NO Date 5th lec: Pharmacodynamics III

-Quantal dose-response relationships

the influence of the magnitude of the dose on the proportion of a population that responds

-the desired response is:-

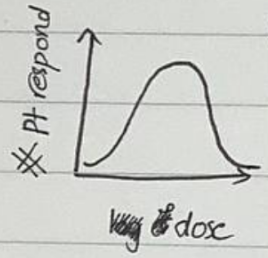
1. Specified in amount or magnitude

positive response : record responce ≥ amount

negative response :..

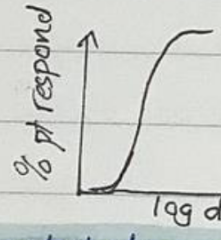
2. All or none response

eg: death, prevent epileptic seizures, prevent cardiac arrhythmias

- 

Frequency distribution

gaussian normal curve of variation

- 

cumlative frequency distribution

- quantal dose-effect curve is characterized by

ED50	TD50	LD50
median effective dose	median toxic dose	median lethal dose

- Important jargon:-

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- **Summation :-** two drugs similar mechanisim are given togther they produce additive effects.
- **Potentiation / synergism :-** two drugs exceed sum of their individual effects ,act at different receptors or effector systems.
to treat AIDS : AZT + proteese inhibitor
- ***Prediction of drug safety :-** obtained by Therapeutic Index TI

- **TI :-** ratio of dose that produces toxicity to the dose that produces a clinically desired or effective response in a population of individuals

$$TI = \frac{TD_{50}}{ED_{50}}$$, the higher of TI magnitude is better

- **Therapeutic window :-** the concentration range over which a drug produces its therapeutic effect
- theraputic index ↓ → narrow theraputic window → effective + toxic R overlap → bioavailability alter theraputic effect
- theraputic index ↑ → wide therapubic window → safe → bioavailability does not alter therapeutic effect
- **Specificity :-** drug has 1 effect and only 1effect on all biological systems.
- **Selectivity :-** drug act on more than 1 receptor site once they reach an appropriately high [ ],

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* ADVERSE Effects of Drugs — Unwanted / harmful effects

predictable dose related type A

→ Side effects

→ Toxic effects
- functional
- structural

Unpredictable Type B

→ Allergy
1. Immediate type
IgE ∠ mast cell / basophils
2. Cyto-toxic reaction
Igg, IgM → tissue damage
3. Immune complex mediate
e.g: Serum sickness
4. Delayed cell mediated
activate T lymphocyte...

→ Idiosyncrasy
abnormal drug reaction ; genetic factors affect tissue / enzymes / receptor like → Hemolysis
by sulfonamides
antimalarial primoquin
→ Resistance to Vitamin D
oral anti-coagulant warfarin

* more susceptible to adverse effects
- foetus
- elderly
- polypharmacy
- pre-exist disease
- genetic defect

Special toxicity

→ Genotoxicity
→ Mutagenicity
alkylating agents

→ Teratogenicity in pregnancy

→ Carcinogenicity
may take for 2 years

→ Reproductive Toxicity
↓ pregnancy rate
...

Others

→ Delayed Toxicity
"chloramphenicol"
→ anemia
→ chronic toxicity
long term steriods (cushing)
Dependence
CNS depressants
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Adverse effects causing :-

① Over extension of same mechanism of action in same tissue

anti_coagulants

② Effect on same receptor type but in another tissue

anti_muscarinic

③ Effect on different receptor / different mechanism