ALCOHOL WITHDRAWAL SYNDROME

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ACGME CORE COMPETENCIES

- Medical Knowledge
- Patient Care
- Interpersonal Skills
- Practice Based Learning
- Systems Based Learning
- Professionalism
CASE PRESENTATION

- xx year old male was admitted for elective right hemi-colectomy.
- Outpatient screening colonoscopy showed a cecal mass - moderately differentiated adenocarcinoma.
- ROS: 30 lbs weight loss in 8 weeks.
CASE PRESENTATION

PMHx:
- Diabetes Mellitus
- Coronary Artery Disease
- Chronic Obstructive Pulmonary Disease

PSHx: Removal of sharpnel from right shoulder.

Home Medications: Lopressor, albuterol, atrovent

Social History:
- Alcohol - 4-6 beers daily and liquor on weekends.
- Tobacco - 80 pack year history.
CASE PRESENTATION

- **PE:**
  - 99 138/88 86
  - A/Ox3
  - Neurological: no focal deficits.
  - RRR
  - Clear bilaterally
  - Abdomen - soft, no masses, obese
  - No edema in extremities.
CASE PRESENTATION

- Laboratory values:
  - Wbc – 4.6, hgb -12.6, hct – 35, platlets - 208
  - Electrolytes, LFTs – wnl.
  - PT – 16.6, INR – 1.4, PTT – 34.6

- CT of abdomen & pelvis – no evidence of metastatic disease.
CASE PRESENTATION

OR Details:

- Episode of hypoxemia after induction of anesthesia.
  - Responded to bronchodilators.
- Patient underwent exploratory laparotomy, right hemi-colectomy, and 2-layered hand sewn ileocolonic anastomosis.
- Patient remained intubated after the case and transferred to SICU.
CASE PRESENTATION

- POD #1:
  - Patient was successfully extubated on morning rounds.
  - Placed on nebulizer treatments, thiamine, folate, Ativan for delirium tremens prophylaxis.
  - He remained hemodynamically stable and was out of bed.
CASE PRESENTATION

- Overnight (3:00 a.m.), patient became restless and agitated.
  - 115/75  HR: 95  sat – 100%
- Given IM ativan (4 mg) and haldol (5 mg), soft restraints placed.
- (3:51 a.m.)
  - ABG (face mask): 7.41/40.9/63.3/25.5/92.5/0.0
CASE PRESENTATION

- 4:30 a.m. Patient became unresponsive and asystolic.
- Code 33: Patient was intubated and resuscitated as per ACLS.
- 5:00 a.m (post code). : 7.16/36/119/12.4/99/-15
CASE PRESENTATION

- POD #2:
  - Despite discontinuation of all sedation, patient remained unarousable.
  - Head CT scan showed changes consistent with diffuse anoxic brain injury.
  - No PE on chest CT
  - No EKG changes or significant troponin elevation.
CASE PRESENTATION

- No change in patients neurological status over next several days.
- After consultation with neurology, palliative care, and hospital ethics committee, patient’s condition was discussed with the family.
- POD #7: Patient’s family decided to withdraw supportive care.
ALCOHOL WITHDRAWAL SYNDROME

- Epidemiology:
  - Common condition in inpatient setting.
  - Symptoms developed in 8% of all general hospital admissions, 16% of all postsurgical patients, and 31% of all trauma patients.
  - Development of alcohol withdrawal increased mortality 3 fold in post surgical patients.
Alcohol withdrawal is a neurologic disorder with a continuum of progressively worsening symptoms.

Secondary to effects of chronic alcohol use on the central nervous system.

Exacerbated by the co-morbid conditions associated with alcoholism.
PATHOPHYSIOLOGY

- Chronic alcohol consumption has profound effects on central nervous system neurotransmitters.
- Chronic exposure increases overactivity in CNS – especially sympathetic autonomic outflow
- GABA receptor: “great inhibitor”
  - Alcohol downregulates GABA -R leading to loss of inhibition.
- NMDA receptor:
  - Alcohol upregulates NMDA leading to increased excitation.
- This combination of increased excitation and loss of inhibition results in the clinical manifestations of autonomic excitability and psychomotor agitation.
CLINICAL SYNDROMES

- Minor Withdrawal: 6-36 hours
  - Tremulousness, mild anxiety, headache, diaphoresis, anorexia, GI upset
  - characterized by hypertension, tachycardia
- Alcoholic Hallucinosis: 12-48 hours
  - Visual, auditory, and/or tactile hallucinations
- Withdrawal Seizures: 6-48 hours
  - Generalized, tonic-clonic seizures
  - occur early, usually single with brief post-ictal period
- Delirium Tremens: 48-96 hours
  - Delirium, tachycardia, hypertension, agitation, fever, diaphoresis
  - characterized by delirium and autonomic instability
CLINICAL SYNDROMES

- **Alcoholic Hallucinosis**
  - 25% of patients.
  - Tactile (formication) and visual hallucinations
  - No evidence of autonomic instability
  - Not a predictor for subsequent development of DT.

