A systematic review on the effects of environmental obesogenic chemicals on mothers and children

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The global rise in the incidence of obesity cannot be explained only by lifestyle changes, the rise in the exposure to industrial chemicals are considered to have an important role in this regard. Of special concern is the exposure of pregnant mothers and young children to obesogenic chemicals. We conducted a systematic review on the experimental and human studies in this regard.

Multiple international databases were searched for relevant literatures.Two independent reviewers identified relevant papers in several steps with no time or language restrictions.

Our findings propose that the effects of exposure to some chemicals are of crucial importance during developmental phases of life, when preprogramming for an adipogenic outcome may occur. Prenatal or early-life exposure to some substances as endocrine-disrupting chemicals (EDCs) might modify the epigenome of multipotent stromal stem cells, biasing them to the adipocyte lineage at the expense of bone. Hence, humans exposed to obesogens during early life might have an altered stem cell compartment, already preprogrammed for an adipogenic outcome.

The commonest chemicals studied as possible obesogens include diethylstilbestrol (DES), bisphenol A (BPA), phthalates, organotins, polybrominated diphenyl ethers (PBDEs), polyfluoroalkyl chemicals (PFCs), organochlorine (OC) pesticides, and polychlorinated biphenyls (PCBs) and some solvents caused weight gain, and it is proposed that these chemicals were interfering with weight homeostasis by changing weight-controlling hormones, modifying sensitivity to neurotransmitters, or altering the sympathetic nervous system activity.

By considering the adverse transgenerational effects of obesogen chemicals on human health, the global obesity epidemic should be considered as a multifactorial complex disorder warranting the emphasis of public health interventions for environmental protection, notably for pregnant women, infants, and young children.

Keywords: Obesity; environmental obesogens; prenatal period; childhood; systematic review