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ID 3035. Monitoring Respiratory Viruses and Antibiotic Resistance Genes in Wastewater: Insights Beyond COVID-19

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Introducción y Objetivo/Background and objectives

Wastewater-based surveillance can be a valuable tool to monitor viral circulation. For respiratory viruses that share similar clinical symptoms, namely SARS-CoV-2, influenza, and respiratory syncytial virus (RSV), identification in wastewater may allow differentiation between seasonal outbreaks and COVID-19 peaks. Also, antimicrobial resistance is an increasing global concern, having drastic consequences that affect human health but also productivity and food security. In this study, to monitor these viruses as well as antibiotic resistance genes (ARGs), a weekly sampling campaign was carried from January 2021 to February 2023 in a wastewater treatment plant that serve the entire population of Córdoba (Spain).

Métodos/Methods

Wastewater samples were collected weekly from La Golondrina WWTP and concentrated within 24 hours using an aluminum hydroxide adsorption-precipitation method. Later, RNA and DNA extractions were performed for each WWTP concentrate and quantified through RT-qPCR. For absolute quantification of the viruses and antibiotic resistance genes (ARGs), standard curves were elaborated using PCR products.

Resultados/Results

A total of 78 wastewater samples were analyzed, of which 80,7% tested positive for SARS-CoV-2, 66,7% tested positive for influenza A (IAV) and 43,6% tested positive for RSV. Additionally, all 78 DNA samples tested positive for the presence of the *sul1*, *sul2*, *qnrS*, *tetM* and *blaTEM* antibiotic resistance genes with a certain degree of seasonality.

Conclusión y Relevancia/Conclusions and relevance

This study has provided significant data on the presence and evolution of respiratory viruses in the city of Córdoba, revealing different epidemiological patterns to those before the COVID-19 pandemic. On the other hand, this work can help establish baselines for communal AMR status, providing community-wide surveillance and evidence for informing public health interventions. Overall, the integration of data on respiratory virus dynamics and AMR in an environmental context is essential for understanding the long-term impact of the pandemic and developing more effective strategies to address future zoonotic threats and global public health challenges.