Women are more athletic than men: Study

Toronto, Dec 6 : Challenging the popular notion that men are more fit for exercise of all sorts, a new study has shown that women have a natural capacity to process oxygen more quickly than men during aerobic exercises, making them more athletic.

The findings showed that the faster processing of oxygen enabled the cells of a woman's body to undergo less strain especially during aerobic exercises -- such as cardio, spinning, running, swimming, walking, hiking -- which require oxygen to help produce energy.

"The findings are contrary to the popular assumption that men's bodies are more naturally athletic," said lead author Thomas Beltrame, Professor at the University of Waterloo in Ontario, Canada. "We found that women's muscles extract oxygen from the blood faster, which, scientifically speaking, indicates a superior aerobic system," added Richard Hughson, another researcher at the varsity.

The study, published in the journal Applied Physiology, Nutrition, and Metabolism, compared the oxygen uptake and muscle oxygen extraction between healthy and active young men and women of similar age and weight during a treadmill exercise.

Women were found to consistently outperform men with around 30 per cent faster oxygen handling throughout the body during the exercise.

These women were also less likely to accumulate molecules linked with muscle fatigue, effort perception and poor athletic performance.

Restless sleep may up risk of Parkinson's in men

London, Dec 6 : Do you lack a restful sleep and are in the habit of hitting or kicking in your sleep? Beware, according to a study, this could be a sign of a disorder associated with Parkinson's disease, especially in men.

The rapid eye movement sleep behaviour disorder or RBD, which most often affects persons aged 50-70, and more frequently in men than women, is characterised by disturbances in the part of sleep where dreams take place.

While healthy people are relaxed and lie still during dream sleep, people suffering from RBD live out their dreams and during sleep they hit, kick and shout.

The study, published in the journal The Lancet Neurology, showed that men with RBD lack dopamine — a chemical in the brain that affects emotions, movements and sensations of pleasure and pain — and have a form of inflammation of the brain.

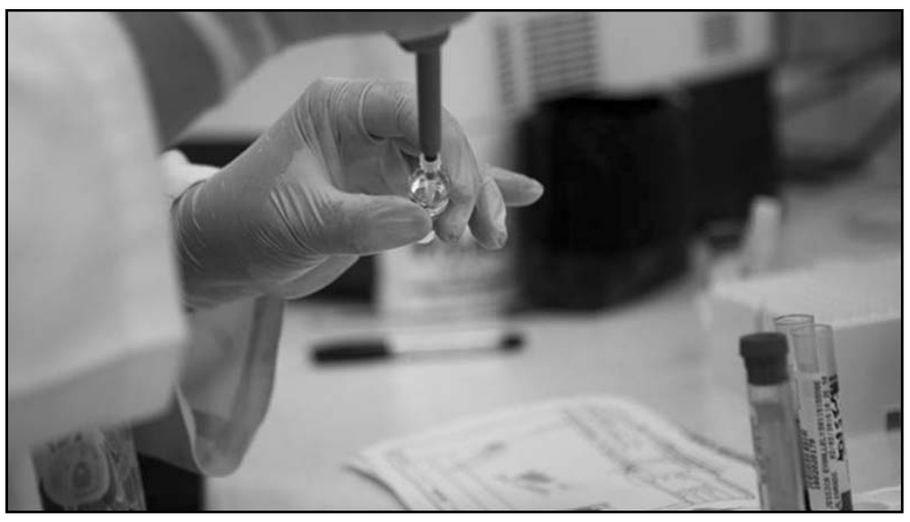
As a result, their risk of developing Parkinson's disease or dementia when they grow older increases. Parkinson's disease occurs precisely because the group of nerve cells in the brain that produce dopamine stop working.

"These patients have an inflammation of the brain in the area where the dopamine-producing nerve cells are found," said Morten Gersel Stokholm from Aarhus University in Denmark.

Researchers were not previously aware that there is a form of inflammation of the brain in patients who are at risk of developing Parkinson's disease. "The findings would be used to determine which patients with the sleep disorder will later develop Parkinson's disease. At the same time, this can also help to develop drugs which can stop or slow the development of the diseases," Stokholm explained.

