(THIS SUMMARY IS DESIGNED ONLY FOR THE LECTURE; IT IS NEVER FOR ANY EXAM.)

Clinical Pharmacokinetic for cyclosporine:

A-Initial dose determination.

B-Use of cyclosporine concentration to change the dose.

Initial dose determination:

1-Pharmacokinetic dosing methods.

2- Literature-based methods.

1-Pharmacokinetic dosing methods

To determine the dose in pharmacokinetic methods we need to know:

1- Clearance estimate (Adult patient= (6) ml/min/kg) ….

Pediatric patients (<16 year) = (10) ml/min/kg) …..

Note: multiply by (60/`1000) to get CL in L/hr

2-Appropriate pharmacokinetic model and equations

Notes:

ng/ml =µg/L…

F= 0.3

ʈ =12 hr

$$D(oral) = \frac{Css \times Cl \times \text{ʈ}(12h)}{F\ (0.3)}$$

Divide by 1000 to get the dose in mg when Css in µg/L

$$D\ (I.V\ bolus) = Css \times Cl \times \text{ʈ}\ (12hr)$$

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$$\text{infusion rate} = Css \times Cl$$

2-Literature-based methods.

Generally, the dose is 8-18 mg/kg/day orally, and 3-6 mg/kg/day as I.V..

Notes:

1-Try to choose the middle value.

2-In renal transplantation, choose the lower end of the range.

B-Use of cyclosporine concentration to change the dose

1-Linear Pharmacokinetics Method

2-Pharmacokinetic parameter method

1-Linear Pharmacokinetics Method

D new = (Css,new/Css,old) D old

Or

2-Pharmacokinetic parameter method

$$CL = \frac{(F \times (\frac{D}{\tau})}{Css(old)}$$

× 1000 to get CL in L/hr

Then, calculate D as above (Pharmacokinetic dosing methods)

$$D(oral) = \frac{Css(new) \times Cl \times \tau(12h)}{F\ (0.3)}$$

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