Metoprolol

Class: Antihypertensive Agent, Beta-Blocker, $Beta_1$ Selective

Pharmacokinetics

Absorption

i.) Non-genetic
- a. Formulation used (bioavailability immediate (50%) vs. sustained-release (65-70%) tablets)
- b. Food: increased absorption (increased serum levels)
- c. Concomitant medication
  - i. Hydralazine may decrease metoprolol bioavailability
  - ii. Oral contraceptives may increase metoprolol area under the curve and max concentration
  - iii. Verapamil may increase metoprolol bioavailability

ii.) Genetic
- a. No clear genetic factors affecting absorption

Distribution

i.) Non-genetic
- a. No clear non-genetic factors affecting distribution

ii.) Genetic
- a. No clear genetic factors affecting distribution

Metabolism

i.) Non-genetic
- a. Concomitant medications/substances: CYP2D6 inducers or inhibitors
- b. Pregnancy: increased metabolism

ii.) Genetic
- a. Genetic variation in drug metabolizing enzyme gene: CYP2D6

Excretion

i.) Non-genetic
- a. No clear non-genetic factors affecting excretion

ii.) Genetic
- a. No clear genetic factors affecting excretion

Pharmacodynamics

Receptors

i.) Non-genetic
- a. Concomitant medications/substances: beta-adrenergic receptor agonists or antagonists (may block or enhance effects of metoprolol)

ii.) Genetic
- a. Genetic variation in $beta_1$ adrenergic receptor gene
- b. Genetic variation in Gs protein alpha-subunit gene

Transporters

i.) Non-genetic
- a. No clear non-genetic factors affecting transporters

ii.) Genetic
- a. No clear genetic factors affecting transporters