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In Vitro Drug Release Kinetics of Tramadol HCl-Ethocel Matrix Tablets and Studying the Effect of Co-Excipients on the Release Pattern

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***SUMMARY*. Preparation of matrix tablets with rate controlling polymers is the simplest and most widely used method for achieving desired controlled release rate of drugs. The objective of the present study was to evaluate the effect of concentration and particle size of Ethocel Premium 100P and 100FP and also the co-excipients like HPMC, starch and CMC on the release kinetics of Tramadol HCl from matrix tablets. For this purpose, different formulations of Tramadol HCl matrix tablets were prepared at various drug to polymer ratios by dry granulation method. Different physical and quality control tests were performed on the prepared tablets followed by *in vitro* drug release studies through USP method I dissolution test (rotating basket method). Different kinetic models were applied on the release profiles to determine drug release kinetics and release mechanism. Similarity factor f_2 and difference factor f_1 were applied for checking the similarities and dissimilarities between the release profiles. The results showed that Ethocel 100FP that have fine particle size than Ethocel 100P has a more retardant effect on the release profile, especially when the drug to polymer ratio was 10:4 which leads towards the achievement of anomalous non-Fickian release kinetics. The Co-excipients used in some formulations enhanced the release rate of TH from the matrix tablets.**

KEY WORDS: Controlled release drug delivery, Ethocel 100 fine particle premium (100FP), Ethocel 100 premium, Kinetic models, Similarity and difference factors, Tramadol HCl.

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