

Potential Harm of Microplastics to Cardiovascular and Brain Health

Microplastics have, for several decades, invaded our environment and threaten the health of all living organisms on the planet, including humans.

By Jingduan Yang

6/8/2024 Updated: 6/11/2024

Microplastic pollution is widespread, presenting significant health hazards. A study published in March revealed that microplastics increase the risk of cardiovascular disease and stroke by more than four times. How can we prevent and address the health threats posed by microplastics?

Microplastics—a Ubiquitous Pollutant

Plastic particles smaller than five millimeters in diameter are referred to as microplastics. A March study, published in the journal *Science of The Total Environment* focused on excavations taken from a historic site in the 1980s, analyzing soil sediment found underground at a depth of seven meters. The results revealed 16 types of microplastic polymers, indicating that microplastic pollution was present as early as the 1980s. Microplastics come from a variety of plastic products, including personal care items like exfoliating skin products and toothpaste containing plastic microbeads. Additionally, synthetic fibers in clothing also contribute to microplastic pollution. The ubiquitousness of microplastics in our air, water, food, and everyday items makes avoiding them impossible.

Health Hazards of Microplastics

Microplastics affect human health in three primary ways:

1. Microplastics can trigger chronic inflammation. Research indicates that microplastics mainly cause harm to health by inducing inflammation and disrupting the immune system. Chronic inflammation can damage blood vessel linings and cell membranes, predisposing individuals to various chronic diseases.
2. Microplastics and the chemicals they degrade into can cause oxidative stress in our bodies. One study found that microplastics induce oxidative stress in tissues, inhibit enzyme activities, and promote lipid peroxidation. Oxidative stress is a self-defense mechanism in our bodies. While normally not problematic, excessive oxidative stress can lead to an overproduction of free radicals, which can damage our body's cells and tissues, thereby increasing the risk of various diseases.
3. Microplastics can also adsorb other toxic chemicals, such as heavy metals, causing further harm to the body.

The Link Between Microplastics and Cardiovascular Diseases

In March, *The New England Journal of Medicine* published a study in which researchers examined 304 patients who had plaque in their carotid arteries. Although these patients had not experienced any symptoms, they underwent surgery to remove the plaque, as it is akin to a time bomb that can detach at any moment, leading to cardiovascular diseases such as heart attacks and strokes.

After analyzing the carotid artery plaques in all patients, the researchers detected polyethylene in the plaques of 150 patients and polyvinyl chloride in the plaques of 31 patients. In other words, microplastics were found in the carotid artery plaques of 181 out of 304 patients.

The researchers followed the participants for approximately 34 months. The results showed that patients with microplastics in their carotid artery plaques had a 4.5 times higher composite risk of myocardial infarction (heart attack), stroke, or all-cause death, compared to patients without microplastics.

Strategies to Combat Microplastics

Faced with such concerning research results, what can we do to address the harm of microplastic pollution? Firstly, a collective effort to avoid using various plastic products and to seek safer alternatives in industrial production would help. The addition of plastic microbeads to everyday products such as toothpaste and skincare should be prohibited. Additionally, we need to ensure the proper management of plastic waste.

Certainly, the actions outlined above require governments to enact relevant policies. Our health is not solely our own responsibility or that of doctors—the government also plays a crucial role. While doctors in hospitals address health problems and individuals manage their own health, the government's role is upstream, encompassing the formulation of health care and epidemic prevention policies that significantly impact our well-being.

Nutrients for Detoxification

There is currently no medication or health product that can completely remove microplastics from the body. However, we can consider the reasonable use of the following types of health products to mitigate the effects of microplastics on the body.

1. **Antioxidants:** Whether we get them through food or supplements, vitamins A, C, and E, and glutathione all act as antioxidants to neutralize free radicals and protect our cells.
2. **Omega-3:** Omega-3 fatty acids play a vital role in supporting the health of cell membranes by maintaining their structure and function.
3. **Probiotics:** Probiotics can support the digestive and detoxification functions of our gastrointestinal system.
4. **Herbal extracts:** Extracts of certain herbs, such as turmeric, dandelion, and milk thistle can contribute to liver detoxification.
5. **Green algae and spirulina:** Both are rich in chlorophyll and antioxidants, which can help eliminate heavy metals and other toxins from the body, thus aiding in detoxification.
6. **N-acetylcysteine (NAC):** NAC serves as a precursor to glutathione. Glutathione is vulnerable to degradation during absorption. Supplementing with NAC to increase glutathione levels in our body can promote antioxidant and anti-inflammatory effects.
7. **Activated charcoal:** In some cases, activated charcoal can act as a detoxifier in the intestines.
8. **Vitamin D:** Vitamin D regulates cellular functions and provides significant support to the immune system, thereby enhancing the body's defense against various environmental factors.

In summary, we must recognize the health hazards of microplastics and take steps to mitigate the risks they pose.