

Opinion

Exposure of Endocrine Disrupting Chemicals: A Growing Public Health Concern in Faisalabad, Pakistan

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Endocrine disrupting chemicals (EDCs) are gradually documented as public health hazards in agricultural and industrial centers of Pakistan. Faisalabad, is known as a major pivot point for intensive farming and textile manufacturing, presents multiple sources of exposure including industrial effluents, pesticide residues, and consumer products. However, the exposure of EDCs at population level leftovers under-addressed. The data documented in this study was collected from recent environmental and biomonitoring studies conducted in Punjab, Pakistan. For this purpose, we reviewed literature on EDCs concentrations in food items, groundwater, and biological samples, with special focus on bisphenol A (BPA), organochlorine pesticides, and phthalate metabolites. In conclusion, Faisalabad's polluted groundwater supply, convergence of dyeing industry effluents, and pesticide-intensive agriculture create a significant risk of low dose, chronic exposure to various EDCs which are associated with metabolic disorders, warranting urgent public health interventions.

Keywords: Endocrine disrupting chemicals (EDCs); environmental exposure; pesticides; bisphenol A; phthalates; Faisalabad; Pakistan

The emerging evidences underscore the major health risks related to endocrine disrupting chemicals (EDCs) in industrial and urban areas of Punjab, Pakistan. Faisalabad, a major industrial hub for intensive agriculture and textile manufacturing presents various pathways for exposure of EDCs at community level.⁽¹⁾ There are various sources which are documented in previous studies include industrial effluents, agriculture runoff and dyeing units containing phthalates, pesticide residues and alkyl-phenols respectively.⁽²⁾ Recent environmental studies and biomonitoring studies conducted in Pakistan have reported detectable amount of bisphenol A (BPA), phthalate metabolites and organochlorine pesticides in food items, groundwater, urine samples and human serum.⁽³⁾ For example, Razzaque et al. reported a detectable amount of phthalates and BPA in fruit juices marketed in Pakistan,⁽⁴⁾ while Ali et al. detected the contamination of organochlorine pesticide in groundwater across province Punjab of Pakistan.⁽⁵⁾ Furthermore, Aslam et al. also documented a detectable concentration of phthalate metabolites in urine samples from the general population in Pakistan, exhibiting a consistent exposure of EDCs on human population.⁽⁶⁾ These chemicals interfere with various endocrine pathways at environmentally relevant doses and have been epidemiologically associated with thyroid dysfunction, reproductive abnormalities, neuro-developmental deficits and metabolic disorders.^(7,8)

Owing to Faisalabad's high population density, widespread industrial setup, inadequate waste management

resources and an extensive trust on untreated groundwater, the chronic low-dose exposure can be substantial. Furthermore, the warm temperature of Faisalabad city in summer also supports the migration of these lethal chemicals from plastics. Sometimes, the exposure of EDCs is also underreported due to the below detection limits of conventional testing procedures. Therefore, I advocate for a better regulatory oversight of industrial effluents, enhanced implementation of proper pest management to decrease pesticide burden, public health awareness on reducing EDCs exposure and routine environmental surveillance. Addressing of EDC exposure is very significant in order to reduce chronic disease burden, especially among susceptible subpopulations such as children and pregnant females.

Ethical Approval

Not required.

Competing Interests

All the authors declare that there are no conflicts of interest.

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