



Tracking mycotoxin exposure in Portugal: New insights and key determinants

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Abstract

Human biomonitoring (HBM) is a vital tool for assessing exposure to environmental chemicals. Mycotoxins have been associated with various adverse health effects, including estrogenic, immunotoxic, nephrotoxic, and teratogenic outcomes. In this presentation an overview of two recent HBM studies on multiple mycotoxins exposure biomarkers conducted in Portugal will be given. The first study analyzed 37 mycotoxin biomarkers in urine samples from 94 adult participants (48.4 ± 15.2 years), as part of the National Food, Nutrition, and Physical Activity Survey (2015–2016). Six different mycotoxins -DON, ZEN, AOH, OTA, FB1, and CIT- was confirmed through the quantification of 12 urinary biomarkers in paired 24 h and first-morning urine samples. DON and its metabolites were among the most frequently detected biomarkers and AOH was identified for the first time in urine samples from a European population. Associations between urinary mycotoxin biomarkers and consumption of specific food items were also observed. More recently, a subset of 295 first-morning urine samples from adults (28–39 years) was collected between 2019-2020, as part of a cross-sectional study embedded within the Portuguese National Health Examination Survey (INSEF). These samples were analyzed using a newly optimized and validated LC-MS/MS method capable of detecting 40 mycotoxins and/or their metabolites in urine. DON and tenuazonic acid were the most frequently detected, with detection rates of 85% and 96%, respectively. Further investigations into key exposure determinants—including dietary habits, demographic factors, and geographical variations—are ongoing and will be presented. Altogether, these findings highlight the importance of continued surveillance and the integration of HBM into national food safety and public health strategies.

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