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A liquid chromatography–electrospray ionization-tandem mass spectrometry method for the simultaneous quantitation of escitalopram and etizolam in human plasma

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In the present study an effective high performance liquid chromatography-tandem mass spectrophotometric (LCMS/MS) method was developed and validated for the simultaneous quantification of Escitalopram (ESC) and Etizolam (ETZ) in spiked human plasma. This is the first reporting method for this combination in human plasma. Risperidone is used as internal standard. Liquid-liquid extraction (LLE) method was adopted for the extraction of analytes from human plasma. Chromatographic separation was attained on a waters symmetry shield, C18 (4.6 mm id x 50 mm) analytical column using acetonitrile-solvent A 1% formic acid-solvent B (80:20, v/v) with a flow rate of 600 µl/min. The MS/MS experiment was performed in positive ion multiple reactions monitoring (MRM) to obtain the product ion m/z 325.15–108.99 for ESC, m/z 343.2–138.1 for ETZ and m/z 411.40– 191.30 for internal standard. The obtained calibration curve was linear over the range of 5 – 2000 ng/ml for both the analytes with r2 value more than 0.98 for both analytes. The developed method was shown excellent intra and inerday accuracy (% nominal 98 – 102%), precision (% CV ≤4.5%), matrix effect (Is normalized matrix factor ≤ 8.55), selectivity (% interference = 0) with an acceptable extraction recovery (92.75% - 98.80%) and stability (% nominal 98.40 – 101.4%) of different types. Method validation was performed as per US FDA guidelines for bioanalytical method development and validation and undoubtedly this first reporting bioanalytical method can be use for the pharmacokinetic, bioavailability and bioequivalence studies.

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Enhancing dissolution profile of lorazepam using hydrophilic polymers by solid dispersion technique

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The aim of the present study was to improve the solubility and dissolution rate of a poorly water-soluble drug by a solid dispersion technique, in order to investigate the effect of these polymers on release mechanism from solid dispersions. Lorazepam was used as a model drug to evaluate its release characteristics from different matrices. Solid dispersions were prepared by using polyethylene glycol 6000 (PEG-6000), HPMC, HPC and Poloxamer in different drug-to-carrier ratios (1:2, 1:4, 1:6, 1:8, 1:10). The solid dispersions were prepared by solvent method. The pure drug and solid dispersions were characterized by in vitro dissolution study. Distilled water was used as dissolution media, 1000 ml of distilled water was used as dissolution medium in each dissolution basket at a temperature of 37°C and a paddle speed of 100 rpm. The very slow dissolution rate was observed for pure Lorazepam and the dispersion of the drug in the polymers considerably enhanced the dissolution rate. This can be attributed to improved wettability and dispersibility, as well as decrease of the crystalline and increase of the amorphous fraction of the drug. SEM (Scanning electron microscope) studies show that solid dispersion having uniform dispersion. Solid dispersion was prepared using PEG-6000, poloxamer showed that the highest improvement in wettability and dissolution rate of lorazepam. Solid dispersion containing polymer prepared with solvent method showed significant improvement in the release profile as compared to pure drug lorazepam.

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