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Optimization of a nanostructured lipid carriers system for enhancing the biopharmaceutical properties of Valsartan

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Purpose: To optimize a Nanostructured Lipid Carriers System (NLCS) for the per-oral delivery of Valsartan (Val), a model BCS class II drug, in an attempt to enhance its therapeutic performance by increasing both solubility and dissolution.

Methods: Val-loaded NLCs were prepared using ultrasonic melt-emulsification method. Number of formulation factors including the type of oil/lipid, Val to lipid ratio, and surfactant ratio were investigated. The prepared NLC were evaluated for their particle size, polydispersity index, zeta potential, and drug entrapment efficiency. The *in vitro* drug release profiles were evaluated using a dialysis bags with cut-off 12 KD.

Results: The prepared NLCs showed average sizes between 423.99±12.73 and 805.53±178.5nm, and polydispersity index in the range of 0.272 to 0.349. The zeta potential values were between -3.34 and -10.59mV. The entrapment efficiency was not very high between 43.5 to 63.7%. The *in vitro* release followed a bi-phasic pattern with an initial rapid Val release followed by a slow release varying according to the composition. Two formulations F2 and F4 showed complete drug release within the first two hours. The optimum surfactant ratio was 25% by weight of the total lipid. The 1 to 9 drug to lipid ratio was the optimum for the particle size and EE.

Conclusion: NLC successfully enhanced the Val release rate and dissolution with high potential to enhance its bioavailability.

Biography

Khalid Al Harbi is currently doing Internship at National Guard Hospital-Riyadh, Saudi Arabia. He has recently completed his PhD from King Saud bin Abdul-Aziz University for Health Sciences, KSA. He has published 3 papers in reputed journals.

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