Optimisasi formula serbuk inhalasi rifampisin dengan pembawa kitosan-xanthan menggunakan teknik semprot kering = Optimization rifampicin dry powder inhalation formula with chitosan-xanthan carrier using spray dry technique

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Abstrak

ABSTRAK
Rifampisin merupakan salah satu obat pilihan untuk terapi laten tuberkulosis dan sedang dikembangkan untuk penghantaran tertarget ke paru-paru. Penelitian ini bertujuan untuk mendapatkan formula serbuk inhalasi rifampisin dengan pembawa kitosan-xanthan KX yang optimal menggunakan metode respon permukaan Response Surface Methodology. Suatu desain eksperimen yang terpola secara statistik dibuat dengan metode Box Behnken dengan variasi konsentrasi larutan KX, rasio rifampisin/KX, dan variasi suhu inlet pada alat spray dryer. Serbuk inhalasi dikarakterisasi terhadap respon efisiensi penjerapan EE , ukuran partikel, serta pelepasan rifampisin di kondisi paru pH 7,4 dan makrofag paru pH 4,5. Hasil penelitian diperoleh 14 formula serbuk inhalasi dengan nilai efisiensi penjerapan 112,00 -149,08 , ukuran partikel rata-rata 0,599-5,506 m, pelepasan rifampisin di dalam medium pH 7,4 6,54 -22,95 dan medium pH 4,5 12,02-48,60 . Berdasarkan program Design Expert 9.0.6.2, didapatkan kondisi yang optimal untuk pembuatan serbuk inhalasi rifampisin adalah nilai konsentrasi larutan KX 0,5, rasio rifampisin:KX 1:1, dan suhu inlet spray dryer 143 C. Pada kondisi dan parameter tersebut, diprediksikan akan didapatkan serbuk inhalasi rifampisin dengan nilai EE 107,1 , ukuran partikel 1,001 m, pelepasan rifampisin di dalam medium pH 7,4 17,8 dan medium pH 4,5 32,6 dengan nilai desirability yaitu 0,86.
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ABSTRACT
Rifampicin is drug of choice for anti tuberculosis therapy and currently be developed to be targeting drug delivery to pulmonary. The study was aimed to get an optimal formula of Rifampicin dry powder inhalation with chitosan xanthan CX carrier by spray dry method using response surface methodology RSM. An experiment design was formed statistically by Box Behnken method and was designed by variation of CX solution, Rifampicin CX ratio, and variation of inlet temperature at the spray dryer. The dry powder inhalation was characterized with response of entrapment efficiency EE, particle size, and rifampicin release inside pulmonary pH 7.4 and pulmonary macrophage pH 4.5. The characterization from 14 formulas were resulted the response of EE as 112.00 149.08, average particle size 0.599 ndash 5.506 m, rifampicin release in medium pH 7.4 s 6.54 22.95 and in medium pH 4.5 as 12.02 ndash 48.60 . The optimal formula of Rifampicin dry powder inhalation with CX was obtained from Design expert software in CX concentration 0.5, Rifampicin CX ration 1 1, and inlet temperature of the spray dryer is 143 C. If the manufacturing process of dry powder inhalation was prepared in those condition and parameters, was predicted that the result of Rifampicin dry powder inhalation with EE 107,1 , particle size 1.001 m, the release of rifampicin in medium pH 7.4 as 17.8 and medium pH 4.5 as 32.6 with desirability value 0.86.