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Commentary

The Impact of Endocrine Disruptors on Infant Health

Ahan Zahra*

Department of Anatomy, University of Toronto, Toronto, Canada

DESCRIPTION

Endocrine disruptors (EDs) are chemicals that are either natural or synthetic and cause changes in the body's hormonal and homeostatic systems. These chemicals are more likely to harm children, particularly developing fetuses and infants, than adults. Food consumption is one of the most common ways for EDs to enter the body. While some foods naturally contain EDs, synthetic EDs primarily contaminate food, including breast milk and water. Although safe doses for many EDs have been reported, this issue may be contentious due to low-dose effects and non-monotonic dose responses of EDs. Because of their epigenetic effects, their effects may be passed down to subsequent generations who have not been directly exposed. Some EDs persist in the environment. Water is used to transport these chemicals.

Endocrine disruptors (EDs) are substances, either natural or synthetic, that can cause changes in the hormonal and homeostatic systems of organisms exposed to their action. Due to the presence of a phenolic moiety, some EDs are thought to mimic natural steroid hormones and interact with their receptors as analogues or antagonists. As a result, they can act as estrogens, androgens, and antiandrogens. They may also act as thyroid hormone receptor agonists and antagonists.

The developmental age at which an endocrine disruptor is exposed is critical. When exposed to a presumed "safe" dose during a life stage such as the intrauterine period, when there is no endogenous hormonal exposure, the potential effects of exposures at very low doses should be considered. Furthermore, there is evidence that very low ED doses may be more effective than higher doses, and no monotonic dose responses are not uncommon when EDs are studied.

Endocrine disruptors enter the body primarily through three routes: inhalation, ingestion, and cutaneous absorption. Some EDs are not metabolized and stay in high concentrations in the environment for an extended period of time; they are referred to as persistent organic pollutants (POPs).

As a result, EDs that were outlawed decades ago can still be discovered in human and animal bodies. Some, on the other hand, can transform into much more dangerous substances and be detected at great distances from where they were made or discharged.

These compounds are delivered into the food chain by water and air currents, as well as migratory animals. Others, such as BPA, do not persist in the environment for very long yet are widely used. Individuals may be exposed to many EDs at the same time, and while the individual components at acceptable levels have no effect on physiology or homeostasis, they create synergistic effects when consumed together is known as the "cocktail effect."

This is due to increased ligand binding affinity and recruitment of transcriptional coactivators. Transnonachlor (TNC), a prohibited organochlorine insecticide, and 17-ethinyl estradiol, for example, can bind to the same nuclear receptor (pregnane X receptor-PXR) with up to 100-fold more affinity than the separate substances.

This synergistic activation modifies the regulation of multiple physiological activities, whereas the individual impacts of the individual components would be minimal. The major natural endocrine disruptors present in human and animal diet are phytoestrogens.

Genistein is a phytoestrogen found in soybeans naturally.

Urine genistein concentrations in newborns fed soy formula were found to be around 500 times greater than in those fed cow formula. This chemical binds to oestrogen receptors and is also goitrogenic. There is also evidence of a link between soy newborn formula and autoimmune thyroid illness.

Correspondence to: Ahan Zahra, Department of Anatomy, University of Toronto, Toronto, Canada, E-mail: Ahanzahra142@gmail.com

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