Prevalence and characteristics of medication non-adherence assessed by quantitative liquid chromatography-tandem mass spectrometry in patients with hypertension

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Background/Introduction: Antihypertensive medication screening by qualitative high performance chromatography-tandem mass spectrometry (LC-MS/MS) has recently become available to detect non-adherence to antihypertensive treatment. Because the result of this test is dichotomous (the drug is detected or not), it may incorrectly classify patients who take their medications infrequently. Therefore, a quantitative screening method has been developed to improve detection of non-adherence.

Purpose: The aim of this study was to determine the prevalence of medication non-adherence assessed by quantitative LC-MS/MS in referred hypertensive patients. In addition, we determined to what extent clinical characteristics, prescribed medication and self-reported perspectives, were associated with medication non-adherence assessed by quantitative LC-MS/MS.

Methods: In this cross-sectional study we included 197 newly referred hypertensive patients (mean age 56 ±14 years, 101 women, mean 24-hour ambulatory blood pressure 143/85 ± 21/12 mmHg) prescribed at least one antihypertensive drug. Medication adherence was assessed by quantitative LC-MS/MS in plasma. The concentration of each prescribed drug (or its metabolite) was measured and divided by the literature-based population trough concentration, to get the concentration ratio (CR). If the CR of at least one of the prescribed drugs was ≥0.3 the patient was categorized as non-adherent: completely non-adherent if all were ≥0.3, partially non-adherent if not all were ≥0.3. Logistic regression analysis was performed to determine the association between clinical characteristics, prescribed medication and self-reported compliance (Hill & Bone), relational empathy (CARE) and beliefs about medicines (BMQ), and medication non-adherence.

Results: 29% was classified as partially non-adherent and 10% as completely non-adherent. Non-adherence to calcium antagonists (30%) and beta blockers (24%) prevailed non-adherence to other antihypertensive medication classes (6-11%). The odds of non-adherence were higher in patients with apparent resistant hypertension and increased with the number of antihypertensive medication types, tablets and daily defined dose prescribed (Figure 1). Combination pills were inversely associated with non-adherence. Self-reported measures were not associated. Older age was negatively associated with non-adherence to RAS inhibitors (OR 0.60, 95% CI 0.36-0.96) and beta blockers (OR 0.50, 95% CI 0.30-0.77).

Conclusions: Quantitative screening by LC-MS/MS in plasma shows a high prevalence of non-adherence in referred hypertensive patients, particularly for calcium antagonists and beta blockers. The observation that clinical characteristics and self-reported perspectives about medical treatment were not associated with non-adherence, supports the use of quantitative LC-MS/MS to detect non-adherence to antihypertensive medication in daily practice.
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