

CT scans explain mysterious 9/11 cough

16:20 30 November 04

NewScientist.com news service

Inhaling toxic dust from the World Trade Center disaster on 11 September 2001 has damaged some rescue workers' lungs more than years of smoking, US scientists reveal. Using an unconventional chest scan for the circumstances, researchers were able to capture visual signs of the severe respiratory problems that doctors could not otherwise have diagnosed.

Hundreds of people have been tested and treated for respiratory problems - or "World Trade Center cough" - since New York City's twin towers fell, most of them suffering from asthma-like breathing difficulties. Some people, however, maintained persistent but unidentifiable coughs that could not be picked up using standard chest computed tomography (CT) scans.

"These people had symptoms that just didn't fit the typical pattern. They weren't treated at first because there wasn't any objective evidence of what was wrong," says lead author David Mendelson at Mount Sinai Hospital in New York City, US.

So Mendelson's team turned to a technique called end-expiratory CT. In a normal chest scan, patients are asked to take a deep breath and hold it. In end-expiratory scans, patients take in a deep breath and release it slowly. In a healthy individual, the entire chest should be seen on the scan as an even grey colour - the CT representation of moving air.

The doctors scanned 29 rescue and recovery workers with unexplained symptoms. In 25 of these they saw splotchy black patches deep down in the finer, branching tubes of their airways. Black spots mean that air is trapped and stagnating in the lungs, making it difficult for the patients to breathe freely.

Pulverised cement

In order to gauge the severity of the air-trapping pattern, the authors developed a visual scale that ranged from 0 to 24. Mendelson says that smokers would probably fall somewhere between 0 to 4 on his scale. The World Trade Center rescue workers, however, averaged 10.55.

The extent of air trapping was found to reflect the amount of time each worker was exposed to the dust and debris of the buildings' collapse.

The most likely culprit behind this type of airway disease is pulverised alkaline cement, says Mendelson, who presented his findings at the Radiological Society of North America's meeting in Chicago on Tuesday. All of the subjects are now being treated with anti-inflammatory drugs.

Richard Russell, of the British Thoracic Society in London, UK, is not surprised by the degree of lung tissue damage caused by exposure to the fine cement dust, which is capable of penetrating deeply into the lungs and damaging the delicate tissues found there.

But he warns that the rescue workers' breathing problems might be permanent: "This is a physical problem that's not going to go away with simple anti-inflammatories," he says. "We'll just have to watch and see if the patients get better over time and make sure they're not smoking."

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