Uji efisiensi dan disolusi kalium diklofenak secara in vitro menggunakan hidrogel semi ipn kitosan metil selulosa = In vitro dissolution and efficiency test of diclofenac potassium using a chitosan methylcellulose semi ipn hydrogel

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Abstrak

Kalium diklofenak memiliki waktu paruh yang pendek sehingga obat akan cepat dieleminasi dari tubuh. Enkapsulasi kalium diklofenak menggunakan polimer biodegradable sebagai sistem pengantar obat terkontrol dapat meminimalkan masalah tersebut. Pada penelitian ini, enkapsulasi kalium diklofenak menggunakan hidrogel semi interpenetrating polymer network (semi-IPN) berbasis pada kitosan dan metil selulosa telah dilakukan dengan metode in situ loading dan post loading. Komposisi hidrogel semi-IPN terdiri dari kitosan : metil selulosa 60 : 40 (b/b) dan glutaraldehid 0,1 M 2% (b/b) terhadap kitosan sebagai agen pengikat silang. Karakterisasi hidrogel semi-IPN dilakukan menggunakan tensile strength test, spektorfotometer FTIR, dan mikroskop stereo. Efisiensi loading kalium diklofenak dengan metode in situ loading mencapai 100% dan metode post loading 37% diukur dengan spektrofotometer UV-Vis. Pelepasan kalium diklofenak memiliki pelepasan yang lebih rendah pada pH 1,2 selama 2 jam (11% in situ loading dan 16% post loading) dibandingkan pada pH 7,4 selama 12 jam (94% in situ loading dan 98% post loading).
.....Diclofenac potassium has a short half-life time that causes it to be quickly eliminated from the body. Using biodegradable polymer as drug encapsulation for controlled release drug delivery system can minimize the problem. In this research, diclofenac potassium is being encapsulated by semi interpenetrating polymer network (semi-IPN) hydrogels based on chitosan and methylcellulose. The encapsulation has been conducted by both in-situ loading and post loading methods. The biodegradable polymer hydrogel is composed by 60:40 (w/w) ratio of chitosan : methylcellulose and 0,1 M 2% glutaraldehyde (w/w) in regard to the weight of chitosan as crosslinking agent. The hydrogels and microcapsules were then characterized by tensile strength test, FTIR spectrophotometry, and stereomicroscopy. The entrapment efficiency of diclofenac potassium by in-situ loading method was found to be up to 100% and 49% for post loading method as was measured by UV spectroscopy. The dissolution of diclofenac potassium in pH 1,2 which was around 11% for in-situ loading and 16% for post loading in 2 hours is lower than dissolution in pH 7,4 in 12 hours (94% for in-situ loading and 97% for post loading).