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In Vitro Release of Indomethacin and Hydrocortisone from Suspensions and Self-Emulsifying Oils

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Many drug substances exhibit low solubility in water, which results in their poor bioavailability. Among ophthalmic preparations, oil solutions, suspensions and ointments are formulations prepared for such compounds. Promising modern drug carries are self-emulsifying drug delivery systems (SEDDS) which are isotropic mixtures of oils and surfactants. Due to presence of surfactants improved solubility and transcorneal passage of the active substances can be expected [1].

The aim of this study was to compare the in vitro release of indomethacin (IND) and hydrocortisone (HC) from SEDDS and aqueous or oily suspensions. The release experiments were carried out for 6 h at 37°C using dialysis cellulose membrane and acceptor fluid imitating composition of lacrimal fluid.

Amount (mg) of the drug and the percentage of the dose delivered to the acceptor medium was measured and diffusion coefficients were calculated. After 6 h about 7 mg (40%) of IND was released from SEDDS and about 5 mg (30%) from 0,6% aqueous and oily suspensions. Only small percentage of HC was released (below 20%) from the aqueous and oily suspensions. However percentage of hydrocortisone released from SEDDS (containing 1% or 5% Cremophor EL) came to over 60%. The results suggest that increased solubility in SEDDS [2] does not necessarily increase diffusion through the dialysis membrane and in vivo effect on bioavailability can not be easily predicted.

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