In Vitro and In Vivo Anti-inflammatory Effects of Ricinoleic Acid Poloxamer Gel System for Transdermal Delivery
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Purpose
Pluronic lecithin organogels (PLO gels) have gained importance as transdermal drug delivery systems for the delivery of both hydrophilic and lipophilic drug molecules. Our previous study showed that the use of ricinoleic acid as an oil phase resulted in the formation of a stable PLO gel with better thixotropic properties and permeation of ketoprofen than the isopropyl palmitate PLO gel. The aim of this study was to evaluate and compare the in vitro and in vivo anti-inflammatory effects of ricinoleic acid PLO gel system with the isopropyl palmitate PLO gel.

Methods
PLO gels were prepared using ketoprofen (10%) as a model drug and characterized for pH, viscosity, and morphology. In-vitro anti-inflammatory activity and cell viability tests were performed using blank ricinoleic acid PLO and compared with the isopropyl palmitate PLO gel. In vivo anti-inflammatory activity of ricinoleic acid PLO containing ketoprofen was evaluated in a carrageenan-induced rat paw edema model.

Results
The pH and viscosity of ricinoleic acid PLO gel were comparable with the isopropyl palmitate PLO gel. The viscosities for the PLO gels containing isopropyl palmitate and ricinoleic acid at 20 rpm were found to be 47,800 cps and 49,050 cps, respectively. The in vitro anti-inflammatory effect exhibited by the blank ricinoleic acid PLO gel was significantly (p<0.05) higher than isopropyl palmitate PLO gel at 1 mM concentration, while both the gel formulations had no significant (p>0.05) cytotoxic activity. The ricinoleic acid PLO gel formulation was significantly more effective against edema formation than the isopropyl palmitate PLO gel.

Conclusion
The results observed in this study clearly indicate that the ricinoleic acid PLO gel is better than the isopropyl palmitate PLO gel.