In vitro In-vivo Investigation of Topical W/O Microemulsion of Timolol Maleate for Treatment of Glaucoma

Rahul R. HEGDE 1, Shiv S. BHATTACHARYYA 1, Anurag VERMA 1 & Amitava GHOSH 2

1 School of Pharmaceutical Sciences, IFTM University, Moradabad-244 102, Uttar Pradesh, India
2 Bengal College of Pharmaceutical Sciences & Research, Durgapur- 713 212, West Bengal, India

SUMMARY. The present study is focused in a w/o microemulsion formulation containing timolol maleate to extend the time of reduced intra-ocular pressure (IOP) of glaucomatous rabbit’s eye measured by using a Schiotz tonometer. The microemulsion composed of purified water, ethyl oleate as oil phase and two non-ionic surfactants, namely sorbitan mono laurate and polyoxyethylene 20 sorbitan monooleate. The colloidal system demonstrates monodisperse distribution behavior and exhibit a uniform size distribution of finite width. In vitro drug release was found to follow Higuchi’s pattern. Ex vivo permeation through goat cornea revealed delayed release of timolol from microemulsion as compared with its aqueous solution. A progressive reduction in IOP is seen lasting for 12 h compared to aqueous eye drop that lasted for only 5 h.

KEY WORDS: Ocular bioavailability, Phase transition, Timolol maleate, W/O microemulsion.

* Author to whom correspondence should be addressed. E-mail: rahulpharma@gmail.com