

Triamcinolone acetonide nanoparticles for ocular delivery: preparation and *in vitro* evaluation

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Background and Aims: The purpose of this project was to formulate triamcinolone acetonide (TA) nanoparticles (NPs) using poly (d,l-lactide-co-glycolide) (PLGA) (negative surface charge) polymer, and assess their physicochemical characteristics for use as a topical nanosuspension in ocular drug delivery. This is based on the background that concerning topical nanosuspension of a drug may progress its effectiveness in the treatment and prevention of uveitis and eradicate the side effects related with its ocular injection as well.

Methods: Polymeric NPs of TA were prepared using the modified emulsification/solvent diffusion method followed by successive filtration through 5, 3, and 0.8 μ m filters to eliminate the non-encapsulated TA crystals, and thus, minimize their deceptive effect on encapsulation efficiency and *In vitro* burst effect. Aspects related to preparation (type of stabilizer, homogenization method, the drug/polymer ratio and solvent elimination method) were studied in terms of their consequence on NPs size as well as drug loading efficiency. Physicochemical studies including Scanning electron microscopy (SEM), Differential scanning calorimetry (DSC), Fourier transform infrared spectrometry (FT-IR), X-ray diffraction, and *in vitro* TA release on PLGA-TA- NPs (ζ potential: -6.8 mV) .

Results: NPs of appropriate size (195nm) with a smooth surface, controlled release profile were resulted and the drug was dispersed and loaded well within the polymers (3%).

Conclusions: Accordingly, the prepared NPs appear to be suitable alternate for use in ocular drug delivery with the aim of management and treatment of uveitis.

Keywords: Triamcinolone acetonide; PLGA; Successive Filtration