event related to thoracic aortic surgery
 - after awakening from surgery, animals randomized to receive intrathecal saline, morphine, buprenorphine or pentazocine
 - only morphine-treated animals developed spastic paraparesis
 - no effect of buprenorphine or pentazocine
 - authors conclude that opioid-induced motor dysfunction after a period of ischemia is opioid-specific and not induced by all opioids
 - possibly due to differences in receptor activation between different opioids?

Dr. PANIO.

We have also identified small numbers of housewives, neighbors, friends, who use low doses of Talwin orally, four to six pills per day. Some of these women are grandmothers, never had drug abuse histories or prior records of treatment or prior significant medical histories. They are injecting these drugs into their buttocks and hips.

Mr. NELLIS. Who supplies?

Dr. PANIO. They are getting it on the street.

Mr. NELLIS. Grandmothers are buying Talwin on the street?

Dr. PANIO. That's right.

Mr. NELLIS. Thank you.

Sources:

- Ahlgren EW and Stephen CR. Laboratory and clinical experience with a new analgesic...pentazocine. *Anest Analg.* 1966;45(5):673-682.
- Dixon HR, Tilton BE, and Briggs BD. A comparison of the sedative and cardiorespiratory effects of diazepam and pentazocine for premedication. *Anesth Analg.* 1970;49(4):546-550.
- Nakamura S, Kakinohana M, Sugahara K, et al. Intrathecal morphine, but not buprenorphine or pentazocine, can induce spastic paraparesis after a noninjurious interval of spinal cord ischemia in the rat. *Anesth Analg.* 2004;99:1528-1531.
- Nelson LS and Olsen D. Chapter 38. Opioids. In: Nelson LS, Lewin NA, Howland M, Hoffman RS, Goldfrank LR, Flomenbaum NE, eds. *Goldfrank's Toxicologic Emergencies, 9e*. New York, NY: McGraw-Hill; 2011.
- Showalter CV. T's and blues; abuse of pentazocine and tripeleminamine. *JAMA.* 1980;244:1224-1225.