4 The Skin Reservoir for Topically Applied Solutes

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4.1 INTRODUCTION

The reservoir function of the skin is an important determinant of the duration of action of a topical solute. The reservoir can exist in the stratum corneum, in the viable avascular tissue (viable epidermis and supracapillary dermis), and in the dermis. There are a number of means by which this reservoir can be formed. A steroid reservoir in the stratum corneum has been demonstrated by the reactivation of a vasoconstrictor effect by occlusion or application of a placebo cream to the skin some time after the original topical application of steroid. Other solutes have also been reported to show a reservoir effect in the skin after topical application. In this work, we develop a simple compartmental model to understand why reactivation of vasoconstriction at some time after a topical steroid application shows dependency on time, topical solute concentration, and product used to cause reactivation. The model is also used to show which solutes are likely to show a reservoir effect and could be potentially affected by desquamation, especially when the turnover of the skin is abnormally rapid. A similar form of the model can be used to understand the promotion of reservoir function in the viable tissue and in the dermis in terms of effective removal by blood perfusing the tissues.

In this overview, we consider published examples consistent with a reservoir effect. In order to understand the effect, we present a simple pharmacokinetic model that we use to explain the