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High performance liquid chromatographic determination of buclizine dihydrochloride in the presence of acid-induced degradation products

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A literature review revealed few publications for the determination of buclizine dihydrochloride; a charge-transfer spectrophotometric method (ElWalily et al 1996), a potentiometric nonaqueous titration method (Zakhari et al 1991) and an improved TLC method for its identification (Tang 1987). None of these methods is stability indicating.

A simple , rapid, and precise liquid chromatographic method is now presented for the determination of buclizine dihydrochloride in the presence of its degradation products in tablets.

The kinetics of drug degradation at different temperatures was also studied. The assay was carried out using a 300 x 3.9 mm (i.d.) stainless-steel column packed with Waters Bondapak C18 (10 μm) at ambient temperature, a mobile phase consisting of acetonitrile-water (85 : 15) containing 0.5% triethanolamine at pH 6.6, filtered through 0.45-μm membrane filter and degassed by vacuum, a flow rate of 2 mL min^{-1} and detection at 260 nm.

Acid induced degradation products were obtained by refluxing buclizine dihydrochloride in 0.1M hydrochloric acid for 70 h in a water bath. The chloroform extract of the alkalinized solution containing the basic degradation products was evaporated to dryness under vacuum without heat. Analysis by TLC revealed four spots with Rf values of 0·15, 0·71, 0·82, and 0·88; the Rf for buclizine was 0.84. The HPLC traces also showed four peaks at $1{\cdot}5 \pm 0{\cdot}003$, $1{\cdot}9 \pm 0{\cdot}003$, $2{\cdot}3 \pm 0{\cdot}007$, and $3{\cdot}6 \pm 0{\cdot}047$ min, and at $5{\cdot}7 \pm 0{\cdot}08$ min for the parent compound (15 replicates). These results indicated that the system was specific for buclizine. Linearity of the detector response using both peak height and peak area was verified over the concentration range 80–320 pg mL^{-1}; r = 0.9999. Accuracy was checked and the mean percentage recovery was found to be $99{\cdot}8 \pm 0{\cdot}25\%$ using peak area and $100{\cdot}0 \pm 0{\cdot}23\%$ using peak height for mixtures of buclizine dihydrochloride with its degradation products (n = 7). Using laboratory-prepared tablets, the mean percentage recovery was found to be 99.9 0.28% (n = 6). The repeatability of the method was tested and the relative standard deviation was found to be 0.25%.

Laboratory-made tablets containing buclizine dihydrochloride, 50 mg and nicotinic acid, 25 mg per tablet were analysed by the method and the mean percentage recovery was found to be $100{\cdot}0 \pm 0{\cdot}17$ (n = 6).

At selected temperatures (95, 90, 85, 80, 75°C), the degradation of buclizine dihydrochloride in 0.1M hydrochloric acid was found to be first-order kineties. Plotting log K values versus 1/T, an Arrhenius plot was obtained, linear over the temperature range 95–97°C. The activation energy was calculated to be 41.86 kcal mol^{-1}.

El-Walily, A., El-Gindy, A., Wahbi, A. A. (1996) Spectrosc. Lett., 29(2): 217–230

Tang, S., (1987) Yaoxue-Tongbao, 22 (5): 292–293

Zakhari, N. A., Ahmed , S. AL, Kovar, Y- A.(1991) Pharmeuropa, 3(4): 269–273