New research points to serious health risks of microplastics entering the human body

New research points to serious health risks of microplastics entering the human bodyAnimal studies have found that consuming nanoplastics (a form of microplastic) is associated with serious metabolic and liver function changes.

A new animal study suggests that tiny microplastic particles in food and drink can disrupt glucose metabolism and damage organs such as the liver and kidneys. The findings raise concerns about potential health risks in humans and highlight the need for further research.

As plastic breaks down, it creates microplastics (smaller than 5 mm) and nanoplastics (smaller than 100 nanometers - nm), collectively known as microplastics. These tiny plastic particles can enter the food chain and accumulate in seafood and other common foods. Estimates suggest that each person may consume between 40,000 and 50,000 microplastic particles per year, even up to millions in some special cases.

" *Given the growing concerns about exposure to microplastics and nanoplastics, we wanted to assess the health impacts of this exposure,* " said Dr. Amy Parkhurst at the University of California, Davis. " *Our observation that ingestion of polystyrene nanoplastics contributes to glucose intolerance and signs of liver injury confirms and extends what has been recently reported about the effects of nanoplastics in animal models* ."

Simulates the actual absorption process

In the new study, the researchers focused on oral exposure to mimic nanoparticles found in food and beverages. They fed 12-week-old male mice a standard rodent diet along with a daily oral dose of polystyrene nanoplastic. Polystyrene is a widely used plastic, commonly found in food packaging and consumer products. The team chose a daily dose of 60 mg per kg of body weight of nanoplastic based on exposure levels in humans and previous studies in mice showing health effects at similar doses.

' *We couldn't control all the types of plastics the mice were exposed to* ,' Parkhurst said. ' *However, our study design allowed us to observe dose-related changes because the group fed nanoplastics would have had higher exposure* .'

Liver damage and glucose intolerance

Compared to a control group that did not receive polystyrene, mice that consumed nanoplastics exhibited systemic glucose intolerance and elevated alanine aminotransferase levels (a marker of liver damage). In mice that consumed polystyrene, researchers also observed increased intestinal permeability and elevated endotoxin levels, factors that contribute to liver dysfunction.

The team is continuing to study the effects of nanoplastics on other tissues. They want to conduct further studies in rodent models to better understand the tissues and organs affected by nanoplastics as well as the underlying molecular mechanisms involved.

In the future, scientists will use matrix-assisted laser desorption/ionization mass spectrometry imaging (MALDI-MSI) to monitor nanoplastic bioaccumulation with high resolution and assess tissue-specific metabolic changes.