

Endocrine Disrupting Chemicals: Slow Poison or Dooshivisha

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Abstract: *Endocrine Disrupting Chemicals (EDCs) are synthetic or natural substances that interfere with the endocrine system by mimicking, blocking, or altering hormonal signaling. Exposure to EDCs has been linked to reproductive, metabolic, neurological, and carcinogenic outcomes in humans and wildlife. This study reviews recent literature to identify the primary sources, mechanisms, and health implications of EDC exposure. A narrative review of peer-reviewed journals, health agency reports, and regulatory documents was conducted. The findings indicate that EDCs are prevalent in plastics, pesticides, cosmetics, and industrial waste, posing global health and ecological challenges. Recommendations include stricter regulations, enhanced consumer education, and further research on low-dose and combined exposure effects.*

Keywords: Ayurveda, Endocrine disrupter chemicals, Dooshivisha

1. Introduction

The endocrine system regulates vital physiological processes, including growth, metabolism, reproduction, and development, through the secretion of hormones. Disruption of this delicate hormonal balance can have severe and long-term consequences. Endocrine Disrupting Chemicals (EDCs) are exogenous substances that interfere with hormone synthesis, secretion, transport, metabolism, binding, or elimination, thereby altering normal endocrine function [1].

Common EDCs include bisphenol A (BPA), phthalates, parabens, polychlorinated biphenyls (PCBs), and certain pesticides such as DDT and atrazine. These chemicals are found in plastics, personal care products, industrial waste, and agricultural runoff. EDCs can bioaccumulate in organisms and persist in ecosystems, resulting in widespread exposure [2].

The increasing prevalence of endocrine-related disorders, such as infertility, thyroid dysfunction, obesity, and hormone-dependent cancers, has heightened concern regarding EDC exposure [3].

This paper aims to review the current state of knowledge of EDCs, focusing on their sources, mechanisms of action, and associated health implications in relation to dooshivisha of Agadatantra, a branch of Ayurveda.

2. Methods

- 1) A narrative literature review was conducted to synthesize available data on EDCs and their effects. Electronic databases including PubMed, ScienceDirect, and Google Scholar were searched using keywords such as "endocrine disrupting chemicals," "hormone disruption", "bisphenol A," "phthalates," and "environmental exposure."
- 2) Ayurvedic Classical texts were also referred for the same.

3. Results

1) Sources of exposure [4]:

EDCs originate from multiple environmental and consumer sources.

- a) **Industrial chemicals:** Polychlorinated biphenyls (PCBs) and dioxins released during manufacturing and waste incineration.
- b) **Plastics:** Bisphenol A (BPA) and phthalates used as plasticizers in packaging, food containers, and toys.
- c) **Agricultural products:** Pesticides such as DDT, atrazine, and organophosphates used for crop protection.
- d) **Personal care products:** Parabens and triclosan found in cosmetics, shampoos, and soaps. Human exposure occurs through ingestion, inhalation, dermal contact, and maternal transfer via the placenta or breast milk.

2) Mechanisms of Disruption [5]:

EDCs disrupt the endocrine system through several pathways:

- a) **Hormone mimicry:** Some chemicals imitate natural hormones, binding to receptors and triggering inappropriate responses (e.g., BPA acting as an estrogen mimic).
- b) **Receptor antagonism:** Phthalates and certain pesticides block hormone receptors, preventing normal signaling.
- c) **Interference with hormone metabolism:** EDCs can alter the synthesis, transport, or degradation of hormones, affecting their bioavailability.

3) Health Effects [6]:

- a) **Reproductive impacts:** Reduced sperm quality, altered puberty onset, and reproductive malformations such as hypospadias have been associated with EDC exposure.
- b) **Metabolic and neurological effects:** Evidence links EDCs to obesity, insulin resistance, and neurodevelopmental disorders including ADHD and

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autism spectrum conditions.

- c) **Carcinogenic potential:** Long-term exposure to estrogenic or anti-androgenic compounds increases the risk of breast, prostate, and thyroid cancers.
- d) **Ecological effects:** Wildlife populations exposed to EDCs exhibit reproductive abnormalities and population declines, indicating environmental persistence and bioaccumulation.

4) Dooshivisha [7][8]:

Dūṣī viṣha, when lodged in the body, provokes slowly.

Even without any external aggravating factors, it gradually vitiates the body.

Poison- plant, animal, natural or artificial which is not completely eliminated from the body, or which is weakened by antidotes, or attenuated by natural factors (heat, wind, sunlight), or which loses its potency- ultimately becomes

dūṣīviṣh

5) Symptoms of Dusi Visha [9]:

- निद्रा - Sleepiness / drowsiness
- गुरुत्वं- Heaviness of the body
- निजृम्भणम्- Yawning, stretching tendency
- निश्लेष- Loosening of joints / laxity
- हृषष- Horripilation / goosebumps
- अथि- Or
- अङ्गमर्षः Body ache, body soreness.

GARAVISHA [10]:

(Ch. Chi. 23/14)

Garavisha is a variety of visha which is prepared artificially by the combination of substances either poisonous or nonpoisonous. They are slowly metabolized and do not kill the person so quickly.

