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Characterization and microbiological evaluation of chitosan-alginate microspheres for cefixime vaginal administration

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Highlights

- A cefixime vaginal formulation was developed based on chitosan-alginate microspheres.
- Entrapped amount increased with loading amount up to an optimal drug:polymer ratio.
- Swelling properties, drug entrapped amount and release rate were directly related.
- Microspheres loaded with 30 mg/mL drug showed the best water uptake and release rate.
- Microspheres loaded with 30 mg/mL drug showed the highest activity against E coli.

ABSTRACT

Chitosan-alginate microspheres (MS) were developed for cefixime vaginal administration, to overcome problems associated with its oral administration. The effect of increasing drug-loading amount, by keeping the chitosan-alginate content constant, was investigated. Mucoadhesion studies indicated that all formulations assured in situ permanence longer than 2 h. Entrapment efficiency increased with drug loading concentration in the starting solution, reaching a plateau at 30 mg/mL indicative of the achievement of an optimal drug-to-polymer ratio. MS swelling properties increased with the entrapped drug amount, and, interestingly, water-uptake reached its maximum value at the same drug loading concentration of 30 mg/mL. The relationship found between MS water-uptake and drug release rate confirmed MS prepared with 30 mg/mL cefixime as the best formulation. Microbiological studies showed a relation between cefixime release rate from MS and

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