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Objectives

• 1) Explain the pathophysiology of Alcohol Withdrawal Syndrome • 2) Describe signs and symptoms of patients in Alcohol Withdrawal Syndrome ④3) Identify nursing interventions and supportive therapies that are associated with the patient experiencing Alcohol Withdrawal Syndrome

 50% of adults in westernized countries are classified as alcohol consumers
 Pleasurable safe experience with minimal health risk

May 2013 American Psychiatric Association updated **Diagnostic and** Statistical Manual of **Mental Disorders** Combined alcohol abuse and alcohol dependency into a single disorder

 Meet 2 of 11 criteria during the same 12 month period = diagnosis of AUD
 Mild

- Moderate
- Severe

Mild: The presence of 2 to 3 symptoms

Moderate: The presence of 4 to 5 symptoms

Severe: The presence of 6 or more symptoms

there?

- I0-33% admissions to intensive care units have Alcohol Use Disorder
- Increase mechanical ventilation by 49%
- Morbidity and Mortality rates 2-4 times higher in chronic alcoholics
 - Bleeding disorders
 - Infections
 - Cardiopulmonary insufficiency

1955 Experiment

• 7-34 days minor withdrawal symptoms 48-87 days major withdrawal Most people are vulnerable to the effects of abrupt cessation

Complications

Cardiac

- Arrhythmias
- Cardiomyopathy
- Neurological
 - Wernicke's encephalopathy
 - Altered mental status
- Respiratory
 - Pneumonia
 - ARDS
- Gastrointestinal
 - Bleeding
 - Varices
 - Pancreatitis
 - Liver failure
- Metabolic and renal
 - Hypoglycemia
 - Acute renal failure

Wernicke's Encephalopathy

Wernicke's is caused by a deficiency in the B vitamin thiamine. Thiamine plays a role in metabolizing glucose to produce energy for the brain. An absence of thiamine, therefore results in an inadequate supply of energy to the brain

Wernicke's Encephalopathy

Encephalopathy

- Profound disorientation
- Indifference
- Inattentiveness
- Oculomotor dysfunction
 - Nystagmus
 - Conjugate gaze palsies
- Gait ataxia
 - Wide based gait

Treatment

Intravenous thiamine

Alcohol Withdrawal Syndrome

 Alcohol withdrawal commonly encountered in inpatient setting

 8% of all hospitalized patients
 16% postsurgical patients
 31% trauma patients

 3-5 % will experience delirium tremens

Alcohol is absorbed through the stomach wall and enters the blood stream in about 7 minutes Alcohol is central nervous system depressant Metabolized in liver

Upregulation: An increase in the number of receptors on the surface of target cells, making the cells more sensitive to a hormone or another agent



Downregulation: A decrease in the number of receptors on the surface of target cells, making the cells less sensitive to a hormone or another agent



 Alcohol enhances neurotransmission at the A receptors of gammaaminobutyric acid (GABA).

> Primary inhibitory neurotransmitter

Inhibits N-methyl-daspirtate (NMDA) and non-NMDA glutamate receptors

> Primary excitatory neurotransmitter

Initially this causes decreased brain excitability
 After prolonged use adaptation occurs
 Fewer GABA receptors (inhibitory neurotransmitter) downregulation
 Increased glutamate receptors (excitatory) upregulation
 Occurs as brain tries to maintain homeostasis in

the presence of persistent drug use

 These responses lead to increased tolerance
 Need higher blood alcohol concentration to maintain the same intoxicating effects
 Brain overcompensates to maintain homeostasis (increased excitatory neurotransmitters)

The adaptation that has occurred results in increased excitatory activity, which leads to symptoms called alcohol withdrawal syndrome.

Symptoms of alcohol withdrawal correlate with the amount and duration of alcohol consumed.

Alcohol Withdrawal Syndrome

Mortality rate 2-10 % down from 35 %

- Arrythmias
- Fluid depletion
- Electrolyte imbalance
 - Hypokalemia, hypomagnesium, hypophosphotemia
- Pneumonia
- Fat emboli
- Older age
- Core temperature of 104* F
- Coexisting liver disease

Criteria For Alcohol Withdrawal Syndrome

- Diagnostic and Statistical Manual of Mental Disorders 5
 - 1) cessation of (or reduction in) alcohol use that has been heavy and prolonged
 - 2) two or more of the following symptoms developing in several hours to a few day after cessation

Criteria for Alcohol Withdrawal Syndrome

- Autonomic hyperactivity
- Increased hand tremors
- Insomnia
- Nausea or vomiting
- Hallucinations
- Psychomotor agitation
- Anxiety
- Generalized tonic-clonic seizures

Phases of Alcohol Withdrawal

Divided into 4 phases
Autonomic hyperactivity
Hallucinations
Seizures
Delirium tremens

Phase 1 Autonomic Hyperactivity

6-12 Hours (peak 24-48 hours) Insomnia Tremulousness Mild anxiety Gastrointestinal upset Headache **Palpations** Sweating

