ORIGINAL ARTICLE

Optimization of a micro-high-performance liquid chromatography method for determination of metronidazole benzoate in their standard powder and in dosage pharmaceuticals

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HIGHLIGHTS

- A new method of estimating MET in pharmaceuticals.
- Use of HPLC-UV technology for LC100 in the estimation of MET.
- Study the structural synthesis of MET in the neutral, acidic and base.
- Studying the relative stability of MET during the experimental estimation process.
- Perform different applications for the purpose of validating the chromatographic method in the estimation of MET.

Abstract

Context: In this manuscript, a high-performance liquid chromatography (HPLC) method for the determination of metronidazole in pharmaceuticals was described and developed. **Methods:** The reversed-phase HPLC (RP-HPLC) method was developed and the results obtained to determine the form of metronidazole. Chromatographic analysis was performed in HPLC-ultraviolet (HPLC-UV) system with Ion Pac column; Arcus EP-C18; 5 µm, 4.6 mm× 250 mm, with acetonitrile: triethylamine 30:70 (v/v)+0.5 M potassium dihydrogen orthophosphate buffer at pH 4.5 as mobile phase, at a flow rate of 1.0 ml/min. UV detection in HPLC system was performed at 310 nm. **Results:** The method was validated for accuracy, precision, specificity, linearity, and sensitivity. The retention time for the metronidazole was 9.9 min. Calibration plots were linear over the concentration ranges 1–5 µg/L for the metronidazole. The limit of detection was 0.115 µg/ml and the limit of quantitation was 0.437 µg/ml. The accuracy of the proposed method was determined by recovery studies and found to be from 93.3% to 100%. **Conclusion:** Commercial tablet formulation was successfully analyzed using the developed HPLC-UV method that has been validated; accuracy, precision, and specificity were found to be within the acceptable limits. Moreover, results obtained by the suggested methods showed no significant difference between the results obtained from the suggested method.

Key words: Detection limit, metronidazole drug, micro-high-performance liquid chromatography, quantification limit, statistical analysis

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