Dementia: Best evidence yet on how lowering blood pressure cuts risk

ISLAMABAD: Observational studies have demonstrated a strong link between high blood pressure in midlife and an increased risk of dementia and cognitive decline. However, a recent meta-analysis involving over 17,000 older adults found that those with the lowest dementia risk had high blood pressure.

Randomized controlled trials have meanwhile produced mixed results on the effects of lowering blood pressure on dementia risk. Further investigation of the link between blood pressure and dementia risk is necessary to develop effective prevention strategies for the condition.

Recently, researchers analyzed five trials that tracked how different blood pressure-lowering treatments influence dementia incidence. They found that blood pressure-lowering treatments significantly reduced dementia risk.

"The study puts forward an individual participant data analysis of double-blind placebo-controlled trials that all used blinded expert adjudication of dementia according to standardized criteria," said Dr. Phillip Tully, PhD., registered psychologist and researcher at the University of Adelaide, not involved in the study.

"Consequently, this study constitutes the strongest evidence to date on antihypertensive drugs and dementia risk," Dr. Tully told Medical News Today. "The data obtained across multiple countries utilizing various antihypertensive drugs versus placebo suggests that irrespective of the type of antihypertensive drug, blood pressure lowering among individuals with hypertension is associated with lower dementia risk."

– Dr. Tully Blood pressure medications and dementia For the study, the researchers included five randomized, double-blind, placebo-controlled trials with 28,008 individuals at an average age of 69.1 years from 20 countries. All trials measured blood pressure at baseline, annual intervals, and follow-up. Data also included incident dementia, death, and stroke alongside baseline characteristics such as body mass index (BMI), smoking status, and education history. The study followed the participants for an average of 4.3 years and recorded 861 cases of dementia.

In the end, the researchers found that those who took blood pressure medications had a 13% lower risk of dementia.

The researchers noted that these results remained after accounting for factors including age, baseline blood pressure, and stroke history. The researchers noted that antihypertensive treatments did not affect cognitive decline. The researchers concluded that blood pressure-lowering treatments in late-mid and later life lower dementia risk.

Treating hypertension to prevent dementia When asked how lowering blood pressure may prevent dementia, Dr. Emil Tsai, Ph.D., M.A.S., chief scientist and C.E.O. of SyneuRx, and Professor at the Department of Psychiatry and Behavioral Sciences at the University of California, Los Angeles (UCLA), told MNT: "Blood pressure measures the force that is applied to arteries as blood is circulated through the body. High blood pressure or hypertension is a result of our blood vessels getting older and losing elasticity, causing the force of blood pushing against the walls of blood vessels to be consistently too high."

"High blood pressure causes strain on the blood vessels over time, this can cause the walls of arteries to become thicker and stiffer as well as narrower, this is called arteriosclerosis. This narrowing of the arteries can happen in the brain, causing a lack of nutrients and oxygen, which causes damage that prevents the brain from functioning properly," Dr. Tsai added.

"High blood pressure can also cause a patient to suffer a stroke. A stroke can cause brain cell death that may lead to the development of vascular dementia, the second most common form of dementia after Alzheimer's."

'Love hormone' oxytocin may improve cognitive impairment in Alzheimer's: According to a 2021 Alzheimer's Association report, estimates in the United States indicate that 6.2 million people age 65 and older are living with Alzheimer's disease (AD). The report suggests this number could grow to 13.8 million by 2060 unless effective prevention or treatment options emerge.

Currently, the cause of Alzheimer's disease is not fully understood. Yet some research suggests the accumulation of amyloid B peptides (AB) in the brain may play a role in the development of the disease.

Still, according to a 2022 National Institute on Aging (NIA) statement, AD is a complex disorder that may involve other cellular changes. In addition to AB accumulation, proteins including tau, TDP43, and alpha-synuclein may also be a factor. Moreover, inflammation, genetics, environmental factors, and vascular changes may also play a role. Currently, Alzheimer's treatment options are limited to medications that may help manage cognitive and behavioral symptoms associated with the disorder.

