Impact of pharmaceutical toxicity on the environment and its regulatory aspects

K. Venkateswara Raju, T. Harini, V. Akshaya Ratna Kireeti, A. Sai Priya and Lakshmi Prasanthi Nori*

Department of Regulatory Affairs, Shri Vishnu College of Pharmacy, Bhimavaram 534 202, India

Pharmaceutical-induced environmental contamination demands urgent attention, with around 43% of global rivers facing risks from active pharmaceutical ingredients (APIs). The entire spectrum of pharmaceutical products, including active and inactive components, requires serious consideration due to continuous emissions and potential hazards to the environment and human health. Discussions on chemical waste reduction face limitations due to incomplete knowledge about their toxicity to humans. Despite various initiatives, collaboration evidence is minimal, and environmental health disparities persist in socially disadvantaged communities, leading to higher disease rates. While awareness of ecotoxicity is growing, the European Union (EU), United States (US) and Canada have taken steps, including disposal procedures, prevention strategies, and focus on concerns like antimicrobial resistance. This article explores environmental pollution complexities and policies in US, EU and Canada to mitigate its impact within health disparities.

Keywords: Antimicrobial resistance, drug residues, environmental toxicity, green prescription, pharmaceutical pollutants.

PHARMACIES sometimes cannot fill [illegible] each year; this number may be lower now. Most countries have done little to combat this serious public health crisis. Although high-income countries manage the worst forms of pollution and link pollution control to climate change, only a handful of low- and middle-income countries have made pollution a priority, are committed to it, or have made progress regarding pollution control. Also, pollution control has received little attention from development or international aid. Pollution, climate change and biodiversity loss are interrelated, and solving any of them will benefit others. Thus environmental pollution cannot be ignored.

Causes of pharmaceutical pollution

(1) Drug ingestion and excretion: When organisms consume pharmaceuticals, their bodies metabolize and excrete inactive metabolites as waste products, eventually finding their way into the environment through urine and faecal matter.

(2) Healthcare institutions disposal: Hospitals and healthcare facilities contribute significantly to pharmaceutical pollution due to inadequate disposal practices or contraventions in rules and regulations of standards[1].

(3) Drug manufacturing units: Some drug manufacturers dispose of excess drugs [illegible]