



Área: ANA

Evaluation of a Miniaturized Technique for the Determination of Xenobiotics in Human Placental Tissue

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Highlights

Micro-QuEChERS method and GC-MS/MS enables fast and eco-friendly sample preparation for xenobiotics determination in human placental tissue samples. High selectivity and sensitivity at trace levels.

Abstract

Humans are continuously exposed to organic contaminants, including xenobiotics. Among these, compounds such as pesticides, pharmaceuticals, and personal care products are of particular concern. Endocrine-disrupting chemicals stand out within this group, as their effects can range from transient alterations in adults to permanent developmental changes when exposure occurs during critical life stages, such as pregnancy and childhood. In this sense, human placental tissue represents a strategic matrix for biomonitoring maternal-fetal exposure and considering the analytical challenges the sample preparation it's necessary [1]. In this context, this study proposes the development, optimization, validation and application of a micro-QuEChERS method, followed by GC-MS/MS, for the thirteen xenobiotics determination in human placental tissue. This method offers advantages such as reduced sample and solvent consumption, waste generation, time, and the low cost. The study is conducted in partnership with the Virology and Immunology Center of Faculdade de Medicina (FAMED - FURG and has ethical committee approval (CEPAS 54/2011). The micro-QuEChERS method will be standardized based on conventional QuEChERS versions [2-3], where different sorbents obtained from renewable sources will also be evaluated to compare extraction efficiency [4]. The validation step will follow the guidelines of FDA [5], evaluating linearity, limits of detection, limits of quantification, accuracy, repeatability, intermediate precision, and matrix effect. Until now, analytes presented retention times between 5.86 and 9.32 minutes and the compounds were detected with good chromatographic resolution and characteristic fragmentations. This study aims to generate highly relevant scientific data, related to human health, on the potential presence of xenobiotics in placental tissue. Furthermore, the results are expected to serve as a solid basis for the creation of a database, enabling future monitoring of children already born now adults to verify whether they developed diseases related to exposure to these compounds. This information is expected to provide fundamental support for deeper discussions on the impacts of xenobiotic contamination on human health.

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[4] Chen et al. **Food Chemistry**. 2022, v. 388, p. 132929.

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