Smith, Drug Intox Detox: Novel Approaches 2012, 1:1
http://dx.doi.org/10.4172/2327-4557.1000e103

Drug Intoxication & Detoxification: Novel Approaches

Editorial

A SCITECHNOL JOURNAL

Drugs and the Environment: A Call for Change in Drug Dispensing Practice

Timothy J Smith[1*]

[1]*Department of Physiology and Pharmacology, University of the Pacific, USA*

Recent studies noting the appearance of drugs in several environmental water sources have generated public concern and scientific inquiry into the best approaches for reducing the presence of drugs in these sources. In many cases, the concentration of drugs found in these water sources are several orders of magnitude below what would reasonably be considered toxic, even when accounting for the potential synergistic effects among several drug classes identified in these studies [1]. Unfortunately, there is significant variation in the concentration of environmental drugs; especially when considering water sources that are close to wastewater treatment plants or landfills. While potentially lifelong exposure to these agents at trace levels has unknown consequences, exposure to other toxic agents in the diet and environment superimposed upon these drug exposure sources clearly makes interpretation of risk very difficult. Several environmental species in surface water are highly sensitive to the endocrine disruptive effects of drugs; these changes have been identified in close association with wastewater treatment facilities [2]. The detection of drugs in these water sources is possible through advanced analytical capabilities that would be considered revolutionary three decades ago. These points are made not to reduce or increase concern, but to bring into focus the complexity of the problem and vigilance necessary to assure the implementation of appropriate environmental health measures. As non-potable water from wastewater sources is used to sustain landscape vegetation, monitoring of drug persistence, accumulation and the potential for biomagnification increases in importance. These concepts rise to greater significance when considering the recycling of wastewater for human consumption. It is virtually impossible, if not prohibitively expensive and impractical with current technology to remove all drugs from the global water supply. Introduction of xenobiotic drugs through the practice of human and veterinary medicine will guarantee that active drugs and their metabolites are eliminated through fecal and urinary routes into wastewater. Reducing the introduction of unused drugs into water systems has a greater chance of success. Drug "take back" programs have been an important first step in this process. Reliance upon the genuine concern and goodwill of the public to follow through is not always predictable. In view of these circumstances, the following interventions may be appropriate, but are not without controversy: 1) A financial incentive for prescription drug and OTC drug recovery, analogous to the recycling of glass, plastic, aluminum and other metals, could be implemented. This may involve a rebate for unused medications (in original containers) returned to pharmacies for appropriate disposal and a mechanism for financial support to these pharmacies through surcharges to sustain this effort. 2) Elimination or restriction of prescription refills can reduce the "automatic" increase in unused drugs and their introduction into the environment. While this will increase the workload of physician offices and pharmacies, it will provide a genuine opportunity for more meaningful therapeutic monitoring, as well as reduction in environmental drug levels. This therapeutic monitoring must be realized by the patient as a benefit, especially since they must experience an inconvenience. 3) Advanced filtration and other remediation technologies will need to be assessed for removing drugs from recycled wastewater. The improved analytical capabilities that have been used to identify the problem will be needed for monitoring the solution.

References

1. Bruce GM, Pleus RC, Snyder SA (2010) Toxicological Relevence of Pharmaceuticals in Drinking Water. Environ Sci Technol 44: 5619-5626.

2. McAvoy K (2008) Occurrence of Estrogen in Wastewater Treatment Plant and Waste Disposal Site Water Samples. Clearwaters: Contaminants of Emerging Concern 38: 28-34.

***Corresponding author:** Timothy J Smith, R.Ph., Ph.D, Department of Physiology and Pharmacology, University of the Pacific, USA, Tel: 209.946.3168; E-mail: tsmith@pacific.edu

Received: June 12, 2012 **Accepted:** June 13, 2012 **Published:** June 15, 2012