

Spending on healthcare advertising in the US has almost doubled over the past two decades as companies compete for their share of the world's biggest healthcare market, according to a US study, Reuters wrote.

Exclusive

# Over 40% of diabetics prone to infertility

By Sadeq Dehqan

Head of the Iranian Neurological Association said more than 40 percent of people suffering from diabetes are susceptible to infertility.

In an exclusive interview with Iran Daily, Dr. Mehri Mehrad said the infertility problem in diabetics is not related to age.

She added those who have had the disease for more than five years may develop the complication.

She said diabetes can have effects on nervous and circulatory systems as well as endocrine glands, adding usually patients' nerves and peripheral vessels will be damaged by the disease.

She listed the main urologic complications in people suffering from diabetes as kidney failure, sexual problems, urinary tract infection, incontinence and incomplete bladder emptying.

Diabetics' potency will drastically decrease after some



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years and medications cannot completely make up for it, Mehrdad said.

"In one the latest treatments, known as platelet-rich plasma (PRP), the patient's blood is taken and after inserting growth hormones, is injected into their bodies. This method

helps cells in related parts to reconstruct themselves."

She said among the other diseases that can cause sexual and infertility problems are depression, Parkinson's disease, MS and intervertebral disc herniation.

Elaborating the incontinence

problems in diabetics, Mehrad said the nervous system functions normally in ordinary people and sends signals when they feel they have to urinate. But those suffering from diabetes do not have the feeling that their bladders are full due to the malfunction of their nervous

system.

Incontinence, she said, has other reasons too: "For instance, prostate disease and MS can also cause incontinence in men. Complications of giving birth in women can also lead to incontinence in women."

The head of the Iranian Neurological Association added the prostate in men older than 60 can lead to some complications.

"Abnormality in the prostate, depending on its size, is divided into malignant and benign. The benign prostatic hyperplasia (BPH) — also called prostate enlargement — after the age of 60, can lead to low blood pressure, difficulty in urinating and frequent urination."

These problems can be treated by receiving medications. In case the size of the prostate is larger than usual, surgery or laser therapy is performed, she added.

The malignant prostate enlargement is categorized as a form of cancer — one of the most common kinds of cancers in men.

This type of cancer can be diagnosed by taking prostate-specific antigen (PSA) test. In case the malignant prostate enlargement is diagnosed in its early stages of development, its spread can be contained. So it is recommended that men take this test every year after the age of 35.

## Study shows how specific gene variants may raise bipolar disorder risk

A new study by researchers at The Picower Institute for Learning and Memory at MIT finds that the protein CPG2 is significantly less abundant in the brains of people with bipolar disorder (BD) and shows how specific mutations in the SYNE1 gene that encodes the protein undermine its expression and its function in neurons.

Led by Ely Nedivi, professor in MIT's departments of Biology and Brain and Cognitive Sciences, and former postdoc Mette Rathje, the study goes beyond merely reporting associations between genetic variants and psychiatric disease. Instead, the team's analysis and experiments show how a set of genetic differences in patients with bipolar disorder can lead to specific physiological dysfunction for neural circuit connections, or synapses, in the brain, eureka!ert.org reported.

The mechanistic detail and specificity of the findings provide new and potentially important information for developing novel treatment strategies and for improving diagnostics, Nedivi said.

"It's a rare situation where people have been able to link mutations genetically associated with increased risk of a mental health disorder to the underlying cellular dysfunction," said Nedivi, senior author of the study online in Molecular Psychiatry. "For bipolar disorder this might be the one and only."

The researchers are not suggesting that the CPG2-related variations in SYNE1 are "the cause" of bipolar disorder, but rather that they likely contribute significantly to susceptibility to the disease. Notably, they found that sometimes combinations of the variants, rather than single genetic differences, were required for significant dysfunction to become apparent in laboratory models.

"Our data fit a genetic architecture of BD, likely involving clusters of both regulatory and protein-coding variants, whose combined contribution to phenotypy is an important piece of a puzzle containing other risk and protective factors influencing BD susceptibility," the authors wrote.

