

# Alcoholism

A large number of individuals have the disease characterized by addiction (compulsion and craving despite consequences) to alcohol; clinical syndromes related to direct effect of EtOH and secondary adaptive response to excess EtOH; EtOH is rapidly absorbed and metabolized; hepatic dysfunction usually takes 10-15 y to develop but cirrhosis may develop after one or more acute episodes

## ANESTHETIC CONSIDERATIONS:

- Multi-system disease
  - CV: Dilated cardiomyopathy, CHF
  - RESP: Probable smoker with COPD – risk of HTN, stroke, DM, GI disease
  - GI: Liver cirrhosis
    - Ascites, encephalopathy, bilirubin levels, obtundation, malnutrition
    - Portal hypertension
    - Gastric and esophageal bleeding
    - Pancreatitis
  - CNS: Thiamine replacement
    - Wernicke-Korsakoff's (memory, confusion)
    - Peripheral neuropathy, ataxia, CN VI
    - Withdrawal risk and seizures
  - Malnutrition
  - Concomitant use of amphetamines, cocaine, diazepam
- Increased risk of aspiration in acute intoxication
- Acute intoxication
  - Uncooperative
  - Decreased MAC
  - Dehydration with electrolyte abnormalities
- Chronic abuse
  - Increased MAC
  - Multisystem disease

## ANESTHETIC GOALS:

- Aspiration prophylaxis
- Assess for cardiomyopathy and severe liver dysfunction and optimize anesthetic as required
- Consider nutritional support including thiamine and vitamin B<sub>12</sub>
- Anticipate withdrawal and treat appropriately

## HISTORY

- Cardiomyopathy, arrhythmias, hypertension (orthopnea, nocturnal urination, coughing, leg swelling)
- Erosive gastritis, hepatic cirrhosis, acute hepatitis, pancreatitis, fatty liver (history of bleeding, easily bruised, anorexia, n/v)
- Gynecomastia, testicular atrophy, irregular menses
- Leukopenia, anemia, thrombocytopenia
- Wernicke's syndrome, Korsakoff's syndrome, peripheral polyneuropathy, cerebellar degeneration (amnesia, impaired reasoning)
- See liver failure seminar

## PHYSICAL

- **GENERAL** – appearance (malnutrition)
- **CVS** – dyspnea, BP sitting and lying, HR
- **GI** – ascites, jaundice, hepatomegaly, “spider” angiomas, abdominal pain
- **CNS** – sixth nerve palsy, ataxia, CNS exam, distal numbness and paresthesias, unsteady gait

## INVESTIGATIONS

- **Labs**
  - CBC (all cell lines can be down)
  - Coagulation profile (elevated in hepatic failure)
  - Lytes - ↓ K, Mg, Na
  - Amylase (risk of pancreatitis)
  - LFTs
  - Blood EtOH and toxicology screen if indicated
- **Imaging**
  - ECG (arrhythmias)
  - ECHO (cardiomyopathy)
- **Special**
  - Upper endoscopy

## OPTIMIZATION

- Aspiration prophylaxis
- Normalization of fluids and electrolytes
- Consider treatment of nutritional / metabolic deficiencies
  - Thiamine / vitamin B12

## ANESTHETIC OPTIONS

- Local and regional okay if patient cooperative

- Polyneuropathy is a relative contraindication to regional anesthesia
- GA esp. if uncooperative, cardiac involvement, severe hepatic involvement

#### ANESTHETIC SETUP

- **Drugs**
  - Routine
- **Equipment**
  - Routine CAS
  - Consider invasive monitoring for severe cardiomyopathy and hepatic dysfunction

#### MANAGEMENT OF ANESTHESIA

- **Induction**
  - Full stomach considerations in acute intoxication
  - Consider long-acting benzodiazepine or barbiturate
  - Anesthetic doses increased in chronic disease (upregulation of liver metabolism etc.)
  - Decreased dose in acute intoxication (EtOH depresses CNS function)
  - RSI in acute intoxication
- **Maintenance**
  - Requirements vary by age, general health, nutrition and hydration states, concomitant disease
- **Emergence**
  - Ensure return of airway reflexes (may require postoperative ventilation)

#### DISPOSITION & MONITORING

- Provide adequate analgesia in PACU
- Anxiety can worsen withdrawal symptoms
- Withdrawal syndrome may develop within 6-8 h; treat with IV EtOH,  $\beta$ -adrenergic agonist,  $\alpha_2$ -adrenergic agonist, benzodiazepines, PO EtOH
- DTs develop in 5% of patients in withdrawal
- 10% mortality secondary to hypotension, arrhythmias; treat with diazepam,  $\beta$ -adrenergic agonist

#### COMPLICATIONS

- Recognition and treatment of withdrawal important, as significant mortality occurs if inadequately treated

#### PATHOPHYSIOLOGY

- EtOH abuse in people within US: 15 million
- Alcoholic physicians in US: 22,000
- Third leading cause of death and disability
- Male gender and family history major risk factors
- Three concepts of relevance in the neurobiology of addiction to anesthesiologists:
  - Uniform drug reward and reinforcement
  - Cross-addiction
  - Disease permanence
- The mesocorticolimbic dopamine system (Fig. 1) is central to the pathophysiology of addiction and relapse
- This neurocircuitry involves the ventral tegmental area of the midbrain where dopaminergic neurons originate, and the basal forebrain, the nucleus accumbens, and the amygdala to which these neurons project
- All drugs abused by humans have been shown in animals to interact with this system to produce reinforcement
- Different pharmacological classes of drugs of abuse, including many of those routinely used by anesthesiologists, may initially activate different locations within the reinforcement cascade by several mechanisms, but all lead to reward stimulation
- As a result, exposure to one drug may mimic the reinforcing effects of another; this phenomenon is termed “cross-addiction”
- Permanent alterations in reinforcement neurocircuitry also appear to persist despite long-term abstinence, and support the clinical notion of addiction as a chronic, incurable disease
- These data further suggest that the administration of drugs of abuse commonly used during and after anesthesia may reactivate addiction regardless of the relative length of abstinence

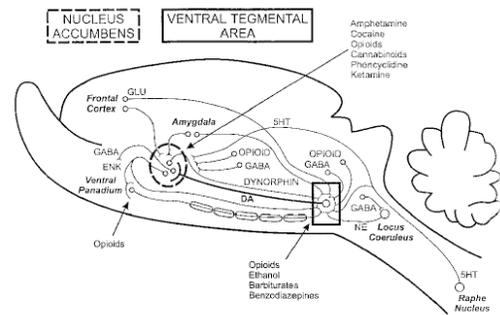


Figure 1. Schematic illustration depicting major neural reinforcement circuitry in the rat brain. The nucleus accumbens and ventral tegmental area are identified by the dashed oval and the solid rectangle, respectively. DA = dopamine, NE = norepinephrine, GLU = glutamate, 5HT = 5-hydroxytryptamine, ENK = enkephalin, GABA =  $\gamma$ -aminobutyric acid. Adapted with permission of the author (16) and publisher.

#### REFERENCES

- Roizen & Fleisher – Essence of Anesthesia Practice – p10
- Judith A. May, Herbert C. White, Ardis Leonard-White, David C. Warltier, and Paul S. Pagel - The Patient Recovering from Alcohol or Drug Addiction: Special Issues for the Anesthesiologist - Anesth Analg 2001;92:1601-8