A Snapshot of Synthetic Substances: Nursing Implications for Patients Suspected of Psychoactive Drug Use

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Learning Objectives

• Define synthetic substances and their mechanism of action.
  • Specifically focusing on synthetic cannabinoids
• Interpret psychological and physiological clinical presentation of patients after use of synthetic substances.

Magnet Components

• New Knowledge
• Exemplary Practice
Teen Dies In Coma After Smoking Synthetic Marijuana

The parents of 16-year-old Samantha Colburn hope to raise awareness about the dangers of synthetic pot.

Samantha’s story is one of many to emerge in recent years about the deadly effects of synthetic marijuana. The product, which is sold under various names such as “Kush” and “not for human consumption,” can cause a range of serious health problems, including severe hallucinations and violent behavior.

Within 15 minutes, Samantha told her boyfriend she had a “migraine” and went to lie down. After only a short period, she appeared to be in a “psychotic state,” urinating on herself, running herself into walls, hallucinating, and violent behavior.

Police were called, she was taken to the local ED and placed into an induced coma and spent 4 days in the ICU.

What have been your experiences?

Exemplar Case

- Within 15 minutes she told her boyfriend she had a “migraine” & went to lie down.
- After only a short period, she appeared to be in a “psychotic state”, urinating on herself, running herself into walls, hallucinating, & violent behavior.
- Police were called she was taken to local ED and placed into an induced coma & spent 4 days in the ICU.
• The doctors determined she had a severe cerebral stroke with associated vasculitis.
• ICP was 28 mm HG
• Sent to OR for EVD to relieve pressure on her brain
• Jan. 2013, was removed from the ventilator and feeding tube removed (expected to pass w/in 30 minutes)
• Patient survived!
• Currently, is blind, bound to a wheelchair, with permanent brain damage.

http://ireport.cnn.com/docs/DOC-895582

• Video will be here

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**Psychoactive Substances**

![Psychoactive Substances Chart](chart.png)

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Different chemicals, but patient presentation similar

- Present to the ED primarily with manifestations of:
  - Severe agitation and paranoia
  - Tachycardia & palpitations
  - Negative toxicology screen
  - No other pathology to describe signs and symptoms

What are Synthetic Cannabinoids?

- Herbal “incense” products sprayed with synthetically produced cannabinoids
  - Chemicals (of unknown composition or amount) sprayed on plant materials or unknown content
  - Chemicals that mimic the actions or have a similar structure to delta-9-tetrahydrocannabinol (Δ9-THC)
  - Effects “supposed to be” similar to the psychoactive properties of marijuana or delta-9-tetrahydrocannabinol (Δ9-THC)
  - “Catchy” names and “attractive” labeling
The use of synthetic cannabinoids dropped from the 2012 level of 11.3% among 12th graders
A majority of teen users of SCs also use regular THC
Legal Implications

- Federal Analog Act (1986)
  - Comprehensive Drug Abuse Prevention & Control Act (1970)
- Synthetic Drug Abuse Prevention Act (July, 2012)
  (S. Res. S. 3190, 2012)
  - 15 cannabimimetic agents (CB1 receptor agonist) became Schedule I substances
- 2013 Drug Enforcement Administration (DEA) temporarily banned 3 additional substances (UR-144, XLR11, AKB48)
- Feb., 2014 DEA temporarily banned another 4 substances after 221 individuals became ill

Toxicology

- Synthetic Cannabinoids not detected on regular toxicology screen
  - JWH-08/073 first to be tested in 2010
  - Forensic testing
  - Point of care testing now available
  - Primarily for JWH-08/073

www.3mslabs.com
Clinical Manifestations

Psychological
- Delusions
- Hallucinations
- Anxiety**
- Paranoia**
- Agitation
- Seizures
- Dystonia
- Tremors

Physiological
- Nausea
- Vomiting
- Palpitations**
- Tachycardia**
- Diaphoresis
- Dyspnea

** Most pronounced manifestations

Significant Effects
- Stroke
- Renal failure
- Death

Case Study 1-paranoia

- June, 2011, 19-year-old Male, smoked “iAroma” purchased at a tobacco shop in the mall.
- He arrived home and after his friend left he phoned his brother and said, “I smoked that legal stuff and I’m freaking out.”
- 30-minutes later he got into his car and drove through town at speeds between 80-100 mph.
- When the road came to the end.....he never braked.
Case Study 1 cont.

- His car went 80 feet through the air & landed in a house and he was pronounced dead at the scene.

- He had NEVER used illicit drugs or smoked synthetic cannabinoids before!

http://www.tothemaximus.org/

Case Study 2-psychois

- 26 year old male, post-graduate student with no prior mental health history except for ADHD.
- Smoked “Black Diamond” and moments afterwards he became paranoid with delusions. He felt “his hands were going to harm him”
- He placed both hands on the stove (turned on) and as he stated he “attempted to burn them off to get the devil out of him”
- Upon arrival of emergency and fire personnel it took 6 fire fighters and a taser to get him to release his hands from the stove.


Figure 1: Initial emergency department photograph of the dorsum of the left hand.

Figure 2: Initial emergency department photograph of the volar surface of the left hand.
Management
• Very difficult to get a detailed history from patient
• Important to try to determine time, route, & intent of use (recreational vs. suicidal)
• Prior mental health history
• Prior substance abuse history
• You may need to elicit the history from family or friends, however, you may not be able to obtain this information and will need to rely on physiological and psychological manifestations.

Management
• No antidote!
• Supportive Management
  • Airway, breathing, circulation
  • Monitor vital signs, ECG, labs to assess acid/base balance & renal function (urine toxicology screen maybe unhelpful)
  • Benzodiazepines for severe anxiety—first line agent
  • IV fluids-if dehydration or hyperthermia present
  • If hyperthermic (poorer outcomes—MODS) may need cooling blanket to decrease risk of rhabdomyolysis

Management
• Patient & Parental education
  • Synthetic cannabinoids (like all synthetics) have may different names
    • Labeled as potpourri, incense, or tobacco
  • SCs are dangerous, much more so than THC
    • Each individual responds differently each time used
  • SCs are easy to find and purchase
    • Internet, gas stations, or head shops
  • May not show up on regular toxicology screening
Summary

- Despite widespread media coverage, many healthcare providers remain unfamiliar with synthetic drugs such as synthetic cannabinoids (Spice) or cathinones (bath salts).
- Research is needed to better understand the side effects and long-term consequences associated with the use of synthetics.
- Increase availability of toxicological identification of substances is needed along with blanket legislation to curtail creation and distribution of changing synthetic analogues.

Questions

- Thank you for your time and attention
- Spread the word and be alert!
  - "The newest compounds on the street are chemically different than the first generation compounds. They are potent, impairing, and addictive!"
    - B. Logan
- Contact information:
  - tracy.brewer@wright.edu
  - margiestone@hotmail.com

References

  - http://www.samhsa.gov/data/DAWN.aspx
  - NMS Labs. www.nmslabs.com
  - http://www.tothemaximus.org/
  - Detailed reference list upon request