During years of fundamental studies of synapses, Nedivi discovered CPG2, a protein expressed in response to neural activity, that helps regulate the number of receptors for the neurotransmitter glutamate at excitatory synapses. Regulation of glutamate receptor numbers is a key mechanism for modulating the strength of connections in brain circuits. When genetic studies identified SYNE1 as a risk gene specific to bipolar disorder, Nedivi's team recognized the opportunity to shed light into the cellular mechanisms of this devastating neuropsychiatric disorder typified by recurring episodes of mania and depression.

For the new study, Rathje led the charge to investigate how CPG2 may be different in people with the disease. To do that, she collected samples of postmortem brain tissue from six brain banks. The samples included tissue from people who had been diagnosed with bipolar disorder, people who had neuropsychiatric disorders with comorbid symptoms such as depression or schizophrenia, and people who did not have any of those illnesses. Only in samples from people with bipolar disorder was CPG2 significantly lower. Other key synaptic proteins were not uniquely lower in bipolar patients.

"Our findings show a specific correlation between low CPG2 levels and incidence of BD that is not shared with schizophrenia or major depression patients," the authors wrote.

From there they used deep-sequencing techniques on the same brain samples to look for genetic variations in the SYNE1 regions of BD patients with reduced CPG2 levels. They specifically looked at ones located in regions of the gene that could regulate expression of CPG2 and therefore its abundance.

Meanwhile, they also combed through genomic databases to identify genetic variants in regions of the gene that code CPG2. Those mutations could adversely affect how the protein is built and functions.

The researchers then conducted a series of experiments to test the physiological consequences of both the regulatory and protein coding variants found in BD patients.

To test effects of non-coding variants on CPG2 expression, they cloned the CPG2 promoter regions from the human SYNE1 gene and attached them to a "reporter" that would measure how effective they were in directing protein expression in cultured neurons. They then compared these to the same regions cloned from BD patients that contained specific variants individually or in combination. Some did not affect the neurons' ability to express CPG2 but some did profoundly. In two cases, pairs of variants (but neither of them individually), also reduced CPG2 expression.

## Study: PTSD increases heart disease, cancer risk

Posttraumatic stress disorder (PTSD) was associated with cardiovascular disease and cancer, as well as the metabolic syndrome, in a new study.

In the Journal of Neuroscience Research study of 84 individuals diagnosed with PTSD (39 victims of terrorist attacks and 45 victims of other traumatic events), males were more likely to have circulatory and metabolic complications, whereas females had a higher prevalence of benign and malignant cancers, medicalxpress.com wrote.

A longer duration of PTSD was associated with the development of cardiovascular disease, while PTSD following terrorist attacks was associated with a higher cancer prevalence.

"An explanation of why victims of terrorism may have a higher cancer prevalence than victims of other traumatic events, such as accidents, may be the intentional infliction of harm on the victim causing a more dysregulated stress response. A challenge for the future is monitoring the physical health of victims over time and understanding psychological and neurobiological processes producing this effect," said coauthor Dr. Andrea Pozza, of the Santa Maria alle Scotte University Hospital, in Italy.

"Longer untreated PTSD was associated with higher prevalence of cardiovascular disease regardless of the event type: This suggests the importance of early intervention for PTSD and also education programs for the general population to make people aware about PTSD early warning signs and how to recognize them."

## Does this common food additive stop us from exercising?

A two-part study that examined both mice and humans revealed a strong link between inorganic phosphate, a food additive that is prevalent in the "Western diet", and a lack of physical activity.

Inorganic phosphate is present in processed meat and cola.

According to the latest statistics from the US Department of Health and Human Services, less than five percent of the country's adult population engage in 30 minutes of physical activity every day, medicalnewstoday.com reported.

Over 80 percent of US adults do not follow the recommended guidelines for aerobic exercise and resistance training.

Also, only one in three people manage to exercise for the recommended amount every week.

Why are US adults so sedentary? New research may now have found the culprit in a food additive present in meat, soda, and some processed foods: Inorganic phosphate.

Scientists at the University of Texas (UT) Southwestern Medical Center in Dallas examined the link between inorganic phosphate and sedentarism in both mice and humans.

Phosphate is a particle derived from phosphorus, a mineral that the body needs to "build and repair bones and teeth, help nerves function, and make muscles contract".

The researchers — led by Dr. Wanpen Vongpatanasin,

a professor of medicine at UT Southwestern Medical Center — published their results in the journal Circulation.