Now, a new study by researchers at the Tokyo University of Science found that a cell-penetrating oxytocin derivative administered in the nasal passages of memory-impaired mice reversed the rodent's cognitive impairment. Although the study used mice and not human participants, the findings suggest that oxytocin could potentially reduce the cognitive impairments associated with Alzheimer's disease. Oxytocin's role in reducing memory impairment

Oxytocin is a hormone responsible for bonding behaviors and romantic attachment. Hence, it's often referred to as the "love hormone." Oxytocin also plays a critical role in childbirth and nursing. In a previous study by the Tokyo University of Science researchers, the scientists found that oxytocin could reverse the effects of amyloid-beta (Aß) peptides in the hippocampus of mice. Building on these findings, the research team sought to examine the effects of oxytocin in Aß-induced memory-impaired mice. Specifically, the scientists wanted to determine whether oxytocin would influence spatial memory.

First, the scientists had the mice perform Y-maze and Morris water maze (MWM) tests to examine spatial working and spatial reference memory. The team also evaluated the rodent's locomotor activity using a multi-channel activity-counting system. Then, in one group of rodents, the team used intracerebroventricular (ICV) administration to deliver oxytocin to the brain tissue. Delivering oxytocin intranasally Because of the ICV technique's invasive nature and impracticality in a clinical setting, the scientists also used intranasal (IN) delivery to administer oxytocin in another group of mice. According to the study, peptides like oxytocin have poor blood-brain barrier permeability — meaning they can't easily enter brain tissue. Thus, the team used an oxytocin derivative containing cell-penetrating peptides and a penetration-accelerating sequence for the nasal delivery experiments.

In addition, the scientists labeled the derivative with fluorescein isothiocyanate so they could see how it dispersed in the brain tissue with imaging techniques. After the oxytocin-treated mice performed the spatial memory tests, the scientists discovered that the mice who received oxytocin through ICV administration showed improvements in memory in both the Y-maze and MWM tests. Implications for treating

In conversation: What makes breast cancer come back?

Millions of people live with breast cancer, the most common form of cancer worldwide — and also, in most cases, one of the most treatable. However, even after successful treatment, breast cancer can recur. How does breast cancer spread, why does it sometimes come back, and can lifestyle changes help improve the prognosis for people with a breast cancer diagnosis? We discuss these and other questions in our monthly podcast.

According to data from the World Health Organization (WHO), in 2020 alone there were 2.3 million womenTrusted Source globally who received a diagnosis of breast cancer. Men can also develop breast cancer.

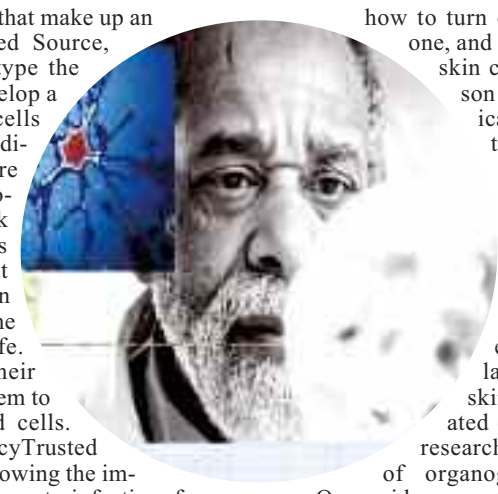
In the United States, approximately 264,000 womenTrusted Source and 2,400 men receive a breast cancer diagnosis each year, according to the Centers for Disease Control and Prevention (CDC). In the United Kingdom, there are about 55,500 new cases of breast cancer in women, and approximately 370 in men, as per Cancer Research UK data. Breast cancer is thus easily the most commonly occurringTrusted Source form of cancer, but it is also one of the most treatable. "The average 5-year survival rate for women in the [US] with non-metastatic invasive breast cancer is 90%. The average 10-year survival rate for women with non-metastatic invasive breast cancer is 84%," states the American Society of Clinical Oncology (ASCO) Foundation. However, there are many different types of breast cancer, some more aggressive than others, which spread more easily and can be more difficult to treat. But why and how does cancer spread from the initial tumor to other parts of the body?

And why does breast cancer sometimes come back, or recur, in people whose initial breast cancer treatment was successful? The current installment of our In Conversation podcast discusses these and other questions about breast cancer and recurrence risk. Our guests are Dr. Rachael Natrajan and Dr. Liz O'Riordan. Dr. Natrajan is head of the functional genomics team in the Breast Cancer Now Toby Robins Research Centre at the Institute of Cancer Research (ICR) in London. She specializes in the study of different breast cancer subtypes through the genetic analysis of cancer tumors, with a view to developing new treatments specific to each of these subtypes. **—AFP**

Why are scientists growing human brain cells in the lab?