In this study, patients with RBD and no clinical evidence of Parkinson's and cognitive impairment were recruited from tertiary sleep centres in Spain and Denmark and their brain changes were analysed using Positron emission tomography (PET).

Zika vaccine found safe in preventing infection



New York, Dec 6 : An experimental Zika vaccine developed by US scientists has been found in two early clinical trails to be safe and promising in preventing infection by the deadly virus. The findings, published in the journal Lancet, showed that it induced an immune response in healthy adults. The investigational vaccine, developed by scientists at the National Institute of Allergy and Infectious Diseases (NIAID), part of the US National Institutes of Health, includes a small, circular piece of DNA called a plasmid.

Scientists inserted genes into the plasmid that encode two proteins found on the surface of the Zika virus.

The researchers found that when the vaccine was injected into muscle, the body produced proteins that assemble into particles that mimic the Zika virus and trigger the body to mount an immune response.

For clinical testing, the researchers developed two different plasmids – VRC5288 and VRC5283. They were tested in two separate trials.

The scientists analysed blood samples obtained from participants four weeks after their final vaccinations.

They found that 60 to 89 per cent of participants generated a neutralising antibody response to VRC5288, whereas 77 to 100 per cent of participants generated a neutralising antibody response to VRC5283.

"Following early reports that Zika infection during pregnancy can lead to birth defects, NIAID scientists rapidly created one of the first investigational Zika vaccines using a DNA-based platform and began initial studies in healthy adults less than one year later," said NIAID Director Anthony Fauci.

"NIAID has begun Phase 2 testing of this candidate to determine if it can prevent Zika virus infection, and the promising Phase 1 data published today support its continued development," Fauci said on Monday.

Blood pressure starts dropping 14 years prior to death: Study

New York, Dec 6 : Doctors have long known that in the average person, blood pressure rises from childhood to middle age, but a new study warns that in the elderly, blood pressure gradually begins to decrease about 14 years before death.

The study that looked at the electronic medical records of 46,634 British citizens who had died at age 60 or older showed that blood pressure declines were present not only in those with hypertension but also in those who were not diagnosed with the condition.

The findings, published in the Journal of the American Medical Association Internal Medicine, however, do not suggest that hypertension should not be treated in late life or that those diagnosed with hypertension should stop their blood pressure medications.

"Our work highlights the importance of conducting research evaluating older patients like those seen in physician practices everywhere," said one of the study authors George Kuchel from the University of Connecticut in the US.

The researchers found blood pressure declines were steepest in patients with dementia, heart failure, late-in-life weight loss, and those who had high blood pressure to begin with.

But long-term declines also occurred without the presence of any of these diagnoses.

The findings should make both doctors and researchers carefully consider what dropping blood pressure really means for older patients, Kuchel said.

More research is needed to figure out why blood pressure declines in the elderly in this way.

"Observational studies such as ours need to be followed by rigorous clinical trials in order to guide clinical care guidelines," Kuchel said.

Exercise, not just diet, can change gut bacteria

New York, Dec 6 : If you thought only diet can change the composition of microbes in the gut, think again! Researchers have found evidence that exercise can change the intestinal microbiota independent of diet. The research provides clues to how exercise could benefit people suffering from inflammatory bowel disease.

The findings, published in the journal, Medicine & Science in Sports & Exercise, are based on two studies — one in mice and the other in human participants. In the first study, scientists transplanted fecal material from exercised and sedentary mice into the colons of sedentary germ-free mice, which had been raised in a sterile facility and had no microbiota of their own.

In the second study, the team tracked changes in the composition of gut microbiota in human participants as they transitioned from a sedentary lifestyle to a more active one — and back again. "These are the first studies to show that exercise can have an effect on your gut independent of diet or other factors," said one of the lead researchers Jeffrey Woods, Professor at the University of Illinois in the US.

In the mouse study, changes in the microbiota of recipient mice mirrored those in the donor mice, with clear differences between those receiving microbes from exercised and sedentary mice. "That proved to us that the transplant worked," Woods said.

Recipients of the exercised mouse microbiota also had a higher proportion of microbes that produce butyrate, a short-chain fatty acid that promotes healthy intestinal cells, reduces inflammation and generates energy for the host.They also appeared to be more resistant to experimental ulcerative colitis, an inflammatory bowel disease.

