

Development and Characterization of Lamotrigine Rectal Drug Delivery for Treatment of Patients with Epileptic Attacks

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Abstract:

Background and Objectives: About 50 million people worldwide suffer from epilepsy of which almost 90% belong to developing countries. Although, the occurrence of epilepsy is uncertain, it is more likely to occur in young children or people above the age of 65 years. Lamotrigine (LTG) and Levetiracetam (LEV) are broad spectrum anticonvulsant drugs widely used as mono- or adjunct- therapy to treat partial seizures. Oral tablets of these two drugs are the only available dosage forms with limited bioavailability and difficulty to administer during epileptic Seizure. The aims of this study are to develop and characterize rectal suppositories of LTG and LEV to enhance the bioavailability and improve patient compliance.

Methodology: Fatty bases (Witepsol®, Suppocire® and Massa® different grades) and hydrophilic bases (PEG, different grades with different proportions) were used to prepare twenty-four suppository formulations regular and hollow (twelve formulations each) by fusion method and each containing 50 mg drug. The formulations were characterized for manufacturing defects, content and weight uniformity, mechanical strength, penetration time, disintegration time and *in vitro* drug release.

Results: The preparation method produced suppositories elegant in shape and free of physical deformities. The results of characterization were acceptable for both types of suppositories. Generally, hollow suppositories showed higher drug release compared with the regular ones. After 10 min, the majority of hollow suppository formulations showed more 90 % of drug release while the highest release with regular ones was 45.24%.

Conclusions: LTG was successfully prepared as regular and hollow rectal suppositories. Hollow type showed superior drug release compared to the regular ones and could be used for treatment of epileptic seizure as a potential alternative to the oral tablets.

Keywords:

Lamotrigine; Epileptic Seizure; Rectal Suppositories; Characterization.