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STABILITY OF AN OPHTHALMIC MICELLAR FORMULATION OF CYCLOSPORINE A IN UNOPENED MULTIDOSE EYEDROPPERS AND IN SIMULATED USE CONDITIONS

P. CHENNELL[(1)]*, L. DELABORDE[(2)], M. WASIAK[(2)], M. JOUANNET[(2)], E. FESCHET-CHASSOT[(1)], F. CHIAMBARETTA[(3)], V. SAUTOU[(1)]
(1) UNIVERSITE CLERMONT AUVERGNE, CHU CLERMONT FERRAND, CNRS, SIGMA CLERMONT, ICCF, F-63000 CLERMONT-FERRAND, FRANCE
(2) CHU CLERMONT-FERRAND, POLE PHARMACIE, F-63000 CLERMONT-FERRAND, FRANCE
(3) CHU CLERMONT-FERRAND, SERVICE OPHTALMOLOGIE, F-63000 CLERMONT-FERRAND, FRANCE

* : corresponding author:
Dr Philip Chennell, Hospital Pharmacist, PharmD MSc
pchennell@chu-clermontferrand.fr
Phone: +(33)4 73 75 10 36
Pôle Pharmacie
CHU Clermont-Ferrand
58 rue Montalembert, BP69
63003 Clermont-Ferrand
FRANCE

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ABSTRACT

Cyclosporine A eye drops are used at concentrations ranging from 0.5 to 20 mg/ml to treat a variety of ophthalmic diseases. Cyclosporine A formulations at high concentrations are difficult to manufacture because of cyclosporine's lipophilicity, and generally require an oil based vector. In this study, we investigated the physicochemical and microbiological stability of two high concentrations (10 mg/mL and 20 mg/mL) of an ophthalmic Cyclosporine A micellar solution in a low density polyethylene multidose eyedropper, at two conservation conditions (5°C and 25°C), before and with simulated use. Analyses used were the following: visual inspection, Cyclosporine quantification by a stability-indicating liquid chromatography method, osmolality and pH measurements and turbidity. A complementary analysis by dynamic light scattering was implemented to evaluate potential particle formation or micelle size change. In the in-use study, cyclosporine quantification was also performed on the drops emitted from the multidose eyedroppers. Our results show that the cyclosporine micellar formulation retains good physicochemical and microbiological stability, as all parameters stayed within acceptable range limits, however a higher variability in Cyclosporine concentrations was observed for 20 mg/ml units stored at 25°C. The in-use study showed that Cyclosporine