

The Effect of Penetration Enhancers on Transdermal Permeation of Galantamine

Yoonsun Choi, Barbara Bartoletti, Dina Ameen, Sonia Trehan,
Bozena Michniak-Kohn

Rutgers, The State University of New Jersey

Galantamine is an oral treatment for Alzheimer's disease and is commercially available as tablets and capsules. However, oral delivery of the drug is accompanied by side effects such as nausea and vomiting, largely caused by disturbance of the gastrointestinal tract, which leads to patient incompliance. In order to minimize such side effects, an alternative route has been explored. The purpose of the present study is to investigate transdermal drug delivery route, for galantamine to overcome its gastrointestinal side effects. An HPLC method for quantification of galantamine in pharmaceutical dosage form was investigated and validated for linearity and accuracy. Galantamine was formulated into 1% w/v solution and into various formulations containing four different penetration enhancers (DMSO, Tween 80, Propylene glycol, Limonene) to evaluate and compare their efficacy to improve drug permeation through skin. In-vitro transdermal permeation behavior of galantamine was examined using Franz cell diffusion testing. Full thickness dermatomed human cadaver skin (from 44-year old Caucasian male) was purchased from New York fire fighters skin bank. All the four formulations were tested at n=4 and compared with Galantamine solution (n=2) and one control was used. The samples from receptor were collected at 2h, 4h, 6h, 8h, 10h, 22h, and 24h over a 24h period and analyzed using validated HPLC method. The permeation study is currently in progress and samples are being analyzed using HPLC. After data processing, we will compare flux of galantamine through skin from different formulations to discern which penetration enhancers are ideal to explore further. Study will be continued to optimize different percentages of the chosen penetration enhancers in the near future.

