

Inhaled Poisons- Inhalant abuse

Etiology/ Pathophysiology

- Inhalant abuse is seen mainly in adolescents and young adults. Inhalants are products that contain dangerous chemicals that produce a euphoric “high” feeling when inhaled. Products that contain chemicals such as toluene, butane, and other certain solvents are more commonly used because of their cheap and easy access in the United States.
- Chemicals like butane, toluene, and solvents are found in many household items.
 - Butane is found in gas tanks and lighter canisters.
 - Toluene is found in glues, markers, paints, and paint thinners/ removers.
 - Other solvents are found in aerosol computer cleaning products, aerosol dispenser such as whipped cream canisters, and hair spray canisters.
- The biggest population for inhalant abuse is seen in high school students.
 - On average, 9 in 1000 United States children between the age of 12 and 17 are currently misusing inhalants.
 - 11 percent of high school students have reported they have used inhalants in their lifetime.
- These chemicals are rapidly absorbed into the blood stream causing a quick change to the central nervous system when inhaled causing central nervous system depression.
 - Signs and symptoms: euphoria “feeling high”, dizziness, slurred speech, and lack of coordination, confusion, tremors, and weakness.
 - Further CNS depression: ataxia, lethargy, coma, possible seizures, and respiratory depression.
- The cardiovascular system experiences negative effects from inhalant abuse.
 - Signs and symptoms: Arrhythmias, palpitations, syncope, and shortness of breath.
- Sudden sniffing death syndrome can happen usually the first time a chemical is inhaled that is then followed up by some form of physical activity such as running. The myocardium blocks the potassium current causing a prolonged repolarization leading to hypoxia and death.
- Inhalants may be sniffed, huffed, or bagged. Each technique delivers a different concentration of the substance.
 - Sniffing is when the chemical is inhaled directly from the source/canister.
 - Huffing is when a cloth has the chemical on it and it is being inhaled by holding the cloth to the nose or mouth.
 - Bagging is when the chemical is inserted into a bag and the bag is then placed over the head where their nose and mouth can inhale the chemical.

On Scene Treatment

- ABCs is the number 1 priority.
 - Assess airway- ensure airway is patent.

- Assess respirations- labored or unlabored breathing, shallow or deep, and use of any accessory muscles? Lung sounds?
 - If respirations are inadequate, provide positive pressure ventilation with a bag valve mask with oxygen attached.
 - If respirations are adequate, apply a nonrebreather mask for 15 lpm.
- Assess circulation – pulses- weak, strong, or thready? Skin color? Body temperature?
- Obtain a history.
 - What chemical was inhaled?
 - How long was the exposure to the chemical?
 - How was the chemical inhaled?
 - How long over time has the chemical been inhaled?
 - History of attempted suicide?
- Butane and other hydrocarbon chemicals are extremely flammable. Assess for any chemicals on skin or clothes.
 - “Glue-sniffers rash” is dermatitis of the skin around the mouth caused by the drying of the hydrocarbons. Characterized by and pruritis and erythema around the mouth.
- Patient should be placed in a supine position, positive pressure ventilation/ or oxygen by a non-rebreather should be administered, and all evidence of possible chemical inhaled should be brought to the emergency department to be evaluated.

ED Treatment

- Follow ABC’s
 - Airway, breathing, and circulation is the number 1 priority upon arrival to the emergency department.
 - Administer 100% oxygen by a nonrebreather mask. May need to intubate.
- Obtain a urine culture for a urine toxicology screen.
 - Depending on exposure and how recent the chemical was inhaled may not be able to be detected on a tox screen.
- Other diagnostic tests include: EKG, CT of the head, MRI, BMP, and a CBC
- Continuous vitals and cardiac monitoring should be implemented.
- Correct electrolyte imbalances – potassium or sodium supplements.
- Do not give epinephrine or norepinephrine for arrhythmias caused by inhalants.
 - Can irritate the myocardium worsening the arrhythmias. Instead treat arrhythmias with amiodarone, lidocaine, propranolol, or esmolol to relax the heart.

Role of the ED Nurse

- Follow ABC’s
 - Airway, breathing, and circulation is the number 1 priority upon arrival to the emergency department.
 - Administer 100% oxygen by a nonrebreather mask. May need to intubate.
- Continuously monitor level of consciousness and vitals signs
- Strict I and O.
- Assess mental health.

- Patients, especially adolescents, should be screened for suicide and substance use disorder.
- Obtain a history of the inhalant abuse – what chemical/drug? How long? How much?
 - Are there any other drugs being abused or in their system while in the ED?
- Provide support- establish good rapport.

Discharge/ Prevention Instructions

Discharge

- Possible referral for substance abuse disorder treatment facility.
- Possible referral for counseling.
- Signs and symptoms of possible long term cardiac and neurological symptoms and when to seek help.

Prevention

- Promote awareness to parents and schools.
 - Provide information in pamphlets and at the doctor's office of warning signs parents and school faculty could identify.
 - "Glue-sniffers rash".
 - Multiple rags/bags in children's room or cars.
- Provide counseling to children who are experiencing depression, self-harm, or suicide thoughts.

References

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