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MICRO EMULSION FOR IMPROVED SKIN DELIVERY AND IN VIVO ANTI-INFLAMMATORY EFFECT

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We have designed a microemulsion (ME) containing Ketoprofen (KET) for anti-inflammatory effect evaluated using the rat paw edema model. The ME was prepared by adding propylene glycol (PG) loaded with 1% KET/water (3:1, w/w), to a mixture of sorbitan monooleate and polysorbate 80 (47.0%) at 3:1 (w/w) and canola oil (38.0%). The physicochemical characterization of KET-loaded ME involved particle size and zeta potential determination, entrapment efficiency, calorimetric analysis, and *in vitro* drug release. The *in vivo* anti-inflammatory study employed male Wistar rats. Measurement of the foot volume was performed using a caliper immediately before and 2, 4, and 6 h after injection of Aerosil. KET-loaded ME showed particle size around 20 nm, with zeta potential at -16 mV and entrapment efficiency at 70%. Moreover, KET was converted to the amorphous state when loaded in the formulation and it was shown that the drug was slowly released from the ME. Finally, the *in vivo* biological activity was similar to that of the commercial gel, but ME better controlled edema at 4 h. These results demonstrated that the ME formulation is an alternative strategy for improving KET skin permeation for anti-inflammatory effect. Furthermore, our findings are promising considering that the developed ME was loaded with only 1% KET, and the formulation was able to keep a similar release profile and *in vivo* effect compared to the commercial gel with 2.5% KET. Therefore, the KET-loaded developed herein ME is likely to have a decreased side effect compared with that of the commercial gel, but both presented the same efficacy.

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