A novel nanovesicular carrier system for ocular delivery of clotrimazole

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Fungal Keratitis is a devastating disease that is responsible for corneal blindness. The limitations of the current therapeutic treatment of ophthalmic fungal infections are often due to poor bioavailability of antifungal agents in addition to the inability to provide long-term precorneal residence time.

The objective of the present investigation: was to explore the potential of novel vesicular nanocarriers for effective and sustained ocular delivery of Clotrimazole (CMZ). Vesicular nanocarriers were prepared using Span 60 and three types of edge activators. A 3^2 full factorial design was adopted to study the influence of the type of edge activator as well as the ratio of Span 60 to edge activator as independent variables. The particle size, entrapment efficacy and zeta potential of the developed nine formulations were selected as dependent variables.

Results: Results revealed that both the type of edge activator and ratio of Span 60 to edge activator had significant effects on the various physicochemical characteristics of the produced spanlastics ($p < 0.05$). The analysis of variance was used to optimize the properties of the prepared formulation. The prepared optimized formulation was spherical in shape, with average particle size of 500 nm, and of negatively charged surface (-32 mV) and high entrapment efficiency (89%). In vivo Draize test showed no signs of ocular toxicity.