Abstract—The purpose of the study is to formulate and evaluate proniosomal transdermal delivery systems for tolterodine tartrate besides undergoing in vitro and in vivo studies for treatment of overactive bladder syndrome. Method: Proniosomal gels are prepared using various non-ionic surfactants, lipids and soy lecithin via coacervation phase separation method. The formulations are evaluated for their drug entrapment efficiency, vesicles morphology and sizes as well as ATR-FTIR analysis. In vitro skin permeation study and in vivo animal studies are also been carried out to study the effectiveness of the formulations in treating overactive bladder syndrome. Results: Tolterodine tartrate is encapsulated in proniosomal vesicles with high yield of above 80% with Span formulations having the highest entrapment efficiency. In vitro skin permeation study shows concentration-dependent first order permeation of drug over 8 hours and is predicted to have a prolonged effect more than 8 hours. In vivo animal study of salivary secretion shows that proniosomal gel formulation of tolterodine tartrate has faster recovery of cholinergic effect on salivary gland than the oral formulation. In in vivo micturition studies, formulated proniosomal gel shows improved bladder function over those diseased without treatment. It is also found that Span formulation S1 has comparable effectiveness as oral formulation. Histological studies of the rats bladder shows improvement in the bladder morphology with proniosomal gel formulation S1 treatment over formulation S3. Conclusion: This study demonstrates the feasibility of using proniosomal vesicles as drug carrier for transdermal delivery of tolterodine tartrate with Span series being the better formulation.

Keywords—Proniosomes, transdermal delivery, tolterodine tartrate, permeation, cholesterol.