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Enteric-coated Alendronate sodium solid lipid nanoparticle; A novel formula to overcome barriers for the treatment of osteoporosis

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Objective: The aim of this research was to utilize nanotechnology for oral alendronate sodium delivery, wherein ALS is incorporated within enteric coated solid lipid nanoparticles (EC-SLNs). The putative advantages are enhancing the absorption and bioavailability, controlling the release, and preventing the free ALS from coming in direct contact with the GI mucosa thereby reducing the possibility of side effects.

Methods: (EC-SLNs) were prepared by a modified solvent emulsification-evaporation method based on a w/o/w double emulsion technique, effect of different process variables as solid lipid type, surfactant type and concentration, addition of charge inducing agent, enteric coating with Eudragit S100, and ultrasonication time on the particle size, zeta potential, entrapment efficiency, release in acidic and basic media were evaluated. Pharmacokinetic were conducted on rabbits.

Results: EC-SLNs were successfully prepared with particle size 74 nm, zeta potential 36 mV, and entrapment efficiency 56%. The nanoparticles released ALS only at pH 7.4 which ensure the efficiency of enteric coating. The bioavailability enhanced by more than 14 fold in rabbits.

Conclusion: EC-SLNs are a promising formula for the delivery of ALS, eliminating its oesophageal side effects, and enhancing its bioavailability.

Biography

Khaled Hosny is Associate Professor of Pharmaceutics and Industrial Pharmacy at King Abdulaziz University, Saudi Arabia. He was granted his PhD from Cairo University, Egypt, in 2006. He is currently supervising 3 PhD & 8 Master degree postgraduate students. He participated in the advanced research projects. Major research interests focused on Novel drug delivery systems. He has a lot of publications in international journals.

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