Graphical Estimation of Noncompartmental Pharmacokinetic Parameters: Two compartment system

Ramesh Jayaraman, DoseQuantics Consulting

Infected rats were administered 30 mg/kg Ciprofloxacin intravenously (bolus). The mean concentration time-data are shown in table 1, PK profile in figure 1, and graphical estimates based on a 2 compartment model in figure 2.

Table 1: Plasma concentration-time data of Ciprofloxacin in rats (30 mg/kg, IV)

Time [h]-	Mean conc [µg/ml]	Extrapolated conc from beta phase [µg/ml]	Residual concentration, alpha phase [µg/ml]
0.033	22.800	4.9	17.900
0.25	14.943	4.6	10.343
0.5	6.710	4.2	2.510
1	3.740	-	-
2	2.703	-	-
4	1.520	-	-
8	0.543	-	--
24	0.016	-	-

Fig 1: IVPK of Ciprofloxacin in rat: 30 mg/kg

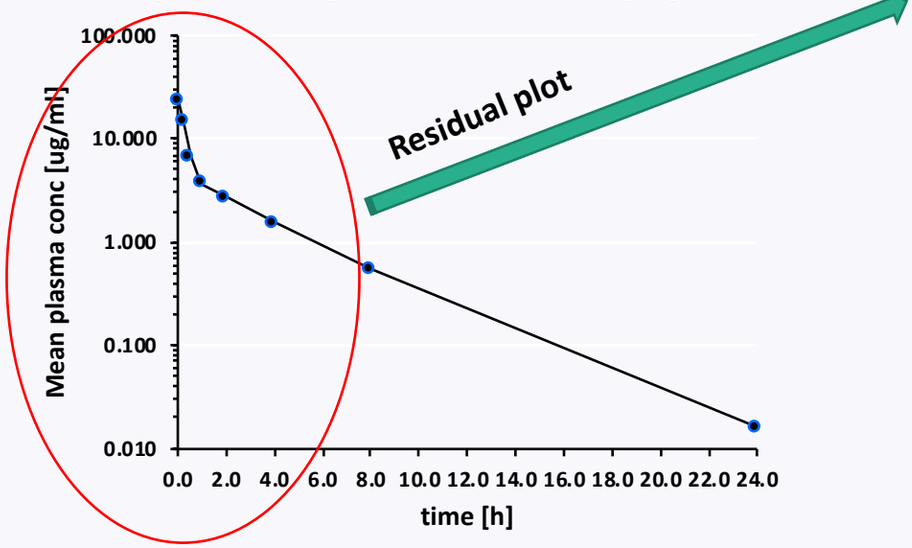
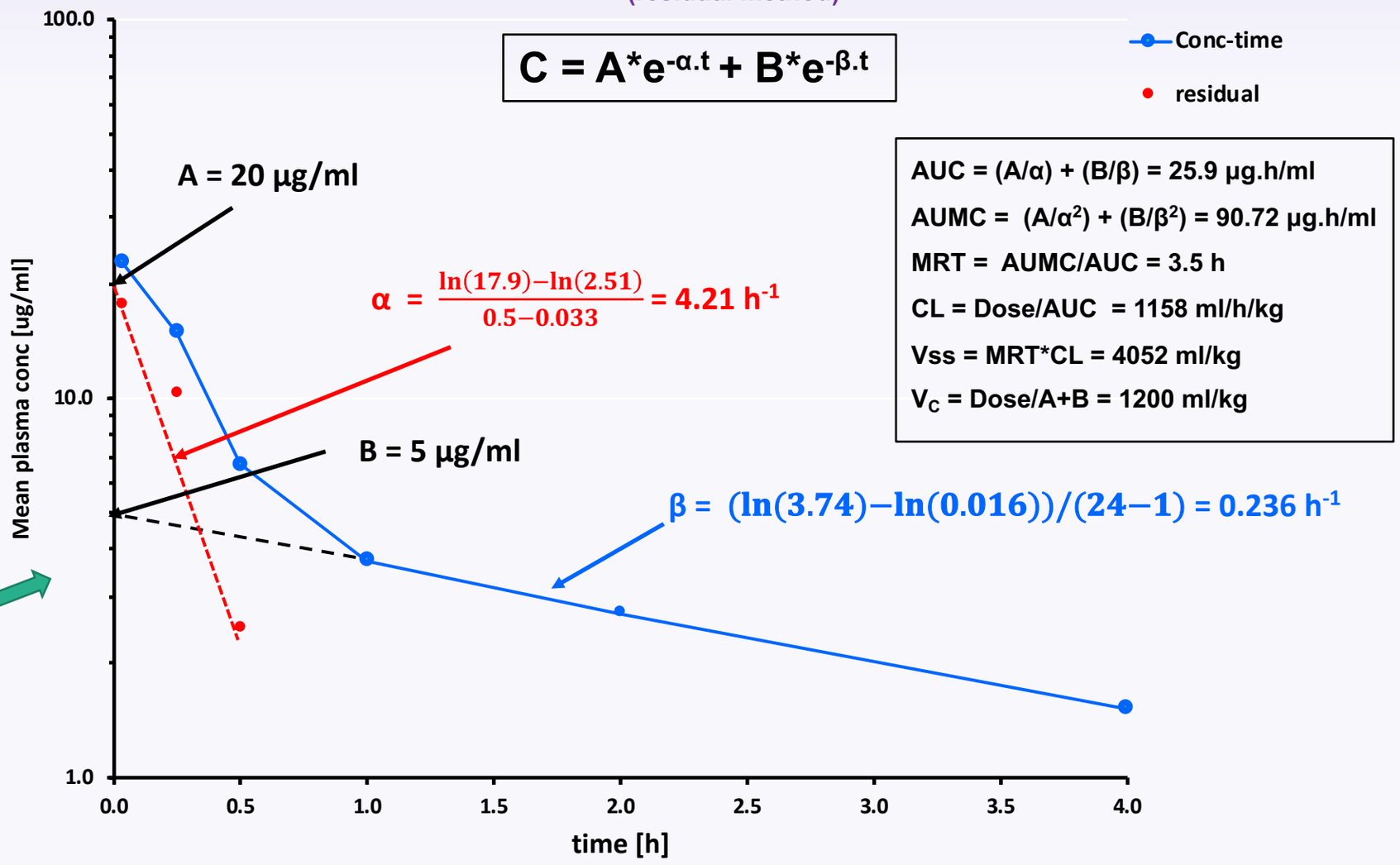


Figure 2 :Graphical estimation of noncompartmental pharmacokinetic parameters of Ciprofloxacin in rats (residual method)



Ciprofloxacin showed bi-exponential disposition. Graphical estimates of NCA PK parameters were comparable with estimates obtained by NCA methods. These estimates can be used as initial parameter estimates for modelling.

References:

1. *Gabrielsson J & Weiner D. Pharmacokinetic and Pharmacodynamic data analysis: Concepts & Applications. 3rd ed. Swedish Pharmaceutical Press*

2. Yedle et al. 2023. Neutropenic Rat Thigh Infection Model for Evaluation of the Pharmacokinetics/Pharmacodynamics of Anti-Infectives. Microb.Spect. 11(4)