Signs and Symptoms of Gara Visha according to Astanga Hridya Uttarasthana:

पगण्डु	Paleness
कृश	Emaciated
अल्पगवि	Weak digestive fire
कगस श्वास ज्वरवदात	Cough, dyspnoea, feverish
िगयुनग प्रवतलोमेन	Upward movement of Vata
स्वप्रवचन्तग पगरगयर्ण	Spending more time in sleeping & worrying
महोदर यकृत् प्लीवह	Enlarged abdomen, liver, skin and their diseases
दीनिगक दुरालो अलस	With timid, feeble voice debilitated
शोफिगन्	Develops swelling
सततगध्मगत	Distention of abdomen always
शुष्कपगदकरक्षवय	Dryness of feet and hands
स्वप्ने रोमगयु मगजगार नकुल व्यगल िगनरगन	Seeing animals in dreams such as Jackal, cat, mongoose, snake, monkey Dusi Visha

Dūṣī Viṣha:

It is a type of partially eliminated or weak poison that:

- Acts slowly and cumulatively persists in the Dhātus (especially Rasa, Rakta, Meda) Causes gradual vitiation of Doṣas
- Disturbs Agni (metabolism)
- Initiates long-term Dhātu duṣṭi → chronic diseases Pathogenesis (Samprāpti) of Dūṣī Viṣa Viṣa (toxin) enters the body. It is not completely eliminated, It becomes Dūṣī Viṣa due to:
 - Weak potency
 - Small dose
 - Long-standing accumulation
 - Poor elimination

Dūṣī Viṣha → Agni Māndya (metabolic dysfunction) Agni disturbance → Doṣa prakopa

Doṣas affect Dhātus → Rasa, Rakta, Meda duṣṭi Results in slow, chronic disease formation (“śanaiḥ śanaiḥ dehaṃ dūṣayati” -Charaka)

Modern Equivalent (Correlation):

Dūṣī Viṣha can be compared with:

- Environmental Toxins
 - Pesticides
 - Heavy metals
 - Microplastics
 - Industrial chemicals
- Bioaccumulation & Slow Toxicity
 - Persistent Organic Pollutants (POPs)
 - Heavy metal accumulation
 - Long-term food, water, air contamination
- Oxidative Stress
 - Chronic low-grade oxidative damage
 - Lipid peroxidation
 - Cellular injury
 - Mitochondrial dysfunction
- Endocrine/Metabolic Disruption
 - Hormonal imbalance
 - Reproductive toxicity
 - Thyroid dysfunction
 - Obesity, diabetes (metabolic syndrome)

e) Chronic Disease Development

- Autoimmune diseases
- Neurodegeneration
- Cardiometabolic disorders
- Chronic inflammatory conditions

Hence -

Dushi visa is Endocrine Disruptors + persistent organic pollutants in modern toxicology.

4. Discussion

The reviewed literature demonstrates that EDCs represent a significant and persistent public health concern. Their widespread use, environmental persistence, and ability to act at low concentrations make regulation and mitigation challenging. Although bans on certain EDCs, such as PCBs and DDT, have reduced exposure in some regions, newer substitutes may also pose endocrine risks.

The cumulative and transgenerational effects of EDCs are particularly concerning. Studies suggest that even low-dose exposures during critical developmental windows, such as fetal growth, can result in long-term health consequences. Furthermore, combined exposure to multiple EDCs may have additive or synergistic effects, complicating risk assessment.

To address these issues, policymakers and researchers must collaborate to implement the following measures:

- 1) Strengthen regulations to limit EDC production and use.
- 2) Promote green chemistry to develop safer alternatives.
- 3) Enhance consumer awareness about EDC-free products.
- 4) Support longitudinal research to understand dose-response relationships and intergenerational impacts.

5. Conclusion

Endocrine Disruptor Chemicals (EDCs) pose a significant global health concern due to their ability to interfere with hormonal balance and metabolic functions, leading to reproductive, developmental, neurological, and immune-related disorders. Modern research has established their pervasive presence in food, water, cosmetics, plastics, pesticides, and the environment, making long-term exposure unavoidable.

exposure almost Ayurveda provides a holistic perspective that aligns closely with the modern understanding of EDC-induced health disturbances. Concepts such as Doṣa imbalance, Ama formation, Dhātu vitiation, and impairment of Agni correlate with the systemic dysfunction created by endocrine disruptors. Ayurvedic detoxification approaches including Pañcakarma (especially Virechana and Basti), Rasayana therapy, herbal antioxidants, and lifestyle modifications - offer promising strategies for reducing toxin load and restoring internal homeostasis. Additionally, Ayurveda emphasizes preventive measures such as Dinacharya, Ritucharya, Sadvṛtta, and wholesome dietary habits, which collectively work to minimize exposure and enhance natural defense mechanisms.

Thus, integrating Ayurvedic preventive and therapeutic principles with modern public health strategies can serve as a comprehensive approach to combating the adverse effects of EDCs. This synergy not only addresses the disease burden but also promotes long-term health, environmental awareness, and sustainable living.

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