- **Withdrawal Seizures:**
  - In 10% of patients with alcohol withdrawal
  - Self limited with rapid recovery
  - Status epilepticus (rare)
    - May have underlying seizure disorder
  - Seizure with high alcohol level – poor prognostic indicator.
CLINICAL SYNDROMES

- DELIRIUM TREMENS: 48-96 hours
  - Severe autonomic instability along with:
    - Disturbance of consciousness or
    - Change in cognition (such as memory deficit, disorientation, language disturbance)
  - 5 - 37% mortality.
  - Increased mortality if other co-morbidities: pulmonary disease, liver disease, temperature > 104 F.
RISK FACTORS for DEVELOPMENT OF SEVERE ALCOHOL WITHDRAWAL

- Strongest predictor: history of prior episodes or family history.
- Age >30
- History of sustained drinking.
- Biochemical markers: homocysteine levels, liver function tests, alcohol level
  - Several studies done with contradictory results and no clear correlation.
Clinical Institute Withdrawal Assessment Score – objective scoring system to quantify the severity of alcohol withdrawal.

MANAGEMENT

- Alcohol withdrawal seizures:
  - Self limited
  - Benzodiazepines are the preferred agent and prevent recurrence.
  - Dilantin – multiple trials show does not prevent recurrence. Most likely secondary to its inability to regulate GABA or NMDA receptors.
MANAGEMENT: Severe Alcohol Withdrawal

- Autonomic instability could place significant physiological stress.
- ABC
- All patients with chronic alcohol use have vitamin (especially Thiamine) and volume depletion.
- DVT prophylaxis and aspiration precautions.
- Correct electrolyte deficiency.
MANAGEMENT
Drug of Choice

- Landmark study: randomized prospective study.
- 547 patients in acute alcohol withdrawal were randomized to 1 of 4 drugs or placebo.
  - Chlordiazepoxide
  - Chlorpromazine
  - Hydroxyzine
  - Thiamine
- Patients receiving chlordiazepoxide had the lowest incidence of both delirium tremens and alcohol withdrawal seizures.

- BENZODIAZEPINES - first-line agent for treatment of Alcohol Withdrawal Syndrome.

MANAGEMENT
Drug of Choice

- Diazepam (valium):
  - Prefered agent for moderate to severe AWS
  - Rapid onset of action (avoids oversedation)
  - Long half-life secondary to active metabolite

- Chlordiazepoxide (librium): most commonly used

- Lorazepam (ativan)
  - No active metabolites, better tolerated in patients with compromised liver function
MANAGEMENT
Drug of Choice

- Phenobarbital and propofol are other options that can be given in addition to benzodiazepines.
- Beta-blockers and central acting alpha-agonists (clonidine) as adjuncts.
Severe alcohol withdrawal / delirium tremens.

Initial management: titration with intravenous benzodiazepine to achieve sedation and normal vital signs.

May need admission to ICU or stepdown unit – for autonomic instability / respiratory depression

Repeated reassessment and administration of boluses in a symptom-triggered fashion.
SUGGESTED CRITERIA for ICU ADMISSION

- Age >40
- Cardiac disease
- Hemodynamic instability
- Marked acid-base disturbances
- Severe electrolyte defects
- Respiratory insufficiency
- Potentially serious infections (wounds, pneumonia, trauma, urinary tract infection)
- Signs of gastrointestinal pathology (pancreatitis, GI bleeding, hepatic insufficiency, suspected peritonitis)
- Persistent hyperthermia (T >39°C [103°F])
- Renal insufficiency or increased fluid requirements
- A history of prior alcohol withdrawal complications
- Need for frequent or high doses of sedatives or an intravenous infusion to control symptoms

MANAGEMENT: Symptom-triggered

- Randomized, double-blind study:
  - 101 patients randomized to either fixed (with boluses as required) or symptom triggered regiment.

- Severity of symptoms quantified by using Clinical Institute Withdrawal Assessment score.

MANAGEMENT: Symptom-triggered

- Results:
  - Shorter duration of treatment.
  - Decreased amount of benzodiazepine used.
  - No significant differences in the severity of withdrawal during treatment.
  - No difference in the incidence of seizures or delirium tremens between two groups.

CONCLUSIONS

- Alcohol withdrawal is a complex neurological disorder.
- Physiologic process involving both neuronal excitation and reduced inhibition leading to autonomic excitability that can lead to altered mental status and seizures.
- Treatment includes supportive care and sedation with benzodiazepines in a symptom triggered fashion.