Johan Dewald Steyn et al., J Pharma Care Health Sys 2016, 3:2(Suppl)
http://dx.doi.org/10.4172/2376-0419.C1.012

Effect of transport media composition on drug solubility and permeability

Johan Dewald Steyn, Henrico Heystek and **Josias H Hamman**
North-West University, South Africa

Four different types of transport media were prepared, namely Krebs-Ringer bicarbonate (KRB) buffer, phosphate buffer (PB), fasting state simulated intestinal fluid (FaSSIF) and fed state simulated intestinal fluid (FeSSIF). The membrane permeability and solubility of abacavir, lamivudine, dapsone and furosemide were determined in the respective media. Excised pig jejunal tissue was mounted in Sweetana-Grass diffusion chambers. Drug-containing transport medium was added to the donor side of the apparatus and bi-directional transport studies were conducted. Samples (200 µl) were withdrawn every 20 min and analyzed by a validated high-performance liquid chromatography method. The apparent permeability coefficient (P_{app}) values as well as efflux ratio (ER) values were calculated from the transport data. The results obtained from both the permeability and solubility studies indicated that the choice of medium is an important variable to take into consideration when conducting permeability studies. KRB, FeSSIF and FaSSIF media rendered more predictable and repeatable drug permeation results across the excised tissue model. It was also noted that changes in transport medium composition altered drug solubility to a great extent. The most pronounced differences in membrane permeability and solubility as a function of transport medium were observed with lamivudine. Statistically significant differences were observed when comparing the P_{app} values in PB to that obtained in FeSSIF, PB and KRB transport media. The biggest differences in solubility were also noted for lamivudine, with the highest solubility being 82.6 g/l in FaSSIF media and the lowest solubility was 17.8 g/l in FeSSIF media.

Biography

Johan Dewald Steyn has completed his PhD in Pharmaceutics at the North-West University in 2010. He is currently a Senior Lecturer in Biopharmaceutics and Pharmacokinetics and has published research papers and review articles in reputed journals in this research field.

dewald.steyn@nwu.ac.za

Notes: