



Impact of Atmospheric Microplastics on Human Health

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ABSTRACT

Introduction: Microplastics, a global environmental concern, raise health risks. Exposure through ingestion, inhalation, and skin contact is worrisome. Inhalation can harm respiratory and cardiovascular health, causing inflammation and oxidative stress. Due to their size, microplastics reach the alveoli, affecting lung function. This study investigated airborne microplastics and their health impact, aiming to understand their characteristics and effects on human health.

Search Strategy: Based on the bibliographic survey conducted on May 21, 2024, using broad match keywords such as "microplastics", "Atmosphere", "Lung", and "Human health", a total of 801 articles were identified across platforms like ScienceDirect, PubMed, Google Scholar, and Scopus. These articles were screened based on titles, keywords, and abstracts, with 20 articles meeting the inclusion criteria for the review. The review process involved carefully examining and collecting essential information from these selected articles to gain insights into the impact of microplastics on human health, particularly regarding atmospheric exposure and respiratory effects.

Results: Over half of the studies reviewed reported an average daily microplastic concentration in the atmosphere surpassing 100 particles per square meter. Most of these studies (over 90%) identified fibers as the dominant type of microplastics in the air. Moreover, 75% of the articles estimated the average size of atmospheric fibers to fall between 100-5000 μm . About two-thirds of the investigations pinpointed polyethylene as the leading polymer, followed by polyvinyl chloride as the second most common. The results showed that exposure to microplastics was linked to histopathological abnormalities and dysfunctions in several organ systems, including the digestive, respiratory, cardiovascular, immune, reproductive, and endocrine systems.

Conclusion and Discussion: Polyethylene and polyvinyl chloride are the most prevalent types of atmospheric microplastics found at high concentrations and pose significant health hazards. These findings underscore the connection between microplastic exposure and detrimental effects on multiple organ systems, including the digestive, respiratory, cardiovascular, immune, reproductive, and endocrine systems. This information emphasizes the profound influence of atmospheric microplastics on human health, underscoring the need for further research and mitigation strategies to address this emerging environmental and public health concern.

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