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# Mathematical Modeling of Drug Release of Novel Extended-Release Formulations of Tizanidine Hydrochloride

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***SUMMARY*. Six extended-release formulations of tizanidine hydrochloride were prepared by direct compression technique using hydroxypropylmethylcellulose (HPMC) and ethylcellulose (EC). The drug release from these tablets was evaluated by analyzing the samples at 227 nm. Both model dependent and independent mathematical approaches were applied to investigate the extended release pattern and mechanism of tizanidine hydrochloride. About 87.8, 74.4, 85.1, 74.8, 70.8, and 56.2 % drug was released from $F_1$ to $F_6$, respectively, in 12 h. Drug release kinetics indicated that drug release was best explained by Higuchi equation. The values of '*n*' from Korsmeyer-Peppas model (0.45 to 0.89) supported anomalous or non-Fickian diffusion in first five formulations, whereas last formulation ($F_6$) with '*n*' greater than 0.89 presented case-II relaxation or super case transport-II. In model independent approach, the values of first five formulations lies between 50 and 100, because of insignificant differences in their drug release whereas $F_6$ behaved differently. A retarding effect was observed with both of polymers depending upon their quantity. In $F_3$ and $F_5$ less retarding effect was observed than $F_2$ and $F_5$ because HPMC is hydrophilic and EC is hydrophobic polymer. When EC quantity increased, a decrease in release profile of tizanidine hydrochloride was observed.**

*KEY WORDS:* Ethylcellulose, Extended-release tablets, Factorial design, Hydroxypropylmethylcellulose, Kinetic models, Mathematical modeling, Tizanidine hydrochloride.

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