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Preparation of triamcinolone acetonide nanosuspension with biodegradable polyester polymers modified by chitosan derivatives

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Background and Aims: In recent years, many efforts have been made to prepare biodegradable nanoparticles as targeted drug delivery systems. Poly lactide-co-glycolide (PLGA) has been used extensively before for the preparation of different drug delivery systems including nanoparticles. In this study PLGA was used to prepare nanoparticles as a carrier for triamcinolone acetonide using emulsification/solvent evaporation method. Chitosan was used for treatment of nanoparticles' surface charge.Triamcinolone acetonide is one of the corticosteroids which has been approved to treat Uveitis.
Methods: To prepare PLGA nanoparticles containing triamcinolone acetonide, known amounts of PLGA and triamcinolone acetonide were dissolved in dichloromethane (DCM). The mixture was then added to an aqueous mixture of PVA (0.5%) and known amounts of chitosan (PH=5) while using probe sonicator at 20% power for 2 minutes.
Results: Nanoparticles prepared in this study where spherical with a size of approximately 220 nm and surface charge of approximately +15.
Conclusions: The effect of different variables such as the amount and ratio of drug, polymer, solvents and emulsifier on the nanoparticles characteristics was investigated. The profile of drug release from nanoparticles in phosphate buffer of PH 7.4 was also measured.

Keywords: Nanoparticles; Chitosan; Uveitis; Triamcinolone acetonide