Stress degradation studies on betahistine and development of a validated stability-indicating assay method

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ABSTRACT

The purpose of this work was to study the stability of betahistine (BET) at different stress conditions and to develop a sensitive stability-indicating high-performance liquid chromatographic (HPLC) assay method. The stress conditions applied were including the effect of heat, moisture, acid–base, and ultra-violet (UV) light. Betahistine and its decomposition products were derivatized by reaction with dansyl chloride (Dan-Cl) and analyzed by HPLC equipped with fluorescence detector (FL) set at 336 and 531 nm as excitation and emission wavelengths, respectively. The drug was particularly labile at UV light and oxygen rich media. Two potential degradation products could be separated and identified by spectral methods. The chromatographic method involved Zorbax Eclipse XDB-C18 column kept at 30 ± 2 ºC and a gradient elution with mobile phase composed of acetonitrile and 0.02 mol L⁻¹ sodium acetate. The response factor of dansylated BET monitored by fluorescence detection was 32 times more than its UV response. The calibration curve of BET in bulk form was linear from 0.005 to 4.2 ng µL⁻¹. Intraday and interday precision were less than 0.04% (CV), and accuracy was between 99.2% and 100.9% over 2.0 ng µL⁻¹. The limit of detection was 0.002 ng µL⁻¹. The method was also validated for sample stability during reaction, robustness and selectivity. The method was applied for purity testing of betahistine in tablet form.

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