Phase II Hallucinations

12-24 Hours

- Hallucinations (Alcohol Hallucinosis)
 (Rum Fits)
 Persecutory
 Visual
 - Clear sensorium

Phase III Seizures

24-48 Hours Generalized tonicclonic seizure Usually one If more need to investigate Increased chance of seizures dependent upon number of withdrawal episodes 1st admission -10% > 5 admissions – 42%

Phase IV Delirium Tremens

48-72 Hours

- Alcohol withdrawal delirium (DT)
 - Disorientation
 - Hallucinations (visual)
 - Hypertension
 - Tachycardia
 - Agitation
 - Sweating

Phases of Alcohol Withdrawal Syndrome

 Typically lasts for 5-7 days
 Can last up to 2 weeks

Delirium Tremens

Increased length of stay in the ICU Increased length of stay in hospital Increased costs due to increased medical treatment Confused with other problems Sepsis Worsening closed head trauma Delirium

Treatment for Alcohol Withdrawal

Medication that is cross tolerant with alcohol
 Rapid onset
 Long half life

Side effects
Confusion
Decreased level of consciousness
Respiratory depression

First-line therapy

- Reduce signs and symptoms of withdrawal
- Significant reduction in seizures and delirium

 Benzodiazepines enhance the effects of the neurotransmitter gamma aminobutyric acid which results in sedative, hypnotic, anxiolytic, anticonvulsant, muscle relaxant and amnesic

No particular agent proven better than others
 Often prefer agents with fast onset in acute setting

diazepam

lorazepam (preferred in hepatic dysfunction)

Oxazepam(Serax), chlordiazepoxide (Librium) and alprazolam (Xanax) also found to be effective

Patients with severe withdrawal may require very large doses of benzodiazepines

- Excessive sedation, increased rates of intubation
- Some patients not controlled even at high doses (reports of >1000mg)

Benzodiazepines Benzodiazepine resistant alcohol withdrawal syndrome GABA receptors saturated no further improvement in symptoms No standard definition Doses > 40 mg of diazepam (or equivalent) benzodiazepine) in one hour Doses > 50 mg diazepam or 10 mg lorazepam within first hour Doses > 200 mg diazepam or 40 mg lorazepam within three hours

Diazepam (Valium) Longer ½ life Multiple metabolites Metabolized in the liver Propylene glycol diluent Lorazepam (Ativan) No active metabolites Preferred in liver disease

Many alternatives and adjunctive therapies have been studied

Anticonvulsants

- phenobarbital
- carbamazepine, oxcarbamazepine
- valproic acid
- phenytoin
- topiramate
- tiagabine
- GABA receptor agonists/antagonists
 - gabapentin
 - GHB
 - flumazenil
 - baclofen
 - propofol
 - phenobarbital

- Antipsychotics
 - olanzapine
 - promazine
 - chlorpromazine
 - haloperidol
- Beta blockers
 - atenolol
 - propranolol
- clonidine
 - PO and transdermal
- ethanol
 - IV and PO
- magnesium
- Dexmedetomidine
- Ketamine

Benzodiazepine Resistant Alcohol Withdrawal Ideal management of benzodiazepine resistant alcohol withdrawal remains

unclear

Phenobarbital

 Binds GABA A receptor at separate site from GABA to enhance binding and potentiate inhibitory tone

- Synergistic effects with benzodiazepines in patients considered refractory
- The most effective dosing strategy still needs to be clarified

Propofol

- Block NMDA receptors to reduce excitatory tone Provides sedative, anxiolytic, anticonvulsant, amnestic and antiemetic properties Adverse effects: hypotension and respiratory depression
- Intubation

Dexmedetomidine Precedex

Dexmedetomidine specific/potent alpha-2 receptor agonist Decrease sympathetic-mediated symptoms: tachycardia, hypertension, and anxiety Anxiolytic, analgesic, and sedative No significant respiratory depression Adverse effects: bradycardia and hypotension

Dexmedetomidine Precedex

Loading dose: 0.25 - 1 mcg/kg over 10 minutes.

Bradycardia, Hypertension, Hypotension
 Maintenance: 0.2 – 1.5 mcg/kg/HR

Precedex

Dexmedetomidine (Precedex) has been thus far ONLY been approved by the FDA for use in short-term sedation of intensive care patients

Ketamine

 NMDA receptor antagonist
 Oppose excitatory signal leading to reduced benzodiazepine requirement
 Further study needed

Fixed Schedule Therapy

 Medication given at a fixed interval (front loading)
 Helps to prevent at risk patient from going into withdrawal

Symptom Triggered Therapy

 Medications administered in response to signs and symptoms of alcohol withdrawal
 Less risk of over sedation or under treatment
 Less medication administered

Shorter treatment time

Withdrawal Scales

 Total Severity Assessment and Selected Severity Assessment (Gross et al. 1973),
 Abstinence Symptom Evaluation Scale (Knott et al. 1981)
 Clinical Institute Withdrawal Assessment

