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


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

\[ V = \frac{K_{\text{cat}} E_0 C}{K_m + C}, \]

for bilirubin and ATZ, we have

\[ \frac{dV_{\text{ATZ}}}{dC_{\text{ATZ}}} = K_{\text{cat}} E_0 K_{\text{ATZ}} \]

and

\[ \frac{dV_{\text{b}}}{dC_{\text{b}}} = K_{\text{cat}} E_0 K_{\text{m}}, \]

at SS, when

\[ dV_{\text{ATZ}} = dV_{\text{b}}, \]

then we have

\[ \Delta[V_{\text{ATZ}}]_{\text{SS}} = \frac{K_{\text{ATZ}}}{K_{\text{ATZ}} K_m} \Delta[V_{\text{b}}]_{\text{SS}} \]

and

\[ \frac{\Delta[V_{\text{ATZ}}]_{\text{SS1}}}{\Delta[V_{\text{ATZ}}]_{\text{SS2}}} = \frac{\Delta[V_{\text{b}}]_{\text{SS1}}}{\Delta[V_{\text{b}}]_{\text{SS2}}}, \quad [1] \]

where \( V = \) glucuronidation reaction rate for bilirubin and ATZ, respectively; \( E_0 = \) UGT1A1 enzyme concentration; \( K_m = \) Michaelis–Menten constant for bilirubin and ATZ, respectively; and \( K_{\text{cat}} = \) turnover number for bilirubin and ATZ, respectively.” should have been written as, “Deriving Michaelis–Menten’s equation,26

\[ V = \frac{K_{\text{cat}} E_0 C}{K_m + C}, \]

for bilirubin and ATZ, we have

\[ \frac{dV_{\text{ATZ}}}{dC_{\text{ATZ}}} = \frac{K_{\text{cat}} E_0 K_{\text{ATZ}}}{(K_{\text{ATZ}} + C)^2} \]

and

\[ \frac{dV_{\text{b}}}{dC_{\text{b}}} = \frac{K_{\text{cat}} E_0 K_{\text{b}}}{(K_{\text{b}} + C)^2} \]

at SS, when

\[ \Delta[V_{\text{ATZ}}]_{\text{SS}} = \Delta[V_{\text{b}}]_{\text{SS}}, \]

then we have

\[ \Delta[V_{\text{ATZ}}]_{\text{SS1}} = \frac{K_{\text{ATZ}}}{K_{\text{ATZ}} K_m} \Delta[V_{\text{b}}]_{\text{SS1}} \]

and

\[ \frac{\Delta[V_{\text{ATZ}}]_{\text{SS1}}}{\Delta[V_{\text{ATZ}}]_{\text{SS2}}} = \frac{\Delta[V_{\text{b}}]_{\text{SS1}}}{\Delta[V_{\text{b}}]_{\text{SS2}}}, \quad [1] \]

where \( V = \) glucuronidation reaction rate for bilirubin and ATZ, respectively; \( E_0 = \) UGT1A1 enzyme concentration; \( K_m = \) Michaelis–Menten constant for bilirubin and ATZ, respectively; and \( K_{\text{cat}} = \) turnover number for bilirubin and ATZ, respectively.”