Abstract

Erythrocytes are one of the most potential biocompatible carriers for various biologically active products including drugs. In the present study, 46.7% of Artemether, 25.42% of Lumefantrine and 26% of Ciprofloxacin were successfully loaded in erythrocytes by the hypotonic pre-swelling method and 12.8% of Artemether, 10.18% of Lumefantrine and 7.8% of Ciprofloxacin were loaded in erythrocytes by using hypotonic dilutional method. The in vitro properties of drug loaded erythrocytes were evaluated and compared with the unloaded cells and it was observed that cell count after drug loading was in normal range, no appreciable detrimental effects on the erythrocyte morphology were observed in comparison with unloaded cells as indicated by scanning electron microscopy. Osmotic fragility and turbulence fragility indicated that the loaded cells are less resistant as compared to the unloaded cells. The release rate of Artemether, Lumefantrine and Ciprofloxacin were observed to be 81%, 85%, and 84% respectively after 24 hrs. The assay of the drugs was done by HPLC methods. Furthermore, kinetic modelling of drug release assay was also performed. The release of Artemether was observed to follow zero order, first order, and Korsmeyers-Peppas models whereas Lumefantrine followed zero order kinetics and Ciprofloxacin followed first order kinetics. The study suggests that the encapsulation of drugs into erythrocytes has made this technology competitive with other drug delivery systems.