ABSTRACT

Charles University in Prague, Faculty of Pharmacy in Hradec Králové
Department of organic and bioorganic chemistry
Lenka Vencovská
Supervisor: prof. PharmDr. Kateřina Vávrová, Ph.D.
Title of diploma thesis: Interaction of cidofovir and brincidofovir with human skin in vitro

Brincidofovir (BCDV) is a broad spectrum antiviral drug used for the treatment of various viral infections. This prodrug is after targeting the site converted to cidofovir (CDV), whose topical activity has been studied.

The application of drugs into or through the skin has a number of advantages over conventional routes of administration. The disadvantage of this type of administration is the inability of drugs to penetrate through the skin in sufficient quantities. To improve skin permeation, we use substances calles transdermal permeation enhancers. 6-dimethylaminohexanoic acid dodecyl ester (DDAK) was used for this study.

In my thesis, I have studied the penetration of BCDV into isolated human skin, the effect of the addition of transdermal permeation enhancer on this permeation and the changes that the drug may exert on the skin barrier. The changes in the skin barrier have been studied by infrared spectroscopy, electrical impedance and water loss through the skin.

The results of the study show that the amount of drug passed into the epidermis is not as significantly affected by increasing the concentration of the drug as by the addition of the DDAK enhancer, and that there is no permanent damage on the skin barrier after the application of these substances.

Even a small concentration of BCDV (0.06%) in combination with DDAK could be an advantageous solution for the treatment of viral skin diseases, without systemic side effects and without reversible damage to the skin barrier. The low concentration is also advantageous from an economic point of view, where the price of the product is often a limiting factor for topical or transdermal administrations.