

Letter to Editor

Exposure to Microplastics is Associated With the Risk of Cancer in Children

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Dear Editor

Microplastics (MPs) are an emerging environmental contaminant that has raised public concern [1, 2]. MPs are plastic particles less than 5 mm in size. MPs are polymers, usually containing carbon, oxygen, hydrogen, and/or silicon. Polyethylene, polyamide, polypropylene, and poly (ethylene terephthalate) are the most common polymers. The MPs have various forms, including fibers, fragments, and films, and colors, including colorless, black, and brown forms. They are found in tap water, bottled water, beverages, air, oceans, and soil.

Humans are exposed to the MPs at 0.1–5 g weekly and 39,000–52,000 particles annually, depending on age and gender, through inhalation, ingestion, and potentially direct skin contact [3, 4]. Human exposure to the MPs is now considered a global issue, but current gaps in knowledge have missed public health considerations. MPs, with a tiny size, have a significant capacity to absorb and accumulate toxic chemicals from the surrounding environment. When ingested or inhaled, they can release these toxins directly into the body, potentially triggering cancerous transformations in cells [5].

While MPs in the form of heavily cross-linked polymers have been considered as a safe material, their bonds can break down during repeated washing, heat, or other stresses, and release the toxic chemical. Bisphenol A (BPA) and diethylhexyl phthalate (DEHP) are used in the MPs' structure as plasticizers to cause flexibility in them. BPA and DEHP are defined as endocrine-disrupting compounds (EDCs). An EDC is a synthetic agent that disrupts the synthesis, secretion, metabolism, and binding action of natural blood-borne hormones. Therefore, they affect natural homeostasis, reproduction, and developmental processes [5].

Children can be exposed to MPs through toys [3], personal care products, and the use of plastics in food and beverage packaging [6]. Infants are exposed to MPs more due to crawling and hand-to-mouth activities. They can absorb more environmental toxins resulting from more ingestion, inhalation, and skin-to-skin contact [7, 8]. Also, they are more vulnerable to toxic materials, considering the critical processes of neurobehavioral, immunological, metabolic, and cardiovascular development. As a result, exposure to harmful substances in childhood can cause long-lasting effects throughout life [6]. The existing scientific evidence showed that childhood exposure to MPs affects the immune system,

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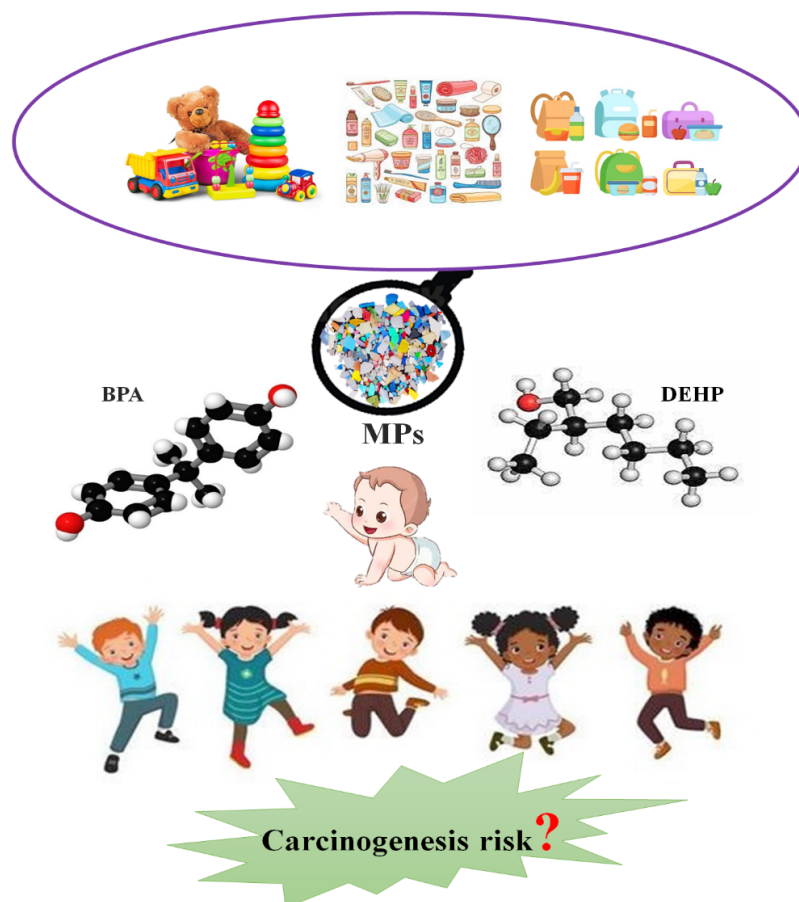


Figure 1. Schematic representation of the association between MP exposure and risk of cancer in children *Journal of Pediatrics Review*

which may be related to the development of different diseases, including cancer in children [7]. The association between exposure to MPs and risk of cancer in children is illustrated in Figure 1.

There is a challenge in determining if a particular constituent or a compound in MPs or toxic chemicals absorbed from the surrounding environment causes different types of cancers and other diseases associated with MPs in children. So, future studies are recommended to fill these knowledge gaps. It is recommended to reduce children's exposure to MPs by using BPA-free or non-plastic materials. Given the unknown risk of MP exposure in pregnancy and childhood, to diminish childhood exposure to the MPs, greater surveillance of MPs in children, lower use of plastic products for children, consistent wet cleaning of the house, and careful selection of safe personal care products, toys, and building materials are recommended.

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