

Impact of polychlorinated dioxins on fertility: current updates

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Structured Abstract

Background: Dioxins are produced primarily through industrial processes. Polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) are formed during municipal solid waste incineration. Dioxins are produced as unwanted and frequently unavoidable byproducts in a variety of thermal and industrial processes, but they have no use in technology or other fields.

Methods: This article review drew on sources from a variety of UiTM academic databases, including Google Scholar, Scopus, and PubMed, with ScienceDirect being the most frequently used. Among the keywords used were fertility, dioxins, PCDDs, PCDFs, PCBs, TCDD, and spermatogenesis. The 2010-2022 timeframe was chosen to capture recent advances, emerging trends, and data availability in dioxin research.

Results: The effects on sperm quality and quantity, reproductive development, and placental function were all discernible. PCDD exposure was linked to delayed sexual maturation and impaired reproductive function in both sexes, with evidence of possible transgenerational effects. PCBs are widely used due to their stability and toxicity. TCDD, a type of dioxin, is thought to be the most dangerous compound in the dioxin family. TCDD has been linked to decreased fertility, altered hormone levels, and other serious consequences for reproduction.

Conclusion: . This review sheds new light on the effects of polychlorinated dioxins on fertility. The findings show that each type of dioxin has a negative impact on a number of reproductive processes, including sperm quality and quantity, reproductive development, and placental function. Furthermore, this review emphasises potential transgenerational effects, implying that polychlorinated dioxin exposure may have long-term effects on future generations. Prioritising knockout studies to better understand dioxin action and investigating safe exposure levels in relation to fertility and reproduction are among the recommendations. Future research could focus on specific aspects of fertility that are affected by PCDD exposure, such as ovulatory dysfunction, tubal factor infertility, male factor infertility, or unexplained infertility.

Keywords: Spermatogenesis, Dioxin, PCDDs, PCDFs, PCBs, TCDD

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