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Film forming emulsions for sustained dermal release of nonivamide

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Nonivamide (NVA) is used in the therapy of chronic pruritus accompanied with diseases such as atopic dermatitis or psoriasis. Currently available formulations containing NVA need to be applied 4 to 6 times a day. As multiple applications a day frequently lead to poor compliance of patients, a formulation permitting sustained release of NVA is needed to reduce the number of applications per day. The aim of our study was to develop a film forming o/w emulsion containing NVA in the inner oil-phase, making it easy and convenient to treat larger areas of affected skin over a long time.

Simple oil-in-water emulsions were prepared from medium chain triglycerides and an aqueous solution of polyvinylalcohol. By addition of an aqueous dispersion of poly(ethylacrylate methylmethacrylate trimethylammonioethyl methacrylate chloride) (quaternary PMMA) and/or an aqueous dispersion of poly(ethylacrylate methylmethacrylate) (neutral PMMA) a water insoluble sustained release matrix was built around the droplets upon water evaporation. We investigated the ability of quaternary PMMA and neutral PMMA and their mixtures to entrap the oil droplets of an o/w emulsion in the dry state, and their ability to extend the contact time of drugs dissolved in the dispersed lipid phase to the skin as well as drug permeation from these dried emulsion films.

In-vitro permeation of NVA from film forming emulsions containing 1 % NVA was studied in comparison to the immediate release formulation "Hydrophilic Nonivamide Cream" containing 1 % or 0.1 % NVA (HNC 1 % or HNC 0.1 %). We found that film forming emulsions were able to reduce flux of the api by ten fold compared to HNC 1 %. This flux was found to be similar to that from HNC 0.1 %. Finite dose experiments revealed that NVA was released from film forming emulsions with constant flux over a period of 24 hours.

Therefore film forming emulsions may reduce application frequency and thereby enhance patient convenience and compliance. Thus the long term treatment of diseases such as chronic pruritus or pain may be improved.

