

## Health

### Air pollution harms health

#### Brief visit to polluted city can up heart disease biomarkers

NEW YORK, Dec 10, (RTRS): Air pollution has often been linked with increased heart disease risk, but a "natural experiment" involving travelers to a city much more polluted than their own offers clues to how it may harm blood vessels over time, researchers say.

In 26 healthy young adults from Los Angeles, researchers measured blood levels of pollution breakdown products and proteins linked to heart risk before, during and after a trip to Beijing for a summer study program.

Over six to eight weeks in the Chinese capital, pollution metabolites in participants' urine spiked along with blood markers of inflammation and artery plaque buildup, the study team reports in the journal *Circulation*.

These results are "lending more evidence that the (heart disease) pathways that have been observed in animals, now could be happening in humans," noted Erika Garcia, an environmental health researcher at the University of Southern California in Los Angeles, who was not involved in the study.

Air pollution is a serious public health problem in China, where it adversely affects the heart health of the 1.4 billion residents, the study team notes.

#### Environment

Past research has linked long-term exposure to air pollution with heart disease and early death, they write. Studies in animals have also linked particle pollution with atherosclerosis, or hardening of the arteries, due to plaque build-up. The effects of exposing people to air pollution for shorter periods have not been well studied, however.

To see whether even a short shift from a less-polluted environment to a more-polluted one would affect so-called biomarkers that are known to be involved in heart disease, the researchers took advantage of a study-abroad summer program run by the University of California, Los Angeles (UCLA) and the University of Peking in Beijing.

They recruited 26 non-smoking, healthy UCLA students, with an average age of 24, who visited Beijing for 10 weeks in 2014 or 2015.

Urine and blood samples were collected from the students about a week before their departure from LA, six to eight weeks after their arrival in Beijing, and four to seven weeks after they returned to LA.

While the students were in Beijing, tiny-particle air pollution levels averaged 371% higher than in LA and pollution breakdown products in the students' urine rose to concentrations 176% to 800% higher than they had been in LA, the study found.

Activity by enzymes that promote HDL, the "good" cholesterol, was impaired while students were in Beijing, although students' HDL levels remained unchanged, the researchers report. Fibrinogen, a blood marker of inflammation, rose by nearly 50%, and C-reactive protein (CRP), another inflammation marker, nearly doubled while the students were abroad. Markers of blood-fat oxidation, which contributes to plaque buildup, rose as well. By the six-week mark in Bei-

jing, air particulate matter had already had a significant effect on students' biomarkers and the pathways involved in atherosclerosis and development of heart disease had been "activated," Dr Jesus Araujo, a cardiologist at the David Geffen School of Medicine at UCLA and the study's senior author, told Reuters Health.

"We can (now) have a sense of when a person would be affected by the increased exposure as opposed to waiting for many months or years and later on when the damage has already been done," he said in a phone interview.

The effects of exposure in Beijing were largely reversed after the students returned to Los Angeles. But it is still not known whether short-term visits to places with severe air pollution could raise the risk of developing chronic cardiovascular disease, the study authors note.

Travelers to countries with severe air pollution such as India and China could try remaining indoors, using air purifiers and avoiding physical activity outdoors, Araujo advised.

#### Also:

NEW YORK: Older adults who are exposed to tiny particles in air pollution for just a day or two are more likely to be hospitalized for a wide variety of common health problems, a US study suggests.

Researchers focused on so-called PM 2.5, a mixture of solid particles and liquid droplets smaller than 2.5 micrometers in diameter that can include dust, dirt, soot and smoke. They confirmed previously-known links between short-term exposure to PM 2.5 and an increased risk of hospitalization and death from heart and lung diseases, diabetes, and clots in the large veins of the legs. They also found new links between short-term exposure and increased hospitalizations for conditions ranging from sepsis to kidney failure.

The study team examined hospital data for Medicare patients nationwide from 2000 to 2012. They focused on 214 different health conditions, and looked at data on average air pollution levels the day before and the day of each hospitalization based on patients' home zip codes.

"We discovered several previously unknown but common diseases among older adults, such as fluid and electrolyte disorders, septicemia, anemia, urinary tract infections, and renal failure, even when daily PM2.5 concentrations were below the current World Health Organization (WHO) air quality guidelines," said lead study author Yaguang Wei, an environmental health researcher at the Harvard T.H. Chan School of Public Health in Boston.

"PM2.5 is composed of tiny solids and liquids floating in the air and once inhaled, these particles can pass through the respiratory system, sneak into the blood and circulatory system, and cause serious health problems," Wei said by email.

"The most consistent and dangerous health effects identified have been cardiovascular and respiratory diseases, which are the leading causes of hospitalization, emergency room visit, and even death," Wei added.

