

Pharmacodynamics. We exactly know what pharmacodynamics is. It involves how the drugs act on target cells to alter cellular function. Let us discuss Dose Response relationship in this article. The exact relationship between the dose and the response depends on the biological object under observation and the drug employed is called Dose Response relationship.

Dose Response relationship

When a logarithm of dose as abscissa and responses as ordinate are constructed graphically, the “S” shaped or sigmoid type curve is obtained. The lowest concentration of a drug that elicits a response is minimal dose, and the largest concentration after which further increase in concentration will not change the response is the maximal dose.

1. Graded dose effect:

As the dose administered to a single subject or tissue increases, the pharmacological response also increases in graded fashion up to ceiling effect.

- It is used for characterization of the action of drugs. The concentration that is required to produce 50 % of the maximum effect is termed as EC50 or ED50.

2. Quantal dose effect:

It is all or none response, the sensitive objects give response to small doses of a drug while some will be resistant and need very large doses. The quantal dose effect curve is often characterized by stating the median effective dose and the median lethal dose.

Median lethal dose or LD50:

This is the dose (mg/kg), which would be expected to kill one half of a population of the same species and strain.

Median effective dose or ED50:

This is the dose (mg/kg), which produces a desired response in 50 per cent of test population.

Therapeutic index:

It is an approximate assessment of the safety of the drug. It is the ratio of the median lethal dose and the median effective dose. Also called as therapeutic window or safety. Therapeutic index (T. I) = The larger the therapeutic index, the safer is the drug.

Penicillin has a very high therapeutic index, while it is much smaller for the digitalis preparation.

D. Structural activity relationship
The activity of a drug is intimately related to its chemical structure. Knowledge about the chemical structure of a drug is useful for:
(i) Synthesis of new compounds with more specific actions and fewer adverse reactions
(ii) Synthesis of competitive antagonist and
(iii) Understanding the mechanism of drug action.
Slight modification of structure of the compound can change the effect completely.

These are few very important terms you need to understand in pharmacodynamics.



