



Case Report

Suicide by Duragesic transdermal fentanyl patch toxicity

Abstract

Duragesic (Ortho-McNeil-Janssen Pharmaceuticals, Inc., Raritan, NJ) is a transdermal system providing continuous systemic delivery of fentanyl, a potent opioid analgesic, used for managing moderate to severe chronic pain. We report a case of a 42-year-old woman who committed suicide via the application of multiple Duragesic patches.

Duragesic is a transdermal system providing continuous systemic delivery of fentanyl, a potent opioid analgesic, used for managing moderate to severe chronic pain. Serum fentanyl levels achieved with the patch equal those of continuous intravenous infusion. Fentanyl toxidromes include respiratory and central nervous system depressions and miosis [1]. Toxicity and fatalities have been described after intravenous, rectal, and ingestion of transdermal fentanyl patches, but suicide via transdermal application is rarely described. We report a case of a 42-year-old woman who committed suicide via Duragesic overdose.

A 42-year-old woman was found in cardiopulmonary arrest beside a suicide note. The patient presented to the emergency department in asystolic cardiac arrest and could not be resuscitated. Skin examination was significant for 11 Duragesic 100 $\mu\text{g}/\text{h}$ patches applied to the patient's anterior chest wall. The medical examiner ruled the cause of death as fentanyl toxicity. Postmortem toxicologic screens were significant for a fentanyl concentration of 77.5 ($\mu\text{g}/\text{L}$ or $\mu\text{g}/\text{kg}$) and ethanol (82 mg/dL).

Extended-release analgesics such as Duragesic are beneficial for those with chronic pain; unfortunately, other serious medical problems and death have occurred with accidental exposure to Duragesic. Examples include transfer of a Duragesic patch from an adult's body to a child while hugging, accidental sitting on a patch, and possible accidental exposure of a caregiver's skin to the medication in the patch while the caregiver was applying or removing the patch. A study has shown that a used patch, depending on size, will still contain 0.7 to 8.4 mg or 28% to 84% of fentanyl [2].

Therefore, disposal is paramount as even a used patch will still contain toxic levels of fentanyl and should be flushed down the toilet after use to prevent accidental exposure.

All patients and their caregivers should be advised to avoid exposing the Duragesic application site to direct external heat sources, such as heating pads or electric blankets, heat lamps, saunas, hot tubs, and heated water beds, and others, while wearing the system. There is a potential for temperature-dependent increases in fentanyl released from the system resulting in possible overdose and death.

There have been increases in fentanyl patch abuse through various methods, such as ingestion, injection, or inhalation because contents of the patch can be extracted. Drug Enforcement Administration figures state that prescriptions have risen from 0.5 million in 1994 to 5.7 million in 2003. A lollipop version is also available of the drug, but no fatalities have been documented [1].

Our case represents an atypical method of abuse of Duragesic. If converting patients from daily oral morphine to fentanyl patches, the manufacturer recommends 300 $\mu\text{g}/\text{h}$ for the initial 24-hour daily dose per 1035 to 1124 mg of morphine. The application of 11 Duragesic patches at 100 $\mu\text{g}/\text{h}$ each would equal 3795 to 4121 mg of morphine. This dose is well above a potentially lethal dose. Although there have been suicides reported where contents of the patch have been ingested, suicide via excessive application of the system is rare.

Special attention should be given to individuals with chronic pain. Studies have reported that chronic pain is associated with increased risk of suicide. Recent studies have found that 37% of patients receiving opioid therapy from their primary care physicians reported suicidal thoughts, and more than 20% reported a lifetime suicide attempt [3].

In conclusion, proper disposal of used patches and screening of high-risk individuals are critical with fentanyl treatment. A recent study evaluated the use of a Pain Medication Questionnaire for measuring risk for opioid medication misuse for long-term ill patients. Higher scores from the Pain Medication Questionnaire are 2 times more likely to have a substance abuse problem and 3 times more likely to request prescription refills [4].

Frank LoVecchio DO, MPH
*Banner Good Samaritan and
Maricopa Medical Centers
Phoenix, AZ, USA*

Lee Ramos
*Arizona College of Osteopathic Medicine
Phoenix, AZ, USA*

[doi:10.1016/j.ajem.2010.01.035](https://doi.org/10.1016/j.ajem.2010.01.035)

References

- [1] Haroz RA, Greenberg MI. New drugs of abuse in North America. *Clin Lab Med* 2006;30(1):147-64.
- [2] Marquardt KA. Fentanyl remaining in a transdermal system following 3 days of continuous use. *Ann Pharmacother* 1995;29(10):969-71.
- [3] Ilgen MA, Zivin KA, McCammon RJ, Valenstein MA. Pain and suicidal thoughts, plans and attempts in the US. *Gen Hosp Psychiatry* 2008;30(6):521-7.
- [4] Holmes CP. An opioid screening instrument: long term evaluation of the utility of the Pain Medication Questionnaire. *Pain Pract* 2006;6(2):74-88.