

• Adverse Drug Reaction

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- Objectives
 - Explain Pharmacovigilance & various types of adverse drug reactions.
 - List some common adverse effects & toxicities with examples.
 - Discuss drug dependence & its public health importance.
 - Describe principles of toxicology & treatment of poisoning in general.
 - Describe Idiosyncratic reactions.
- Pharmacovigilance
 - Science of collecting, monitoring, researching, assessing and evaluating information from health

care providers and patients on adverse effects of medications

- Adverse drug reaction (ADR) (WHO)
- Response to a drug that is noxious & unintended
- Occurs at doses normally used in man
- For prophylaxis, diagnosis or therapy of disease or for modification of physiological functions
- Should require an intervention
 - ✓ Warning, Dose adjustment, Stoppage of therapy, Intervention for treatment of ADRs
- Side Effects
- Undesirable effects which may accompany beneficial effects of drug
- Not so harmful as to stop drug
- e.g.
 - ✓ Dryness of mouth with atropine
 - ✓ Tachycardia with ephedrine

- Toxicity
- Exaggeration of desired therapeutic effect at higher doses
- Dose related
 - ✓ Coma due to barbiturates
 - ✓ Delirium, hyperpyrexia in atropine overdose
- Adverse drug reaction: Classification
- Types
 - ✓ Type A: Augmented
 - ✓ Type B: Bizarre
 - ✓ Type C: Chronic
 - ✓ Type D: Delayed
 - ✓ Type E: End of dose
 - ✓ Type F: Failure of therapy
- Type A: Augmented
- Dose related, Predictable & expected
- Less mortality, High frequency
- Incidence more in elderly, infants, renal & hepatic dysfunction
 - ✓ Gastritis with NSAIDs
 - ✓ Tachyarrhythmias with adrenaline

- Type B: Bizarre
- Not expected from known pharmacological action of drug in usual doses
- Unpredictable, Based on patient rather than drug
- Occur on 1st exposure, High mortality, Less frequency
 - ✓ Hemolysis in G-6-PD deficient individuals: Primaquine, Dapsone
 - ✓ Prolonged apnea with SCh

- Type C: Chronic
- Dose & time related
- Uncommon
- Related to cumulative dose
- Drug given for prolonged period of time
- e.g.
 - ✓ SLE with Hydralazine

- ✓ HPA suppression with Corticosteroids
- Type D: Delayed
- Time related
- Uncommon
- Apparent sometimes after stoppage of drug
- e.g.
 - ✓ Vaginal adenocarcinoma with DES
 - ✓ Tardive dyskinesia with CPZ

- Type E: End of Dose
- Uncommon
- Occur after withdrawal of therapy
- e.g.
 - ✓ Acute adrenal insufficiency on stoppage of corticosteroids
- Type F: Failure of therapy
- Common
- Dose related
- Often caused by drug interactions
- e.g.

✓ Oral contraceptive failure with Rifampicin

- Drug Dependence
- Drug dependence is a state in which use of drugs for personal satisfaction is accorded a higher priority than other basic needs

1. Psychological dependence

- When individual believes that optimal state of wellbeing is achieved only through actions of drug
- May start as liking for drug effects & may progress to compulsive drug use in some individuals
- E.g: opioids, cocaine

2. Physical dependence

- An altered physiological state
- Produced by repeated administration of a drug

- Need for presence of drug to maintain physiological equilibrium
- Discontinuation of drug results in a characteristic withdrawal (abstinence) syndrome
- E.g : Alcohol

3. Drug abuse

- Refers to use of a drug by self medication
- Not approved by medical and social patterns
- Cocaine

4. Drug addiction

- Pattern of compulsive drug use characterized by overwhelming involvement with the use of a drug
- E.g. Amphetamines, cocaine, cannabis,

Toxicology

- Definitions
- Toxicology
 - ✓ Science deals with poison with reference to
 - Source, properties, mode of action
 - Symptoms, lethal dose, treatment
- Poison
 - ✓ Substance which when administered, inhaled/ ingested, capable of acting deleteriously on human body
- Initial management of toxicity

- Airway
- Breathing
- Circulation
- History

- Physical Examination
 - ✓ Vital signs
 - ✓ Eyes
 - ✓ Mouth
 - ✓ Skin
 - ✓ Abdomen
 - ✓ Nervous system
- Initial management of toxicity
- Laboratory reports
 - ✓ Arterial blood gases
 - ✓ Electrolytes
 - ✓ Renal function test
 - ✓ Echocardiogram
- Decontamination
- Skin
- Gastrointestinal tract
 - ✓ Emesis
 - ✓ Gastric lavage

✓ Activated charcoal

- Specific Antidote
- Idiosyncratic Reactions
- Genetically determined abnormal response of a drug
- Unique feature of individual, not found in majority of subjects.
- Eg.
 - Barbiturates causes excitement and mental confusion in some subjects.