Organoids — tissue cultures that roughly replicate the functions of an organ — allow researchers to observe how cells behave in tissues in vitro, in the lab. This is particularly helpful when it comes to investigating the brain and the conditions that affect it. But what are some of the ethical challenges?

After conception, the cells that make up an embryo are totipotentTrusted Source, and can turn into any cell type the body requires in order to develop a full human. "Embryonic cells within the first couple of cell divisions after fertilization are the only cells that are totipotent," explains New York State Stem Cell Science. This property narrows throughout development and as a human ages, but the body retains some stem cells throughout its life. Adults have stem cells in their bone marrow, which allow them to create many types of blood cells. This is known as multipotencyTrusted Source, which is crucial to allowing the immune system to stage a response to infection, for example. While they are able to differentiate into many different cell types, multipotent stem cells are not able to differentiate into all the different cells types that form the adult body. Being able to harness the ability to control the destiny of a stem cell has allowed researchers to investigate the minutiae of how our cells work in the lab, and arguably more ethically and practically than can be done in humans or animal models. Much research has been done into exactly how to turn one type of cell into another one, and is ongoing. Already blood and skin cells can be taken from a person and exposed to certain chemicals and media that allow them to regain their pluripotencyTrusted Source, the ability to develop into any cell type.



Called induced pluripotent stem cells, researchers are currently pursuing two main lines of work using this approach. They have created embryo models using fibroblasts, a type of cell found in the skin, for example. Recently created embryo models have allowed researchers to observe the beginning of organogenesis in the laboratory. Organoids are particularly useful when they can be used to create models of organs or tissues which cannot be easily replicated any other way. **—Agen-**

Hair follicles can now be grown in labs: What this means for hair loss

ISLAMABAD: The Hair Society of America reports about 35 million men and 21 million women experience hair loss in the United States.

While hair loss is a regular part of daily life — the American Academy of Dermatology Association reveals it's common to lose between 50 and 100 hairs each day — it can be traumatic and upsetting to notice thinning hair and bald spots on your head. Common remedies certainly exist, with tried and true options that can be prescribed by dermatologists or available over the counter to ease these concerns and bring back thicker, fuller hair. Now, research out of Japan sheds light on potential new methods for growing hair that can have implications for treating hair loss, animal testing, as well as drug screenings down the line. This new work saw researchers generate new hair follicles — those tube-shaped pores that hug the strand and root of a hair — in vitro in a lab. It's a development that experts say can both open pathways for better hair loss treatments and a clearer understanding of how hair follicles develop in general.

How hair loss treatments are determined While this new research offers a tantalizing picture of what could be possible if you are experiencing hair loss right now, what avenues currently exist? Dr. Peter Young is the medical director for Keeps, which specializes in treatment for men's hair loss by way of FDA-approved, home-delivered treatments. Young, who is unaffiliated with the new research out of Japan, said that it is all dependent on the type of hair loss you might be experiencing. You might be able to reverse this hair loss and grow new hairs, or just slow down the process at the least. To figure out what is the right method, Young said you have to figure out the cause of a specific individual's hair loss. "In order to determine the cause and best treatment for your hair loss, your provider will take a thorough history. focusing on the various medical conditions that can cause hair loss, including thyroid disease, anemia, and autoimmune conditions such as lupus," Young explained. "The provider will also inquire about physical or emotional stressors that may have led to your hair loss and request a list of your current medications."

Next, your provider will visually examine your scalp. This is due to the fact that different kinds of hair loss appear in different ways to the naked eye.

If the underlying cause is still unclear after this kind of examination, your provider might then recommend blood work and even take a biopsy of your scalp and look at that sample under a microscope, he added. "If your hair loss is caused by an underlying disease, such as thyroid disease or anemia, then treatment for that disease will be necessary to reverse the hair loss. There are various medications that can lead to hair loss, for example, certain blood pressure medications. If you're on one of these medications and experiencing hair loss, then your doctor may switch you to a different medication," Young said. **—Online**