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Evaluation of the Kinetics and Mechanism of Piroxicam Release from Lipophilic and Hydrophilic Suppository Bases

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Abstract: Piroxicam rectal suppository offers an alternative in circumventing the side effects associated with oral administration of the drug. Predicting the release profile of piroxicam, a drug with limited aqueous solubility, from suppositories, would require an appropriate release kinetics model, which is dependent onthe formulation additives. The objective of this study was to determine the kinetics model that best describes the release of piroxicam from different suppository bases. Suppositories containing 20 mg piroxicam each were prepared in polyethylene glycol (PEG), cocoa butter and Witepsol® H15 and W35 bases by fusion method. Physical and dissolution properties of the suppositories were determined by appropriate methods. The dissolution data were fitted into five release kinetics models and three statistical criteria were used in selecting the most appropriate model. There was complete release of piroxicam from PEG bases, with more than 96.4 ± 6.0 % released within 60 min. Release of piroxicam from the lipophilic bases was poor, and in the order: Witepsol® W35 >Witepsol® H15 > cocoa butter, being significantly influenced by the hydroxyl values of the bases. The kinetics of Piroxicam released from lipophilic bases with or without Tween® 20 was best fitted into Korsmeyer-Peppas model with release exponents between 0.510 and 0.930, while that from PEG bases showed a biphasic pattern which was resolved by Kitazawa equation model.
Keywords: Piroxicam, suppository formulations, suppository bases, release kinetics models.

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