

Deadly diesel particles from toxic air penetrate the heart

Kat Lay Health Correspondent

Scientists have proved that deadly particles of pollution can get into the bloodstream by asking volunteers to breathe in microscopic specks of gold.

Research has shown that particles a thousand times smaller than the width of a human hair can pass through the lungs. It was demonstrated for the first time that they gather in the most vulnerable areas of blood vessels.

Experts said that the study provided the "missing link" between airborne nanoparticles, often generated by vehicle emissions, and the increase in levels of poor heart health as pollution levels rise.

Campaigners said it added fresh weight to their calls for government action on air quality.

Sadiq Khan, the London mayor, said it was "further evidence" that toxic air was the biggest environmental health crisis of our generation. Air pollution is thought to be responsible for 40,000

premature deaths a year in Britain. Cardiovascular disease accounts for 80 per cent of all premature deaths from air pollution.

As part of the study, published in the journal *ACS Nano*, participants inhaled nanoparticles of gold. The harmless specks can be easily measured in the body, unlike carbon.

Gold was detected in the participants' blood and urine within 24 hours, and could still be measured three months after the initial exposure.

The study also asked patients at high risk of stroke who were due to have surgery to inhale the gold. Analysis of clogging material removed from their arteries the next day showed that the particles accumulated in fatty deposits inside blood vessels.

Mark Miller, lead researcher, from the University of Edinburgh, said: "These findings suggest that ultrafine nanoparticles in air pollution may well do the same thing. They will enter the blood and accumulate at sites of vascu-

lar disease. And while gold is not a very reactive particle, environmental particles are highly reactive. It doesn't take large amounts of these particles. If they reach these susceptible areas it can have serious health consequences."

Dr Miller said that particles trapped by immune system cells might build up in vulnerable areas.

His co-author, David Newby, said that it could also be that they were more likely to collect in certain parts of blood vessels, much like sediment builds up in certain parts of a river.

Current clean-air regulations focus on larger particles rather than nanoparticles. Yet the scientists believe that the really small particles are the most dangerous. Professor Newby suggested that scientists were looking in the wrong place.

Jeremy Pearson, associate medical director at the British Heart Foundation, which co-funded the research, said: "There is no doubt that air pollution is a killer and this study brings us a

step closer to solving the mystery of how air pollution damages our cardiovascular health.

"Individual avoidance of polluted areas is not a solution. Government must put forward bold measures to protect the population from harm."

The government will hear today whether its application to the High Court to delay until June 30 publication of its air quality plan because of the general election has been successful.

Mr Khan said: "Ministers have been appallingly slow to act on their duty to protect the public from this silent killer. I urge government to stop dragging their feet and deliver an action plan that will tackle this crisis once and for all."

Simon Birkett, founder and director of Clean Air in London, said: "The more scientists look, the more they find about the dangers of air pollution.

"The High Court must insist that the government publishes its plan immediately to comply with nitrogen dioxide limit values."

Times 27-4-17