Spring 2003

PHA 5128

Case Study 1

1. A drug has a total body clearance of 45 mL/min and a volume of distribution of 35 L. It is completely absorbed. The therapeutic range is 10-20 μg/ml. Make a dosing recommendation for chronic use.

2. A patient (m, 37y, 74 kg) with a subtherapeutic theophylline (5 μg/mL) is admitted to the ICU. Based on average pharmacokinetics parameters (Vd = 0.5 L/kg, $t_{1/2}$ = 8 h)), calculated an i.v. bolus loading dose and a maintenance dose (i.v. infusion) to increase the level to 15 μg/mL.

3. Show the effect of changes in protein binding on the AUC of any drug given orally. Assume that the drug undergoes first pass metabolism.

4. Calculate the extraction ratio of phenybutazone in a 70 kg patient, given the following information: liver blood flow, 1500 ml/min; half-life, 50 h; Vd, 0.1 l/kg; no non-hepatic elimination.

5. An 80 kg patient receives 500 mg theophylline i.v. by bolus injection every 6 hr. Assume that Vd = 0.5 L/kg and $t_{1/2}$ = 6.4 h. Predict steady state peak and trough concentration.

6. Propranolol, a high-extraction drug, is combined with phenobarbital. What is your expectation for a potential change in propranolol half-life (show evidence).