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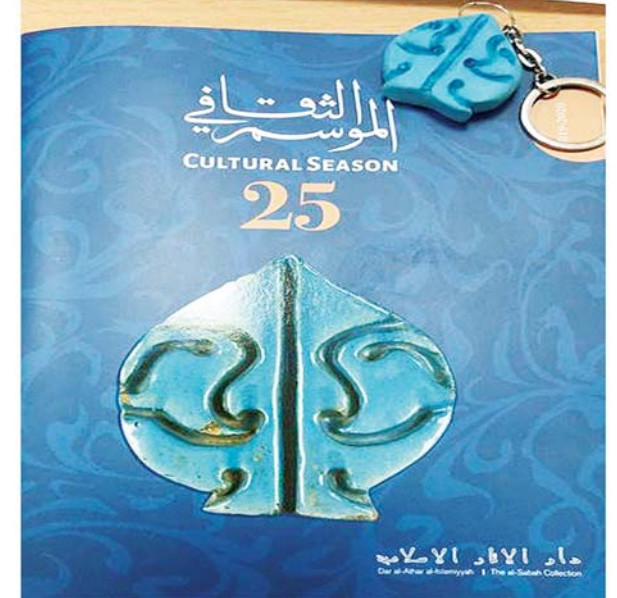
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A flyer of the event

### New children's study raises question

## Brain differences may be tied to obesity

School performance worsens as hearing declined

### Slight hearing loss may affect kids' behavior

NEW YORK, Dec 10, (AP): New results from the largest long-term study of brain development and children's health raise provocative questions about obesity and brain function.

Does excess body weight somehow reduce brain regions that regulate planning and impulse control? Is obesity a result of that brain difference? Or are eating habits, lifestyle, family circumstances and genetics to blame?

Previous studies in children and adults have had conflicting results. The new research doesn't settle the matter and outside experts cautioned that misinterpreting it could unfairly perpetuate weight stigma.

But an editorial published with the study Monday in *JAMA Pediatrics* called it an important addition to mounting evidence of a link between weight, brain structure and mental function.

If follow-up research confirms the findings, it could lead to new ways to prevent obesity that target improved brain function.

"We don't know which direction these relationships go nor do they suggest that people with obesity are not as smart as people at a healthy weight," said Dr Eliana Perrin, a Duke University pediatrics professor who co-wrote the editorial.

#### Function

The federally-funded study involved 3,190 US children aged 9 and 10. They had height and weight measurements, MRI brain scans and computer-based tests of mental function including memory, language, reasoning and impulse control. Nearly 1,000 kids - almost 1 in 3 - were overweight or obese, similar to national statistics.

Researchers found differences in the heaviest children's brain scans, slightly less volume in the brain region behind the forehead that controls what are known as "executive function" tasks. They include things like ability to plan, control impulses and handle multiple tasks simultaneously.

The differences compared with normal-weight kids were subtle, said study author Scott Mackey, a neuroscientist at the University of Vermont. The heaviest kids also had slightly

their teacher. And for children who seem to have trouble keeping up at school or whose attention span is limited, a hearing test could be considered.

Le Clercq and colleagues focused on children who had problems hearing tones below 25 decibels. "Rustling leaves are approximately 20 decibels," le Clercq explained. "Maybe it is not a big deal if you can't hear rustling leaves. However, (for people who can't), almost all normal speech will be softer in their ears. You can imagine it takes more effort to understand that speech, especially if it is like that all day long."

Le Clercq's team studied 4,779 children born between 2002 and 2006. Children with moderate or severe hearing loss were excluded from the study.

Between ages 9 and 11, the children had their hearing checked in a quiet room. A smaller group got a second exam, in which their ability to hear speech in a noisy environment was tested. School performance and behavioral problems worsened as hearing declined, the researchers found.

worse scores on computer-based tests of executive function. But Mackey and lead author Jennifer Laurent, a University of Vermont obesity researcher, said it's unknown whether any of the differences had any meaningful effect on children's academic functioning or behavior. It's unclear exactly how they are related to weight and Mackey said it's likely other factors not measured in the study including physical activity and healthy nutrition play a far greater role.

Research in adults has linked obesity with low-level inflammation throughout the body that can damage blood vessels and may increase risks for heart disease and mental decline. Some studies have also found less brain volume in obese adults and researchers theorize that it could be from inflammation. The new study raises the possibility that inflammatory changes affecting weight, brain structure and function might begin in childhood. The latest research confirms previous studies in children and adults, but it leaves many questions unanswered, said Marci Gluck, a research psychologist at the National Institute of Diabetes and Digestive and Kidney Diseases, who was not part of the research. "Executive function deficits and 'intel-

The new study "highlights the fact that hearing loss, whether severe or slight, may affect behavior and school performance," said Dr David Chi, who is chief of the division of pediatric otolaryngology at UPMC Children's Hospital of Pittsburgh.

Slight hearing deficiencies may be enough to make it hard for kids to discern "certain words when there is more background noise in the classroom," Chi said. The noise could simply come from "the chatter of peers or the sound coming from the heating or cooling system."

Chi, who coauthored an editorial accompanying the new study, agrees that children with mild hearing problems should be seated at the front of the classroom and recommends that teachers with softer voices be equipped with microphones. "We've all had teachers who mutter and are a challenge to hear," he said.

"The bottom line is that this should not be ignored and we should provide interventions for those who have even slight hearing loss," Chi said.

glence' are not the same," Gluck said. Obesity researcher Natasha Schvey of the Uniformed Services University of the Health Sciences called the study impressive, but noted that eating habits and obesity are influenced by many factors, including metabolic and psychological differences.

"We know from a lot of really good research that obesity is not as much an individual's control as we think it is. People talk about willpower - that's a very small part of the equation," she said. "There are much bigger contributors to our weight and a lot of it is genetic. That's not to say it's immutable."

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