higher dependency into the protein domain for the more polar steroids and higher dependency into the lipid domain for the more lipophilic steroids. Other autoradiographic data are consistent with steroids being preferentially located in or close to the intercellular lipids of the stratum corneum, suggesting that the steroid stratum corneum reservoir and lipid transport is in this lipid domain of the stratum corneum (13).

4.4.3 Clearance

In general, removal of solutes from the stratum corneum depends on clearance into the viable epidermis and thence into the dermis. Most of the clearance for steroids from the dermis is due to dermal blood flow (14). Although clearance is normally assumed not to be rate limiting, a sufficiently low clearance may lead to a reduced flux through the stratum corneum and an increased amount retained in the stratum corneum (15). A reduced clearance may arise, for instance, due to vasoconstriction being present or a poor solubility in the viable epidermis or dermis. Figure 4.4 shows that reducing clearance or reducing the partition coefficient between the viable epidermis and stratum corneum increases the duration of the reservoir.

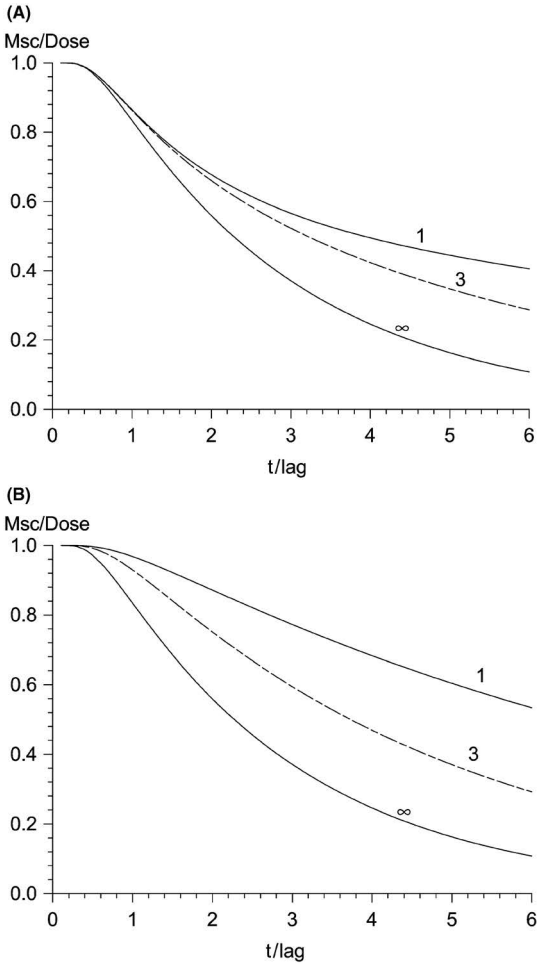

FIGURE 4.4 Effect of (A) blood clearance and (B) viable epidermal resistance relative to that of stratum corneum on the normalized amount remaining in the stratum corneum reservoir (M_{sc}/Dose) with time (t) normalized to lag time (lag time) following application of a solvent-deposited solid and using a diffusion model.