In the human study, the participants performed supervised cardiovascular exercise for 30-60 minutes three times a week for six weeks. The researchers sampled their gut microbiomes before and after the end of the exercise programme and after another six weeks of sedentary behaviour.

Participants maintained their usual diets throughout the course of the study. Fecal concentrations of short-chain fatty acids, in particular butyrate, went up in the human gut as a result of exercise, the study said. These levels declined again after the participants reverted to a sedentary lifestyle. Genetic tests of the microbiota confirmed that this corresponded to changes in the proportion of microbes that produce butyrate and other short-chain fatty acids.

MIT 3-D prints a 'living tattoo' with bacteria cells

New York, Dec 6 : Engineers at Massachusetts Institute of Technology (MIT) have found a way to 3-D print a "living tattoo" using a new kind of ink made from genetically programmed living bacteria cells.

The "living tattoo" -- a thin, transparent patch patterned with live bacteria cells in the shape of a tree -- could have implications for future wearable sensors and in the manufacturing of drug capsules and surgical implants.

The cells were engineered to light up in response to a variety of stimuli, showed the study published in the journal Advanced Materials.

The researchers came up with a recipe for their 3-D ink, using a combination of bacteria, hydrogel, and nutrients to sustain the cells and maintain their functionality.

"We found this new ink formula works very well and can print at a high resolution of about 30 micrometres per feature," said Xuanhe Zhao, Professor in MIT's Department of Mechanical Engineering.

"That means each line we print contains only a few cells. We can also print relatively large-scale structures, measuring several centimetres," Zhao added.

They printed the ink using a custom 3-D printer that they built using standard elements combined with fixtures they machined themselves.

To test the patch, the researchers smeared several chemical compounds onto the back of a hand, then pressed the hydrogel patch over the exposed skin. Over several hours, branches of the patch's tree lit up when bacteria sensed their corresponding chemical stimuli. The researchers also engineered bacteria to communicate with each other. For instance they programmed some cells to light up only when they receive a certain signal from another cell.

The researchers believe that the technique can be used to fabricate "active" materials for wearable sensors and interactive displays.

Such materials could be patterned with live cells engineered to sense environmental chemicals and pollutants as well as changes in temperature.

In the future, researchers may also use the technique to print "living computers" -- structures with multiple types of cells that communicate with each other, passing signals back and forth, much like transistors on a microchip.

"This is very future work, but we expect to be able to print living computational platforms that could be wearable," said graduate student Hyunwoo Yuk.

The researchers also envision their technique may be used to manufacture drug capsules and surgical implants, containing cells engineered to produce compounds such as glucose, to be released therapeutically over time.

Air pollution cuts benefits of exercise in elderly: Study

New York, Dec 6 : Even a two-hour exposure to air pollution mainly in the form of traffic exhaust can wipe out the positive health benefits of walking on the lungs and hearts of the elderly, researchers have warned.

The findings showed that even short-term exposure to traffic exhaust can have negative effects on both healthy people, as well as those with pre-existing cardiorespiratory conditions such as chronic obstructive pulmonary disease (COPD) or coronary disease.

The study comes at a time when north India is facing a serious crisis due to rising levels of pollution.

"This adds to the growing body of evidence showing the negative cardiovascular and respiratory impacts of even a short, two-hour exposure to motor traffic pollution," said Junfeng "Jim" Zhang, Professor at Duke University in North Carolina, US.

On the other hand, people who walked for two hours in a large city park -- away from direct exposure to street-side traffic fumes -- reduced arterial stiffness by more than 24 per cent in healthy and COPD volunteers and more than 19 per cent in heart disease patients.

However, those who got exposed to pollution experienced a maximum reduction of just 4.6 per cent in arterial stiffness, 16 per cent reduction in COPD and an 8.6 per cent reduction in heart disease.

"For many people, such as the elderly or those with chronic disease, the only exercise they very often can do is to walk," added Fan Chung, Professor at the Imperial College London.

The study, published in The Lancet, highlights the need for stricter air quality limits and better traffic-control measures in our cities as well as greater access to urban green spaces for people to exercise, the researchers said.

HAPPY RETURNS OF THE DAY

BIRTHDAY GREETINGS

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