

2nd International Conference and Exhibition on

NANOMEDICINE AND DRUG DELIVERY

May 21-23, 2018 Tokyo, Japan

Promoting effects of cholic acid derivatives modified-elastic liposomes on permeation of insulin across TR146 cell

Santosh Bashyal, Jaewoong Choi and Sangkil Lee
Keimyung University, Republic of Korea

The main aim of this study was to investigate the potential of various elastic liposomes containing different derivatives of cholic acid to improve permeation of insulin across *in vitro* buccal cell layers. Elastic liposome containing soya lecithin and bile salt edge activators [Sodium Cholate (Sc), Sodium Deoxycholate (Sdc), Sodium Taurocholate (Stc), Sodium Glycocholate (Sgc), Sodium Deoxyglycocholate (SDGC) or Sodium Deoxytaurocholate (SDTC)] were fabricated by thin film hydration method. The prepared liposomes were characterized and performed *in vitro* permeation studies. The cell viability (MTT assay) was done to find out the safe concentration for permeation studies across TR146 cell layers. The FITC-insulin-loaded elastic liposomes were used to evaluate the quantitative and qualitative cellular uptake studies. The prepared elastic liposomes were with a particle size and zeta potential of approximately, 150-160 nm and -40 to -50 mV, respectively. After 8 hours, the steady state flux, permeability coefficient and enhancement ratio were calculated from the linear part of the permeation curve. Compared to insulin solution, the SDGC-lipo significantly improved the permeation of insulin across the TR146 cell layers, with a 5.2-fold. Moreover, SC-lipo and SDTC-lipo enhanced the permeation of insulin with a 3.2 and 3.1-fold, respectively than as compared with insulin solution. These results were further supported by quantitative and qualitative cellular uptake studies that were performed with fluorescence-activated cell sorting (FACS) analysis and confocal microscopy, respectively. Thus, these findings revealed that most of insulin were permeated through transcellular route and can efficiently enhance the permeation of insulin across buccal cell layers.

Biography

Santosh Bashyal has completed his Bachelors in Pharmaceutical Sciences from Pokhara University, School of Health and Allied Sciences, Lekhnath, Nepal. He is the Registered Pharmacist of Nepal (G 1512). He is currently an integrated MS-PhD student at College of Pharmacy, Keimyung University, Republic of Korea. He has published two research review articles as the main author and another review article as a co-author. His research interest is on drug delivery systems, buccal drug delivery, various non-invasive routes, nanocarriers, liposomes, iontophoretic drug delivery, biopharmaceuticals delivery, cell penetrating peptides (CPPs) etc.

bashyal.santosh18@gmail.com

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