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Simultaneous extraction and determination of four different groups of pharmaceuticals in compost using optimized ultrasonic extraction and ultrahigh pressure liquid chromatography–mass spectrometry

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The simultaneous extraction and determination of different groups of pharmaceuticals in complex environmental matrices such as compost is particularly challenging because of the low detection limits required, the complex nature of the samples, the different chemical characteristics of the pharmaceuticals, and the difficulty in extracting and separating these compounds from interference. Thus, the aim of this study was to develop and validate a reliable and affordable analytical method for the simultaneous extraction and determination of four different groups of pharmaceuticals in compost obtained from the thermophilic aerobic treatment of placenta. The pharmaceuticals were two non-steroidal anti-inflammatory drugs, ketorolac and naproxen, usually administered to humans; two fluoroquinolones, ofloxacin and ciprofloxacin (which are among the most commonly prescribed class of antibiotics in Mexico); two anti-cancer (antineoplastic or cytotoxic) chemotherapy drugs, ifosfamide and cyclophosphamide; and two β-blockers, atenolol and propranolol, also called β-adrenergic blocking agents, which treat a variety of conditions, such as high blood pressure, glaucoma and migraines. The pharmaceuticals of each group were selected because they are commonly used in Mexico and environmental and health impacts have been reported. The clustering was based on the use of the drug and not on the similarity of the structure. Recovery values of the ultrasonic extraction for all compounds were on the order of 87% to 113%. The limits of detection and quantification for the eight pharmaceuticals were on the order of 0.66 ng g^{-1} and 2 ng g^{-1} respectively for all the pharmaceuticals analyzed. These values are lower than those values reported in the literature.

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QTc-prolonging drugs: Every day clinical practice in Saudi Arabia

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Different classes of widely used drugs tend to induce QTc-prolongation and associated arrhythmias with high risk of sudden death. The aim of the present study is to describe the routine every-day clinical practice of QTc-prolonging drugs in Saudi Arabia. Quantitative descriptive cross-sectional study was developed. A valid questionnaire was distributed to healthcare professionals recruited from healthcare institutions. The questionnaire included baseline demographics section, most frequently used drugs section and a third section covering five outcomes (i) ECG monitoring before prescription of QTc-prolonging drugs, (ii) effect of QTc-prolongation on drug choice decisions, (iii) role of the institution, (iv) counseling provided to patients, and (v) estimation of QTc-prolongation as an increasing public health problem. Univariate and multivariate regression analyses were used to identify factors associated with better clinical practice. In total, 298 healthcare professionals completed the questionnaire. Drug choice decisions as avoiding co-administration of two drugs affecting QTc-interval and disregarding drug of choice if it causes QTc-prolongation were the most addressed outcomes by healthcare professionals with (mean±SD) 3.28±1.33 and 2.96±1.38, respectively, while, counseling patients by providing a list of symptoms that are associated with QTc-prolongation was the least addressed outcome (2.39±1.36). Older healthcare professionals and those who were working in private institutions were more likely to provide better clinical practice (odds ratios [95%CIs] 1.64[1.40, 1.92] for age 31-40 years, 31.97 [1.64, 2.37] for age >40 years, and 2.65[2.26, 3.12] for private institutions). Special recommendations should be raised to healthcare professionals dealing with these drugs.

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Page 51