Atazanavir–bilirubin interaction: a pharmacokinetic–pharmacodynamic model [Corrigendum]


On page 155, “Deriving Michaelis–Menten’s equation,26

\[ V = \frac{K_{cat}E_oC}{K_m + C} \]

for bilirubin and ATZ, we have

\[ \frac{dV_{ATZ}}{dC_{ATZ}} = K_{cat}E_oK_{ATZ} \]

and

\[ \frac{dV_{BIL}}{dC_{BIL}} = K_{cat}E_oK_{BIL} \]

at SS, when

\[ dV_{ATZ} = dV_{BIL}, \]

then we have

\[ \Delta[ATZ]_{SS} = \frac{K_{BIL}K_{ATZ}}{K_{cat}K_{m}} \Delta[BIL]_{SS} \]

and

\[ \frac{\Delta[ATZ]_{SS1}}{\Delta[ATZ]_{SS2}} = \frac{\Delta[BIL]_{SS1}}{\Delta[BIL]_{SS2}} \]  \[1\]

where \( V = \) glucuronidation reaction rate for bilirubin and ATZ, respectively; \( E_o = UGT1A1 \) enzyme concentration; \( K_m = \) Michaelis–Menten constant for bilirubin and ATZ, respectively; and \( K_{cat} = \) turnover number for bilirubin and ATZ, respectively.” should have been written as, “Deriving Michaelis–Menten’s equation,26

\[ V = \frac{K_{cat}E_oC}{K_m + C}, \]

for bilirubin and ATZ, we have

\[ \frac{dV_{ATZ}}{dC_{ATZ}} = \frac{K_{cat}E_oK_{ATZ}}{(K_{ATZ} + C_{ATZ})^2} \]

and

\[ \frac{dV_{BIL}}{dC_{BIL}} = \frac{K_{cat}E_oK_{BIL}}{(K_{BIL} + C_{BIL})^2} \]

at SS, when

\[ \Delta V_{ATZ} = \Delta V_{BIL}, \]

then we have

\[ \Delta[ATZ]_{SS} = \frac{K_{BIL}K_{ATZ}}{K_{cat}K_{m}} \Delta[BIL]_{SS} \]

and

\[ \frac{\Delta[ATZ]_{SS1}}{\Delta[ATZ]_{SS2}} = \frac{\Delta[BIL]_{SS1}}{\Delta[BIL]_{SS2}} \]  \[1\]

where \( V = \) glucuronidation reaction rate for bilirubin and ATZ, respectively; \( E_o = UGT1A1 \) enzyme concentration; \( K_m = \) Michaelis–Menten’s constant for bilirubin and ATZ, respectively; and \( K_{cat} = \) turnover number for bilirubin and ATZ, respectively.”