Adolescent Substance Abuse

WHY IT’S A PROBLEM AND WHAT WE NEED TO KNOW AS ANESTHESIA PROVIDERS

BRIDGET L. MULDOWNEY MD
ASSISTANT PROFESSOR OF ANESTHESIOLOGY
UNIVERSITY OF WISCONSIN: SCHOOL OF MEDICINE AND PUBLIC HEALTH
SEPTEMBER 2014

Outline

• Statistics on adolescent substance abuse
• Review the most commonly abused substances
• Anesthetic implications of substance abuse

Disclosures

• No financial disclosures
Case 1

A 17 yo presents to the OR for ORIF of an open radial fracture sustained in a MVC. The patient is restless with a HR of 150, has vomited once, and appears very anxious. He was driving home from a friend’s house. He denies taking any illegal substances.

Case 2

An 18 yo girl presents for a lap appendectomy after a 2-day history of nausea, vomiting, and lower abdominal pain. In the recovery room the patient is writhing in pain despite receiving 4 mg of hydromorphone. Her temperature is 38.8 degrees celsius, HR 120, and she appears very agitated.

Are kids really using drugs that often?

Monitoring the Future Study: 2013
Maybe it’s all just marijuana . . .

Monitoring the Future Study: 2013

<table>
<thead>
<tr>
<th>Substance</th>
<th>% of 12 graders reporting use in the past year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>62.0%</td>
</tr>
<tr>
<td>Marijuana</td>
<td>36.4%</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>8.7%</td>
</tr>
<tr>
<td>Narcotics (excluding heroin)</td>
<td>7.1%</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>4.5%</td>
</tr>
<tr>
<td>Cocaine</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

What drugs are adolescents using/abusing?

It’s marijuana, its harmless . . .

- More likely to get in an automobile accident.
- Adolescent use results in an 8 point decrease in adult IQ that did not normalize when use stopped.
- All the adverse pulmonary effects of cigarette smoke and more
- Increased HR for up to 3 hours after use
- Decreased motivation, decreased educational achievement, and increased risk of mental health issues.

Anesthetic consideration for the marijuana user

- Acute use can cause uvulitis and may cause post op airway obstruction
- Acutely can cause sympathetic surge so avoid other drugs that may potentiate sympathetic nervous system (ketamine, ephedrine)
- Acute users may experience psychiatric side effects during both induction and emergence
- Chronic users may have depletion of catecholamines
- Treat chronic users like chronic smokers

Nguyen, HT. Cannabis (marijuana) and anesthesia. Anesthesiology Rounds: Vol 3, Issue 9

Did you see this commercial?

15% of adolescents report abusing prescription drugs
15% of adolescents report abusing prescription drugs

<table>
<thead>
<tr>
<th>Prescription Drug</th>
<th>% of 12th graders reporting use in the past year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adderall</td>
<td>7.4%</td>
</tr>
<tr>
<td>Vicodin</td>
<td>5.3%</td>
</tr>
<tr>
<td>Oxycontin</td>
<td>3.6%</td>
</tr>
<tr>
<td>Ritalin</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

10-Fold Increase in Stimulant Rx’s Dispensed by US Retail Pharmacies 1991-2010

3-Fold Increase in Number of Opioid Rx’s Dispensed by US Retail Pharmacies, 1991-2010
Where are adolescents obtaining opioids: their doctor or their friend's/relative’s doctor

Vaghari, B et. al. Perioperative Approach to Patients with Opioid Abuse and Tolerance. Anesthesiology News June 2013: 1-4

Anesthetic considerations for the opiate abuser

- When managing acute opiate intoxication, try to avoid antagonist therapy if possible. May precipitate acute withdrawal and make anesthesia and post-op analgesia even more challenging
- Difficulty achieving effective analgesia – maximize non-opioid analgesics
- Opioid tolerant patients need 2-3 times the dose of a opiate naïve patient, yet they are still at risk for respiratory depression
- Be vigilant and reassure patient that withdrawal symptoms will be treated

Opiate withdrawal symptoms

- CNS hyperactivity, anxiety
- Rhinorrhea
- Nausea/vomiting
- Muscle aches
- Fever and sweating
- Tachycardia
- Hypertension
- Diarrhea
- Insomnia

Anesthetic considerations for the stimulant abuser: acute intoxication

- Amphetamine is a powerful CNS stimulant with peripheral alpha and beta actions
- Increased BP with possible reflex bradycardia
- Increased anesthetic requirements
- Case report of severe intraoperative intracranial hypertension with neurologic sequelae


Anesthetic considerations for the stimulant abuser: chronic use/abuse

- Chronic use will deplete catecholamine stores
- Decreased anesthetic requirement
- Decrease the sympathetic response to hypotension (case report of arrest on induction of anesthesia)
- Chronic users develop tolerance which can manifest as depression and fatigue
- Intra-op diminished response to ephedrine
- Takes weeks to replete CNS catecholamine stores.


Case 1

- A 17 yo presents to the OR for ORIF of an open radial fracture sustained in a MCV. The patient is restless with a HR of 150, has vomited once, and appears very anxious. He was driving home from a friend’s house. He denies taking any illegal substances.
Case 1

- A 17 yo presents to the OR for ORIF of an open radial fracture sustained in a MCV. The patient is restless with a HR of 150, has vomited once, and appears very anxious. He was driving home from a friend’s house. He denies taking any illegal substances.
- Patient attended a ‘pill party’ and ingested an unknown amount of prescription stimulant (ADHD medication).

Case 2

- An 18 yo girl presents for a lap appendectomy after a 2-day history of nausea, vomiting, and lower abdominal pain. In the recovery room the patient is writhing in pain despite receiving 4 mg of hydromorphone. Her temperature is 38.8 degrees celsius, HR 120, and she appears very agitated.
- Patient has been taking Oxycontin that she stole from her grandfather’s medicine cabinet as well as purchasing it on the street for the last 4 months.
References

- Dr. Wilson Compton  Deputy Director National Institute on Drug Abuse (personal correspondence)
- Nguyen, HT. Cannabis (marijuana) and anesthesia. Anesthesiology Rounds. Vol.5. Issue 9
- Vaghari, B et. al. Perioperative Approach to Patients with Opioid Abuse and Tolerance. Anesthesiology News June 2013; 1-4