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Abstract

The aim of this study was to prepare and characterize a new nanocarrier for oral delivery of tamoxifen citrate (TMC) as a lipophilic oral administrated drug. This drug has low oral bioavailability due to its low aqueous solubility. To enhance the solubility of this drug, the microemulsion system was applied in form of oil-in-water. Sesame oil and Tween 80 were used as drug solvent oil and surfactant, respectively. Two different formulations were prepared for this purpose. The first formulation contained edible glycerin as co-surfactant and the second formulation contained Span 80 as a mixed surfactant. The results of characterization showed that the mean droplet size of drug-free samples were in the range of 16.64-64.62 nm with a PDI value of less than 0.5. In a period of 6 months after the preparation of samples, no phase sedimentation was observed, which confirmed the high stability of samples. TMC with a mass ratio of 1% was loaded in the selected samples. No significant size enlargement and drug precipitation were observed 6 months after drug loading. In addition, the drug release profile at experimental environments in buffers with pH=7.4 and 5.5 showed that in the first 24 hrs, 85.79 and 100% of the drug was released through the first formulation and 76.63 and 66.42% through the second formulation, respectively. The in-vivo results in BALB/C female mice showed that taking microemulsion form of drug caused a significant reduction in the growth rate of cancerous tumor