The contribution of pharmaceutical industries and poultry farms for spreading antibiotic residue in the environment (Water and Soil): a potential health risk

Fatema Akter Mahua1*, Md. Tajuddin Sikder1, Mohammed A. Samad2

1Department of Public Health and Informatics, Jahangirnagar University, Savar, Dhaka, 1342
2Antimicrobial Resistance Action Center (ARAC), Animal Health Research Division, Bangladesh Livestock Research Institute (BLRI), Savar, Dhaka-1341

*Presenting and corresponding author: fatema.mahua@gmail.com

Background

Antibiotics are biologically active compounds designed to kill bacteria or inhibit their growth1. Although antibiotics are considered as an essential factor for human health, its existence in the environment is worrisome. Pharmaceutical industries and poultry farms are both regarded possible sources of residual antibiotics in the environment.

Objectives

➢ To determine the prevalence of antibiotic residues in water and soil samples from pharmaceutical industries and poultry farms in Savar and Dhamrai Upazila.
➢ To assess the concentration of antibiotic residues in same samples

Methods

A cross-sectional study was carried out during January to December 2020 at Dhamrai and Savar Upazila, Dhaka. A total of 127 different samples from both sources were collected. The antibiotics tested for residue namely ciprofloxacin, tetracycline, oxytetracycline, meropenem, azithromycin, ceftriaxone, cefuroxime and clindamycine. HPLC with a DAD detector, C-18 column, and solid-phase cartridges were used to analyze antibiotic residues.

Results

Highest identified antibiotics in F, P and R

Highest concentration of antibiotic in F, P and R

Correlation of antibiotic residues (mg/l) among farm, pharmaceuticals and river samples

Correlation of antibiotic residues (mg/l) among poultry farm samples

Correlation of antibiotic residues (mg/l) among pharmaceuticals samples

Conclusion

The presence of antibiotic residues in the water and soil samples lead to antibiotic resistant strains that is greatly worrisome to public health. Antibiotic contamination in different matrices of poultry farms, pharmaceutical industries and rivers in different areas and seasons needs to be quantified