

Formulation of Adapalene Emulgel and its Optimization for its Potential Topical Application

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SUMMARY. Acne vulgaris, usually called as acne is a skin disorder differentiated by pimples, and greasy skin. Adapalene is a first line therapy for acne treatment which can be used alone or in combination with drugs, so objective was to develop topical emulgels that can be used effectively and can be self-administered as well. Emulgels were prepared in two steps: first the emulsion was developed in which drug was incorporated into oil phase and later mixed with aqueous phase at 1000 rpm. Emulsion consisting of oil phase droplets in external phase was mixed bit by bit with gel phase that was already prepared. Emulgels containing carbopol 940 and HPMC k15 showed different results of physical appearance, viscosity, spreadability and *in vitro* release. Emulgels which were prepared with carbopol 940 showed better results over HPMC emulgels. E13 that containing low concentration of polymer and high concentration of emulsifier was found to be optimum. FTIR spectra of pure drug and formulation showed that there were no major differences in the peaks and incompatibility was not found in any of the formulation. E13 exhibited the maximum viscosity and least spreadability as well. Drug release followed zero-order release and n value showed Fickian transport mechanism. It is concluded that topical emulgels are newer dosage form of drug that can be easily developed with help of different polymers and proved to be better alternate to conventional therapy routes and skin friendly as well.

RESUMEN. El acné vulgar, generalmente llamado acné, es un trastorno de la piel diferenciado por espinillas y piel grasa. Adapalene es una terapia de primera línea para el tratamiento del acné que se puede usarse solo o en combinación con medicamentos, por lo que el objetivo era desarrollar emulgeles tópicos que se puedan usar de manera efectiva y también se puedan autoadministrar. Los emulgeles se prepararon en dos pasos: primero se desarrolló la emulsión en la que el fármaco se incorporó a la fase oleosa y luego se mezcló con la fase acuosa a 1000 rpm. Los emulgeles que contienen carbopol 940 y HPMC k15 mostraron diferentes resultados de apariencia física, viscosidad, capacidad de esparcimiento y liberación *in vitro*. Los emulgeles que se prepararon con carbopol 940 mostraron mejores resultados que los emulgeles HPMC. E13, que contenía baja concentración de polímero y alta concentración de emulsionante, resultó ser óptimo. Los espectros de FTIR de fármaco puro y formulación mostraron que no había diferencias importantes en los picos y no se encontró incompatibilidad en ninguna de las formulaciones. E13 exhibió la viscosidad máxima y la menor capacidad de propagación también. La liberación del fármaco mostró liberación de orden cero y el valor n el mecanismo de transporte Fickiano. Se concluye que los emulgeles tópicos son una forma farmacéutica más nueva que se puede desarrollar fácilmente con la ayuda de diferentes polímeros y se ha demostrado que son una mejor alternativa a las rutas de terapia convencionales y amigables con la piel

KEY WORDS: adapalene, carbopol 940, emulgels, emulsion, HPMC k15.

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