Scale [CIWA] (Shaw et al. 1981)

Clinical Institute Withdrawal Assessment of Alcohol (CIWA-A or CIWA-Ar)

- Rapid symptom severity assessment using 10 item scale
- An objective guide for medication administration
 Medication typically withheld until score ≥ 10
 - Protocols may vary by institution

Sullivan et al. British Journal of Addiction 1989;84 Shaw et al. Journal of Clinical Psychopharmacology 1981 McKeon et al. J Neurol Neurosurg Psychiatry 2008;79 Kosten et al. NEJM 2003;348

Appendix. Clinical Institute Withdrawal Assessment for Alcohol.*						
Category	Range of Scores	Examples				
Agitation	0–7	0=normal activity 7=constantly thrashes about				
Anxiety	0–7	0 =no anxiety, at ease 7 =acute panic states				
Auditory disturbances	0–7	0=not present 7=continuous hallucinations				
Clouding of sensorium	0—4	0=oriented, can do serial additions 4=disoriented as to place, person, or both				
Headache	0–7	0=not present 7=extremely severe				
Nausea or vomiting	0–7	0=no nausea, no vomiting 7=constant nausea, frequent dry heaves and vomiting				
Paroxysmal sweats	0–7	0=no sweat visible 7=drenching sweats				
Tactile disturbances	0–7	0=none 7=continuous hallucinations				
Tremor	0–7	0=no tremor 7=severe, even with arms not extended				
Visual disturbances	0–7	0=not present 7=continuous hallucinations				

* The Clinical Institute Withdrawal Assessment for Alcohol measures 10 categories of symptoms, with a range of scores in each. The maximal score is 67. Minimal-to-mild withdrawal symptoms result in a total score below 8; moderate withdrawal symptoms (marked autonomic arousal), in a total score of 8 to 15; and severe withdrawal symptoms, in a total score of more than 15. High scores are predictive of seizures and delirium.

CIWA-Ar

67 point scale

 Minimal to mild withdrawal < 8
 Moderate 8-15
 Severe > 15

 High scores predictive of seizures and delirium

Give medication until score < 10</p>

CIWA-Ar

Patient awake
Able to answer question
Not confused
Not intubated

Nursing Care

- Calm quite environment
- Orient / reorient to environment
- Nutrition / hydration / elimination
- Patent IV access
- Level of consciousness
- Monitor heart rate, blood pressure, respiratory rate, 02 sats

Restraints



Nursing Care

Reposition as needed Assess for skin breakdown Elevate head of bed Frequent checks Replace electrolytes Monitor labs Seizure precautions

Questionnaires To Detect **Alcohol Use Disorder** CAGE 4 questions Reliable, valid, and practical •77% specificity and sensitivity of 91% for identifying AUD More than 2 positive responses strongly suggest alcohol dependence FAST TWEAK

CAGE

1. Have you ever felt you should cut down on your drinking?

- Yes
- No
- 2. Have people annoyed you by criticizing your drinking?
 - Yes
 - No
- 3. Have you ever felt bad or guilty about your drinking?
 - Yes
 - No
- 4. Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (*eye*-opener)?
 - Yes
 - No

2100

- 47 year old male history of alcohol use
- Transferred from outside hospital where he was being treated for alcohol withdrawal
- Over past 24-36 hours mental status worsened, increased confusion and agitation
- Last drink 3 -10 days ago
- A-fib esmolol started
- Thiamine 100mg IV given
- Mag. 1.6
- Phos 2.4
- K 4.2

Placed on seizure precautions and CIWA-ar protocol

12/1

Received > 300 mg valium in less than 24 hours Hallucinating about a one inch man running around the room Disoriented to time and place Agitated, pulling out IV access, crawling out of bed (restrained)

	12/1/09							
	0900	1000	1030	1200	1600	2001		
	CIWA Scale							
Nausea/vomiting	0	0	0	0	0			
Tremor	7	6	4	2	7			
Sweats	6	4	4	3	4			
Anxiety	7	5	4	2	6			
Agitation	7	6	4	2	6			
Tactile Disturbance	6	4	3	0	4			
Auditory Disturbances	4	4	3	0	3			
Visual Disturbances	7	4	0	0	4			
Headache	0	0	0	0	0			
Orientation	4	4	4	4	4			
CIWA Score	48	37	26	13	38			

12/2

Received > 300 mg intravenous valium
 Dexmedetomidine started and titrated to 1.2 mcg/kg/hr for 24 hours.
 Continued on Ciwa-ar protocol
 Received 40 mg of valium while on dexmedetomidine

12/3

Dexmedetomidine stopped Esmolol stopped and placed on oral Betablocker Patient was transferred out of unit Continued on CIWA-ar scale Evaluated by Chemical Dependency Discharged home on 12/4 Treatment to start on 12/5

Questions ?

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