Manufacturers add phosphate to food in order to keep it fresh for longer and to enhance its flavor. The additive is most likely to be present in "processed meat, ham, sausages, canned fish, baked goods, cola drinks, and other soft drinks".



medicalnewstoday.com

Normally, kidneys control how much phosphate there is in the blood, and they help filter out the excess phosphate in the urine.

However, impaired kidneys may struggle to flush out excessive phosphate, which is why scientists have previously called the additive a "health risk" and called for

labeling the amount of added phosphate in foods.

Some studies have also shown that inorganic phosphate correlates with a higher risk of mortality among people with kidney disease.

Meanwhile, newer studies have found that even in the general population, excess phosphate is linked with a higher risk of cardiovascular death as well as death from all causes.

For their study, Vongpatanasin and colleagues fed two groups of healthy mice similar diets but, they gave one group of mice extra phosphate to a degree that is equivalent to that which US adults consume.

Up to 25 percent of US adults regularly consume between three and four times more phosphate than the recommended dose, say the researchers.

In the mouse experiment, 12 weeks of following a phosphate-enriched diet correlated with less time on the treadmill and lower cardiac fitness in the rodents.

The mice that consumed additional phosphate had an impaired fat-burning metabolism. Also, the researchers found that 5,000 genes that help process fat and aid cell metabolism were altered in these mice.

In the second part of the study, Vongpatanasin and team examined data on over 1,600 healthy people. The participants had worn fitness trackers for seven days, which allowed the scientists to monitor their exercise levels.

They found that higher levels of phosphate in the blood correlated with more sedentarism and less time "spent in moderate to vigorous physical activity".

## Program helps seniors continue to live independently

A program that combines home modifications with specialized counseling may help seniors disabled by aging stay in their homes longer, a new study suggested.

The program helped seniors regain independence and accomplish more activities of daily living, such as bathing, walking across a small room, dressing themselves, grooming, using the toilet and getting in and out of bed, researchers reported in JAMA Internal Medicine, Reuters reported.

"For someone to be able to age in place, it's important to work on both the home environment and also the person," said Sarah Szanton, professor and director of the Center on Innovative Care in Aging at the Johns Hopkins School of Nursing and the Johns Hopkins School of Public Health.

"With our program, a nurse and an occupational therapist

come into the home and address only what the older adult cares about," she said.

"They may want to sleep upstairs in their own bed instead of the La-Z-Boy downstairs or they may want to be able to go to the bathroom by themselves rather than having a grandson have to pull them up."

The hope is that this will allow seniors to stay in their homes and out of hospitals and nursing homes, Szanton said. Another goal is to prevent injuries like hip fractures and heart attacks, she added.

For a 12-month study, Szanton's team enrolled 300 seniors aged 65 and older who had difficulty with one or more activities of daily living. Half the group got up to \$1,300 worth of home improvements along with up to four one-hour visits from a nurse and up to six one-hour visits from an



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occupational therapist. The other half, the control group, received 10 one-hour home visits from a research assistant who helped seniors identify sedentary activities they would like to learn or enjoy, such as learning to use the internet, playing board games and listening to music.

Nurses helped seniors in the active treatment group learn strategies to help manage depressive symptoms and balance problems. Occupational therapists helped participants

to identify feasible ways to surmount physical limitations.

The home modifications included leveling and repairing flooring, stabilizing stairs, replacing the toilet with one that had a higher seat, installing grab bars and adding a second banister to help those with weak legs who wanted to go up and down stairs.

Szanton points to the case of an elderly man who got around his apartment in a wheelchair but wanted to be able to shave

standing up and to go outside to watch the birds without needing someone to pick him up and carry him over his back stoop.

"We put in grab bars where he shaved and at the back stoop so he could get out by himself and shave standing up," Szanton said. "Before that he only got out when he was picked up all the time. Now he can get out all the time."

The researchers interviewed the study volunteers about their inability to accomplish activities of daily living at the study's start and then again at five and 12 months. By the end of the study, those in the active treatment group were more likely to say the program made their lives easier (82.3 percent versus 43.1 percent), helped them take care of themselves (79.8 percent versus 35.5 percent) and helped them gain confidence in managing daily challenges (79.9 percent versus 37.7 percent).