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Self nanoemulsifying drug delivery system of olmesartan medoxomil: *in vivo* and *in vitro* evaluation

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The purpose of the current investigation was to improve the solubility of olmesartan medoxomil (OLM), a poorly water-soluble drug which exhibits low oral absorption bioavailability, in a self-nanoemulsifying drug delivery system (SNEDDS) that is suitable for oral administration. On the solubility study and emulsification ability study, Acrysol K 140 as surfactant, Transcutol P as co-surfactant and Capmul MCM C8 as lipid component were selected. Differential scanning calorimetry (DSC) and Fourier transform-infrared spectroscopy (FT-IR) study indicated that there are not any physical and chemical interactions occurring in formulation. Form ternary phase diagram, wider microemulsion region the surfactant to co-surfactant proportion was selected as 1:1. From the ternary phase diagram, different six formulations were prepared on the base different concentration of excipients. Optimized formulation (MS1) was diluted with infinite purified distill water which was transparent and spontaneous emulsion. Droplet was found very less (30.15 nm) and polydispersity index was near to 0 (0.203). Zeta potential of optimized formulation (MS1) was–11.3. Formulation MS1 was release 86.7% within 120 min and pure drug was 43.78% release in 120 min. stability study was performed at 40°C/75RH for three month. Oral bioavailability was carried using male SD rats. Plasma concentration versus time graph was plotted. From the graph, AUC and Cmax were calculated. Calculated on AUC0 12hr, the mean relative bioavailability of OLM SNEDDS was 260% increased as compared to OLM PEG 400 suspensions. Thus from above results, it can be concluded that SNEDDS formulation has improved the relative bioavailability of olmesartan medoxomil.

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