

# *Pharmacological Aspects of addiction*



- Alcohol Related Disorders

# Alcohol Related Disorders



Alcohol Use  
Disorder

Alcohol Induced  
Disorder

# Alcohol Use Disorders



Alcohol  
Abuse

Alcohol  
Dependence

# *Conceptualization*

*and*

# *Models of Alcoholism*

- Ethical
- Learned Behavior
- Socio-cultural
- Genetic
- Psychodynamic
- Tension-Relief
- Medical

# *Alcohol Related Problems*



- 85% of all U.S. residents have had an alcohol containing drink in their life time.
- 51% of all U.S. adults are current users of Alcohol.
- Alcohol Related Disorders are 3rd largest health problem in the U.S..
- 35% to 45% of all adults in the U.S. has one transient alcohol related problem.

# *Alcohol Related Problems*



- 200,000 deaths each year are directly related to alcohol Related disorders.
- 50% of all homicide, 25% of all suicide involve alcohol.

# *Pharmacological Features*



- Chemical Formula:  $\text{CH}_3\text{-CH}_2\text{-OH}$   
Ethyl Alcohol (Ethanol)
- One drink increase blood level 15 to 20mg/dl.
- The amount an average person can metabolize (process) in one hour is about 15mg/dl.

# *Pharmacological Features*



- One drink is equal to:
  - 12 oz of Beer (= 4%)
  - 4 oz of Wine (= 10%)
  - 1.5 oz of Whiskey (= 40%).

# *Absorption*

- 10% from stomach.
- Mostly from small intestine.
- Peak effect in 30 to 90 minutes and it depends upon:
  - > time of food intake.
  - > duration of consumption.
  - > type of drink consumed.

# Pharmacological Features



- Metabolism (how alcohol is processed in body):
  - 90% - processed in liver.
  - 10% - excreted (eliminated) unchanged from kidneys and lungs



# *Pharmacological and Neurobiological Aspects*

- G A B A<sub>A</sub> Receptors - alcohol potentiates inhibitory effects of G A B A.
- N M D A Glutamate Receptors -  
Alcohol inhibits excitatory amino acid receptors.

# Pharmacological Features

## *Effects on Body*



- **Respiratory System (breathing)**
- **Brain**
- **Cardiovascular (heart)**
- **Stomach**

# *Alcohol Withdrawal*



Sudden stop or decrease in use of alcohol after prolong use

- Increasing Age
- Presence of other medical illness
- Other factors

## *What happens?*

- Restlessness, agitation
- Sweating and flushed face
- Tremors
- Increased in blood pressure and heart rate
- Hallucination
- Seizers (convulsions)

# *Alcohol Withdrawal Treatment*

## **General Approach**

- Medical Emergency when severe

Needs hospitalization

- if mild, can be treated on outpatient basis

# *Alcohol Withdrawal Treatment*



Safe Detoxification

Medication Used:

- Benzodizapines
- Barbiturates
- Carbamezapine

# *Alcohol Withdrawal Treatment*

## Supportive Measures:

- Fluid Replacement
- Multivitamin Supplement
- Quiet Environment
- Seclusion if necessary
- High Calories
- High carbohydrate diet

# *Alcohol Induced Disorders*



- Memory problems (Wernicke-Korsakoff Syndrome)
- alcohol induced mood disorder
- alcohol induced anxiety disorder
- Fetal Alcohol syndrome (effects on unborn baby)

# *Fetal Alcohol Syndrome*



- Exposure of fetuses to alcohol when their mothers drink alcohol.
- Leading cause of mental retardation in the U.S..
- Other features include:
  - Microcephaly (small head)
  - craniofacial malformation
  - limb and heart defects

# *Treatment for Alcohol Use Disorders*



- psychotherapy
- family therapy
- alcoholics anonymous (AA)
- AL-Anon (for spouse and family)
- residential facilities and half-way houses
- pharmacotherapy

# *Pharmacological Treatment of Alcohol Related Disorders*



•

• Disulfiram

• Naltrexone

• Acamprosate

• Antidepressants

fluoxetine (Prozac)

citalopram (Celexa)

others

# *Disulfiram (Antabuse)*



Acts by increasing a toxic product of alcohol in the body

- Aversive method

# *Disulfiram (Antabuse)*

## *(continued)*



- disulfiram in the presence of alcohol can lead to:
  - hypotension, flushing, headache
  - nausea, vomiting
  - dizziness, palpitation
  - difficulty in breathing
  - fainting, convulsions


# *Disulfiram (Antabuse)*

*(continued)*



- given in 125 to 500 mg doses per day
- patient needs to be abstinent from alcohol for at least 24 hours-
- use of alcohol within two weeks of the last disulfiram dose can cause a severe reaction

# *Naltrexone*

- 
- opioid antagonist
  - decreases craving
  - blocks euphoric effects of opioids
  - can be taken as daily doses or 3 times per week
  - no abuse potential
  - very safe when used in usual dosage range

# *Side Effects*



- mostly abdominal complaints
- some effect on liver function
- cause increase in liver enzymes
- dysphoria


# *Acamprosate*

(continued)



- should not be given to individuals with kidney problems
- given as multiple daily doses

# *Antidepressants*

- 
- generally better results in patients with comorbid depression
  - better response in late onset, low severity alcoholism

# *Commonly used Antidepressants*



- fluoxetine (Prozac)
- sertraline (Zoloft)
- paroxetine (Paxil)