Formulasi Beads Kitosan Tripolifosfat yang Mengandung Deksametason-Probiotik Tersalut Eudragit sebagai Sistem Penghantaran Kolon Tertarget = Formulation of Chitosan Tripolyphosphate Beads Containing Dexamethasone-Probiotic Coated With Eudragit As Colon Targeted Drug Delivery System

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Abstrak

Inflammatory Bowel Disease (IBD) yang terdiri dari kondisi utama, yaitu Ulcerative colitis dan Chron’s disease, mengalami peningkatan prevalensi di Asia. Obat yang dapat digunakan untuk mengatasi IBD adalah deksametason. Deksametason memiliki aktivitas spesifisitas yang rendah dan menimbulkan efek samping jika digunakan dalam jangka panjang sehingga perlu diformulasikan sebagai penghantaran tertarget kolon untuk mengatasi penyakit IBD. Penelitian ini bertujuan untuk memperoleh formulasi dan karakterisasi beads kitosan tripolifosfat mengandung deksametason (Formula 1) serta deksametason-probiotik Lactobacillus acidophilus dan Bifidobacterium longum (Formula 2) tersalut Eudragit L100 (Formula A) dan Eudragit S100 (Formula B). Beads dibuat berdasarkan metode gelasi ionik melalui penetesan dengan bantuan pompa peristaltik, kemudian disalut menggunakan metode pencelupan. Beads dievaluasi berdasarkan uji morfologi dan ukuran partikel, daya mengembang, efisiensi penjerapan, efisiensi proses, uji termal, serta analisis difraksi sinar X. Uji pelepasan obat dilakukan pada medium HCl pH 1,2 selama 2 jam, dapar fosfat pH 7,4 selama 3 jam, dan dapar fosfat pH 6,8 selama 3 jam. Berdasarkan hasil evaluasi, keseluruhan formulasi memiliki pelepasan rendah pada medium dapar fosfat pH 6,8. Pelepasan obat yang paling besar adalah formula 2B dengan persentase pelepasan obat sebesar 26,810±0,0302%. Formula 2B merupakan formula yang paling optimal dengan bentuk spheris dengan kandungan lembap rata-rata 2,17 ± 0,0004%, distribusi ukuran partikel dominan pada rentang 1,25-1,70 mm, serta memiliki persentase penjerapan sebesar 76,882± 0,0248% dan persentase kandungan obat sebesar 25,6275 ± 0,0082%. Berdasarkan uji analisis sinar X dan uji termal, beads telah mengalami perubahan fisik. Dapat disimpulkan bahwa formula beads kitosan tripolifosfat belum dapat digunakan sebagai sistem penghantaran tertarget kolon.

.....Inflammatory Bowel Disease(IBD) with two main conditions, Ulcerative Colitis and Chron’s disease has an increase of prevalence in Asia. One of drugs to treat IBD is Dexamethasone. Dexamethasone has lack of specificity and side effect after long-term administration, thus it must be formulated as colon targeted drug to treat IBD. This aim of research was to formulate and characterize the Chitosan tripolyphosphate beads of Dexamethasone(Formula 1) and Dexamethasone-probiotic(Formula 2), such as Lactobacillus acidophilus and Bifidobacterium longum coated with Eudragit L100 (Formula A) and Eudragit S100(Formula B). Beads was prepared based on ionic gelation using dropping method enhanced with peristaltic pump, then coated using dipped method. Beads were evaluated based on morphology, particle size, swelling ability, encapsulation efficiency, process efficiency, thermal, and X-Ray Diffractometry(XRD) analysis. Drug release assay was done in HCl pH 1.2 medium for two hours, phosphate buffer pH 7.4 for three hours, and phosphate buffer pH 6.8 for three hours. Based on the evaluation, all the formulation has low cumulative drug release in phosphate buffer pH 6.8. Based on in vitro release study, the highest cumulative drug release was formula 2B with the percentage of cumulative drug release was 26.810±0.030%. Formula 2B was the

most optimum formulation with a spherical morphological, moisture content of 2.17±0.0004%, particle size distribution dominantly at 1.25-1.70 mm, entrapment efficiency of 76.882±0.0248%, and drug content of 25.6275±0.0082%. Based on XRD analysis and thermal test, beads have change physically. In conclusion, the formulation of chitosan tripolyphosphate beads cannot be used as colon targeted delivery system.