Impact of Endocrine Disruptors on Reproduction and ART

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Endocrine-disrupting chemicals (EDCs), including ubiquitous substances found in plastics, pesticides, and industrial byproducts, have emerged as significant threats to both male and female reproductive health. The growing body of evidence, as reviewed by Seli and Taylor [2023], highlights the detrimental impact of EDCs and air pollution on fertility, particularly in the context of assisted reproductive technologies (ART). These compounds interfere with hormonal pathways, leading to impaired gametogenesis, altered endometrial receptivity, and reduced embryo quality—ultimately compromising the success rates of ART such as in vitro fertilization (IVF).

Complementing this, Hassan and colleagues [2024] delve deeper into the molecular and epidemiological links between EDC exposure and adverse reproductive outcomes in women. Their findings reveal how EDCs can mimic or block estrogen and androgen activity, disrupt hypothalamic-pituitary-gonadal axis signaling, and induce oxidative stress and inflammation. These mechanisms are closely associated with conditions like polycystic ovary syndrome (PCOS) and endometriosis, further complicating fertility and ART outcomes. Additionally, some EDCs also induce cross-generational effects, inherited by future generations through epigenetic mechanisms.

The increasing knowledge of the impact of EDCs on reproductive biology and outcomes, underscores the urgent need for awareness, regulation, and mitigation strategies related to EDC exposure. By the end of this presentation, nurses should be able to: describe the mechanisms by which EDCs affect reproductive health and fertility; identify common sources of EDC exposure relevant to patient care; and apply evidence-based strategies to educate and counsel patients undergoing fertility treatment on reducing their exposure to harmful environmental chemicals. As frontline providers, nurses are uniquely positioned to advocate for environmental health awareness and contribute to improved reproductive outcomes in both natural and assisted conception contexts.