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Factors affecting Finasteride PLGA microparticle size

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Introduction: Finasteride has been orally used as 5α-reductase inhibitor for the treatment of androgenetic alopecia. Finasteride topical formulations would be advantageous over oral tablets, because of their reduced systemic side effects. In this study, finasteride were encapsulated into biodegradable polymer for transfollicular delivery to decrease systemic side effects of finasteride. Factors affecting the size of finasteride microparticles were investigated. **Method and materials:** Finasteride microparticles are prepared by solvent evaporation technique by varying amount of finasteride loading (50, 100 to 150 mg), polylactide-co-glycolide (PLGA) polymer content (50, 100, 150 mg), stirring speed (6000, 10000, 14000 rpm), stirring time (12, 16, 20 hours), concentration of polyvinyl alcohol (PVA) (0.25, 0.50, 0.75, 1 %w/v), stabilizer type (PVA, Pluronic®F-68, Pluronic®F-72) and ethyl acetate was used as solvent. **Results:** Microparticles obtained from PLGA 50, 100, 150 (mg/ ethyl acetate 10 ml) exhibited mean particle sizes in the range of 2.88±8.98 μm, 3.73±9.25 μm and 4.27±17.65 μm, respectively. Increase stirrring speed from 6000 to 10000 and 14000 rpm showed microparticle sizes of 5.788±1.941 μm, 2.498±0.525 μm and 1.882±0.630 μm, respectively. Increase stirring time from 12, 16, 20 hours gave particle size of 1.921±0.528 μm, 1.697±0.476 μm and 1.640±0.478 μm, respectively. Microparticles obtained were in the same particle size range independent of the stabilizer type used while the investigated finasteride loading amount showed no difference in diameter of microparticles. **Conclusions:** Factors affecting PLGA microparticle size have been investigated. The obtained information could be useful for the development of microparticles for transfollicular delivery that expected to reduce systemic side effects of finasteride.

Keywords: Finasteride, Microparticles, PLGA, transfollicular, size

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