Uji disolusi secara in vitro dan efek penambahan polivinil pirolidon sebagai inhibitor pengendapan pada formulasi Self Emulsifying Drug Delivery System obat artemisinin = In vitro dissolution of Self Emulsifying Drug Delivery System for artemisinin and the fffects of polyvinyl pyrrolidone as a precipitation inhibitor

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Abstrak

Artemisinin merupakan obat antimalaria yang paling efektif saat ini. Namun, artemisinin memiliki kelemahan utama yang menghambat efikasinya yaitu sifatnya yang kurang larut dalam air. Kelarutan artemisinin yang rendah dalam air dapat menyebabkan laju disolusi dan bioavailabilitas yang rendah. Tujuan dari penelitian ini adalah untuk membuat formulasi zat aktif antimalaria artemisinin dalam Self Emulsifying Drug Delivery System untuk meningkatkan laju disolusi obat dan untuk mengetahui efek penambahan polimer polivinil pirolidon sebagai inhibitor pengendapan. Formulasi Self Emulsifying Drug Delivery System diuji kestabilan emulsi secara visual, ukuran partikel, zeta potensial, dan disolusi in vitro. Uji kestabilan emulsi menunjukkan penambahan kosentrasi surfaktan mampu meningkatkan kestabilan. Spektrum Fourier Transform Infrared Spectroscopy menunjukkan interaksi yang terdapat pada formulasi hanya berupa interaksi fisik tanpa adanya perubahan gugus fungsi. Formulasi SEDDS dapat membentuk emulsi dalam medium lambung atau usus dengan ukuran partikel 121 nm - 492 nm dengan nilai indeks polidispersitas 0,36 - 0,59. Zeta potensial formulasi Self Emulsifying Drug Delivery System sebesar -30 mV. Penambahan polivinil pirolidon dapat menghambat terjadinya pengendapan dan meningkatkan pelepasan obat artemisinin dari semula 30% pada medium HCl dan 28 % pada medium buffer fosfat pH 6,8 menjadi sebesar 77% pada medium HCl 0,1 N dan 95% pada medium buffer fosfat pH 6,8 selama 6 jam. .....Artemisinin is the most effective antimalarial drug today. However, artemisinin has low solubility in water that reduces its efficacy. The low solubility of artemisinin in water causes a low dissolution rate and bioavailability. The purpose of this study is to prepare a Self Emulsifying Drug Delivery System for artemisinin to increase the rate of drug dissolution and to determine the effect of polyvinyl pyrrolidone polymer as a precipitation inhibitor. The Self Emulsifying Drug Delivery System was prepared by mixing artemisinin in various compositions of polysorbate 20 or polysorbate 80, polyethylene glycol 400, and oleic acid. The formulations were tested for emulsion stability, particle size, zeta potential, and in vitro dissolution. The emulsion stability test showed that the addition of surfactant concentration increased the stability of the emulsion. The Fourier Transform Infrared Spectroscopy spectrum showed that the molecular interactions observed were only physical interactions without any changes in functional groups. The Self Emulsifying Drug Delivery System could make emulsion in the stomach or intestine medium with a droplet size of 121 nm - 492 nm and polydispersity index value of 0.36 - 0.59. The zeta potential of the Self Emulsifying Drug Delivery System formulation is -30 mV. The addition of polyvinyl pyrrolidone inhibited precipitation and increased the release of artemisinin drugs from 30% in HCl medium and 28% phosphate buffer medium to 77% in HCl medium and 95% in phosphate buffer medium for 6 hours.