Synchronized separation of seven medications representing most commonly prescribed antihypertensive classes by using reversed-phase liquid chromatography: Application for analysis in their combined formulations

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Abstract

A reversed-phase high-performance liquid chromatography method was developed for the simultaneous determination of the diuretic, hydrochlorothiazide, along with six drugs representing the most commonly prescribed antihypertensive pharmacological classes such as atenolol, a selective β1 blocker, amlodipine besylate, a calcium channel blocker, moexipril hydrochloride, an angiotensin-converting-enzyme inhibitor, valsartan and candesartan cilexetil, which are angiotensin II receptor blockers, and aliskiren hemifumarate, a renin inhibitor, using irbesartan as an internal standard. The chromatographic separation was achieved using acetonitrile/sodium phosphate dibasic buffer (0.02 M, pH 5.5) at a flow rate of 1 mL/min in gradient elution mode at ambient temperature on a stationary phase composed of an Eclipse XDB-C18 (4.6 × 150 mm, 5 µm) column. UV detection was carried out at 220 nm. The method was validated according to ICH guidelines. Linearity, accuracy, and precision were satisfactory over the concentration ranges of ±2–40 µg/mL for hydrochlorothiazide and candesartan cilexetil, 20–120, 10–160, 5–40, 20–250, and 5–50 µg/mL for atenolol, valsartan, moexipril hydrochloride, aliskiren hemifumarate, and amlodipine besylate, respectively. The method was successfully applied for the determination of each of the studied drugs in their combined formulations with hydrochlorothiazide. The developed method is suitable for the quality control and routine analysis of the cited drugs in their pharmaceutical dosage forms.