OP-1

DOI: 10.14232/syrptbrs.2020.op1

In vitro and *ex vivo* investigation of steroid containing ocular drug delivery systems

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The poor bioavailability in ocular drug delivery is well known, which is mostly caused by the special defensive mechanisms and complex anatomical structure of human eye. Possibilities are known for inducing enhanced therapeutic efficacy - due to increasing the solubility of drug and the residence time on the eye surface. Formulation specialists need to ensure not only the optimal drug permeation but also the required microbiological stability. The widely applied benzalkonium-chloride is toxic on the corneal epithelial cells, therefore use of alternative, nontoxic preservative agents is needed [1].

Cyclodextrin containing, mucoadhesive ocular drug delivery systems were optimized by our research group. Results of mucoadhesion, surface tension, viscosity, *in vitro* drug diffusion and antimicrobial effectiveness test were previously published [2]. Afterwards, *in vitro* toxicity and permeability were studied on human corneal epithelial cell line, and *ex vivo* drug permeability was tested using porcine corneal model. As the results show, toxicity and permeability are more suitable, than benzalkonium-chloride containing compositions or suspension forms. In summary, the prepared formulations could be innovative approaches for steroid containing eye drops with increased bioavailability.

References

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Acknowledgements

This work was supported by the UNKP-19-3-SZTE-26 New National Excellence Program of the Ministry for Innovation and Technology

Supervisor: Zoltán Aigner