ABSTRACT

THE EFFECT OF DUAL LOADING PRIMAQUINE AND CHLOROQUINE ON THE INTEGRITY OF LIPOSOMAL BILAYER MEMBRANE

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Primaquine is an effective anti-malaria drug for the treatment of sporozoites in hepatic phase of malaria. However, it has been reported that primaquine can cause haemolysis in patient with glucose-6-phosphate dehydrogenase (G6PD) deficiency. Chloroquine has been known affecting primaquine metabolism, thus reducing primaquine toxicity and increasing primaquine efficacy. In the previous study, the encapsulation efficiency of drug loading primaquine chloroquine and release of both drugs was lower than their single drug loaded liposomes. This is presumably due to the interaction between primaquine, chloroquine, and phospholipid in the bilayer membrane. Thus, the analysis was carried out by determining the physicochemical characteristics of the liposomal bilayer membrane using Fourier Transform Infrared (FTIR) Spectroscopy, Powder X-Ray Diffraction (P-XRD), and Differential Thermal Analysis (DTA) followed by the calcein release test to determine the effect of dual loading primaquine and chloroquine on the integrity of the liposomal bilayer membrane. The results showed that dual loading of primaquine and chloroquine influences the integrity of the liposomal bilayer membrane. Moreover, it can be seen that primaquine has stronger effects on membrane integrity than chloroquine, which has supported by calcein release profile from the liposomes. In conclusion, dual loading of primaquine and chloroquine highly affected the integrity of liposomal bilayer membrane.

Keywords: primaquine, chloroquine, liposomes, dual loading, bilayer membrane, release of calcein