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Csilla Bartos, Edina Pallagi, Piroska Szabó-Révész, Rita Ambrus, Gábor Katona, Tamás Kiss, Mernaz Rahimi, Ildikó Csóka*

Institute of Pharmaceutical Technology and Regulatory Affairs, University of Szeged, Szeged, Hungary

*Corresponding author: Ildikó Csóka
Institute of Pharmaceutical Technology and Regulatory Affairs, University of Szeged
H-6720 Szeged, Eötvös u. 6, Hungary
Tel: +36 62 545572
Fax: +36 62 545571
E-mail address: csoka@pharm.u-szeged.hu

ABSTRACT

The aim of this work was to carry out preliminary experiments for preparation of levodopa (LEVO)-containing intranasal powder. The experiments were designed according to the Quality by Design (QbD) concept. Based on prior risk assessment, LEVO and chitosan (CH) or sodium hyaluronate (HA) as mucoadhesive matrix formers were co-milled using planetary ball mill to prepare microparticles as drug delivery systems. The rotation speed, the milling time and the drug-additive ratio were evaluated to be the most relevant milling factors - as a result of the initial risk assessment; which were set according to a factorial design. The effects of critical process parameters and excipients were investigated on the particle size and surface characteristics of products, and on the crystallinity, *in vitro* dissolution and permeability of LEVO. Milling in the presence of higher amount of HA resulted in smaller average particle size of powders (D50 = 13.068 µm) and higher initial dissolution and permeation of LEVO compared to CH-containing formulations (D50 = 21.667 µm).