Zaporozhye State Medical University

Chair of Medicine of Catastrophes, Neurosurgery and Military Medicine

Lecture: Critical Care on Acute Poisoning

Lecturer: Mirniy Sergey Petrovich, assistant, candidate of medical sciences

Topic: Acute Alcohol Poisoning

- **Alcohol poisoning** (AP) is a serious – sometime deadly – result of consuming dangerous amounts of alcohol.
- AP most often occurs as a result of drinking too many alcoholic beverages over a short period of time.
- AP can also occur by: ethanol, isopropyl alcohol (isopropanol) or methyl alcohol (methanol).

Signs and symptoms of AP

- **may include:**

- CONFUSION, STUPOR
- VOMITING
- SEIZURES
- SLOW OR IRREGULAR BREATING
- PILE SKIN OR BLUE-TINGED SKIN
- HYPOTERMIA
- UNCONSCIOUSNESS

CAUSES:

- **AP may result from accidental and intentional ingection:**
- ETHANOL is found in alcoholic beverages as well as common household items such as after shaves, colognes, perfums, mouthwashes
- **ISOPROPYL ALCOHOL is common found in rubbing alcohol, lotions, certain hand gels, antifreeze**
- **METHANOL** is found in items such us solvents, paints, varnishes, antifreeze.

Test and diagnosis:

- Visible signs and symptoms of AP
- Order blood tests to check blood alcohol levels
- Low blood sugar (may be)
- Urine test on AP

Ethylene glycol toxicity

Occurs in 3 stages:

First stage, called the neurologic phase, can occur in less than 1 hour after ingestion and last up to 12 hours. Hypocalcemia, abnormal reflexes.

Second stage, which occurs between 12 and 24 hours after ingestion - cardiopulmonary stage. Occur tachycardia, hypertension, ARDS, hypocalcemia, arrhythmias.

Third stage - renal stage.

Causes

Ethanol may be ingested accidantally, as ofthen occurs in children.

Methanol ingestion may result in serious consequences, including blindness and death. Recognition and timely treatment are essential for a full recovery. Main symptoms:

Visual disturbances, headache, vertigo. GI: nausea, vomiting, abdominal pain.

Isopropanol:

CNS complaints include headache, dizziness, poor coordinations, confusion. GI: abdominal pain, nausea, vomiting, gastritis with hematemesis.

Physical Signs

Ethanol: flushed face; diaphoresis. Ataxia, slurred speech; drowsiness; stupor or coma

Methanol:

Retinal edema, hyperemia of the optic disc, optic atrophy. CNS signs: dyspnea, Kussmaul respiration. Cardiac signs: hypotension, bradycardia. Severe abdominal tenderness.

Isopropanol:

- Nystagmus or myosis
- Sinus tachycardia
- Coma, respiratory depression
- Hypotension

Lab. Studies

Ethanol: increase serum blood alcohol level,

anemia. Elevation of hepatic transaminase levels. Prolongation of the prothrombin time.

Isopropanol:

- Increase serum isopropanol level
- Serum ketones will often be positive
- Serum creatinine level can be elevated

Ethylene glycol:

- Increase serum EG level
- Increase serum creatinine level
- Evidence of fluorescence

Treatment

- AP treatment usually involves supportive care
- CAREFUL MONITORING
- Airway protection to prevent breathing or shoking problems
- Oxygen therapy
- Administration of fluids through a vein to prevent dehydratation

Emergency Department Care

Methanol

Forced diuresis; using sodium bicarbonate, administer folic acid (leucovorin), antidotal treatment: involves blocking alcohol dehydrogenase. This enzyme can be inhibited by ethanol or fomepizole. Ethanol is competetive inhibitor of alcohol dehydrohenase. Hemodialysis.

Isopropanol.

Treat hypotension with fluids and pressors

initiate emergent hemodialysis.

Complications

- Ethanol ingestion complications.
- Hypoglycemia is common.
- “Holiday heart” in which dysrhythmias.
- Atrial fibrillation.
- Cyrrosis, esophageal varices, erosive gastritis.
- Isopropanol ingestion: hemorragic gastritis.
- Methanol ingestion: blindness, acidosis, coma, cardiovascular collapse.

Toxicity, Carbon Monoxide

- Carbone Monoxide (CO) is a colorless, odorless gas produced by incomplete combustion carbonaceous material.

- Increasing evidence implicates ambient urban CO levels in rates of angina, arrhythmias, and cardiac arrest.

Symptoms of acute poisoning CO

- Dyspnea on exertion
- Malaise, flulike symptoms, fatique
- Lethargy, confusion, depression
- Impulsiveness, distractibility
- Hallucination, agitation
- Nausea, vomiting, diarrhea
- Abdominal pain
- Headache, drowsiness
- Dizziness, weakness, confusion
- Visual disturbance, syncope, seizure

Physical examination:

- Tachycardia, hypertension.
- Hyperthermia, marked tachypnea
- Classic cherry skin is rare, pallor is present more often
- Retinal hemorrages, pappilledema
- Noncardiogenic pulmonary edema
- Neurologic disturbances (memory-amnesia), emotional lability, gait disturbance, movement disorders

Lab. Studies

- HbCO analysis (elevated level)
- Arterial blood gas
- Metabolic acidosis
- Troponin, creatinninekinase-MB, myoglobin
- Myocardial ischemia or depression
- Complete blood count
- Hypokalemia, hyperglycemia
- Urinalysis (positive for albumine)

Imaging Studies

- Chest Radiography
- CT – scanning
- Electrocardiogram (sinus tachycardia, arrhythmias)
- Neuropsychologic testing

Emergency Department Care

- Oxygen therapy
- Intubation for the comatose patients
- Cardiac monitoring, pulse oximetry
- Hyperbaric oxygen therapy
- Serial neurologic examinations (CT-scan)
- Admission to a toxicology service
- A portable Hyperbaric chamber (Gamow Bag) has been used for several years in-the-field treatment

Prognosis

- Variability of clinical severity, laboratory values and outcome limits prognostic accuracy.
- Cardiac arrest, coma, metabolic acidosis are associated with poor outcome.
- Abnormal findings on CT-scanning are associated with persistent neurologic impairment.
- Neuropsychiatric testing may have prognostic efficacy in determing delayed sequale.