

'New wave of Alzheimer's research' looks to the liver for clues



ISLAMABAD: In the race to gain a better understanding of the drivers behind Alzheimer's disease, one research team looks to the link between the brain, the gut, and the liver.

Alzheimer's disease is the most common form of dementia, affecting approximately 50 million people worldwide. Currently, there is no way of reversing the condition, and treatments focus on symptom management. This necessity is largely because researchers still do not know what exactly causes Alzheimer's or other forms of dementia.

Now, investigators from the Alzheimer's Disease Metabolomics Consortium (ADMC) at Duke University in Durham, NC, and the Alzheimer's Disease Neuroimaging Initiative (ADNI) have begun collaborating, looking for clues about Alzheimer's in a seemingly unlikely place: the liver.

The researchers decided to start taking liver function into account — in the context of Alzheimer's disease — because of the organ's role in the body's metabolic processes. In their new study paper, which appears in JAMA Network Open, the authors explain that, recently, specialists have increasingly begun to acknowledge a strong association between Alzheimer's disease and various forms of metabolic dysfunction.

"Metabolic activities in the liver determine the state of the metabolic readout of peripheral circulation," the authors explain in the study paper. "Mounting evidence suggests that patients with

Alzheimer disease display metabolic dysfunction," they continue, adding that the "evidence highlights the importance of the liver in the pathophysiological characteristics of [Alzheimer's disease]." In the current study, Prof. Kwangsik Nho — from the Indiana University School of Medicine in Indianapolis — and colleagues analyzed blood samples, assessing levels of enzymes they associated with liver function.

The blood samples came from 1,581 participants who also agreed to undertake brain scans, assessing for changes that indicated the development of Alzheimer's disease. Moreover, researchers also checked them for other signs of Alzheimer's, including cognitive measures, cerebrospinal fluid biomarkers, brain atrophy, and levels of beta-amyloid, a protein that forms sticky, toxic plaques in the brain in Alzheimer's disease.

In this way, the investigating team was able to identify associations between changes in liver function and markers of affected cognitive functioning in the brain.

"This study was a combined effort of the ADNI, a 60-site study, and the ADCM. It represents the new wave of Alzheimer's research, employing a broader systems approach that integrates central and peripheral biology," explains co-author Andrew Saykin. "In this study, blood biomarkers, reflecting liver function, were related to brain imaging and [cerebrospinal fluid] markers associated with Alzheimer's. No stone can be left un-

turned in our attempt to understand the disease and to identify viable therapeutic targets", Andrew Saykin.

First author Prof. Nho calls this approach "a new paradigm for Alzheimer's research."

He argues that, in the future, scientists may be able to identify different biomarkers of this condition in the blood, making diagnosis quicker and easier. "Until now, we only focused on the brain. Our research shows that by using blood biomarkers, we can still focus on the brain but also find evidence of Alzheimer's and improve our understanding of the body's internal signaling," says Nho. The researchers argue that to understand the causes of Alzheimer's disease better, as well as improve diagnosis and treatment, specialists should look at the brain as part of a system that influences — and is influenced by — different mechanisms in the body. "While we have focused for too long on studying the brain in isolation, we now have to study the brain as an organ that is communicating with and connected to other organs that support its function, and that can contribute to its dysfunction," says study co-author Rima Kaddurah-Daouk. "The concept emerges that Alzheimer's disease might be a systemic disease that affects several organs, including the liver," she adds. In the future, the current findings plus other related investigations may help perfect a more personalized approach to treating Alzheimer's, as precision medicine keeps on gaining ground. —Online

Does vitamin 'A' help reduce skin cancer risk?



ISLAMABAD: Vitamin A is a nutrient that is essential for maintaining good health, but could consuming it help lower the risk of skin cancer? One new study has found a link between vitamin A intake and reduced skin cancer risk.

A balanced diet requires, among other things, an appropriate intake of vitamins that are essential for health. One vitamin that humans need in order to stay healthy is vitamin A, which supports growth and development, as well as eye health, reproductive health, and skin health. Vitamin A is present in animal products, such as eggs and chicken, turkey, or beef liver. Animal-origin vitamin A is called retinol. This vitamin is also present in many fruits and vegetables, in the forms of beta carotene, alpha carotene, and beta cryptoxanthin. Some fruits and vegetables that are good sources of vitamin A are sweet potatoes, carrots, kale, butternut squash, pumpkin, broccoli, apricots, and papaya, to name but

a few. People can boost their vitamin A intake by taking dietary supplements, though adult males should not consume more than 900 micrograms of this vitamin per day and adult females should not ingest more than 700 micrograms per day. Though research has shown that vitamin A can help keep skin young and supple, it has remained unclear whether the vitamin can provide any further benefits for skin health.

Now, a study — from the Warren Alpert Medical School and the Brown School of Public Health, in Providence, RI, Harvard Medical School, in Boston, MA, and Inje University, in Seoul, South Korea — has investigated whether vitamin A intake could influence the risk of cutaneous squamous cell carcinoma, one of the most common forms of skin cancer. The findings appear in the journal JAMA Dermatology. According to the nonprofit organization and advocacy group Skin Cancer Foundation, "Squamous cell carcinoma

is the second most common form of skin cancer," with doctors diagnosing over 1 million new cases each year in the United States alone.

Because this form of cancer is so common, it is important to find better preventive strategies to lower people's risk of developing it.

In the current study — the first author of which is Dr. Jongwoo Kim — the researchers tried to find out whether there is any association between the intake of vitamin A and carotenoids and a lower risk of cutaneous squamous cell carcinoma. The team analyzed data from 75,170 women (with a mean age of 50.4 years) enrolled in the Nurses' Health Study and data from 48,400 men (with a mean age of 54.3 years) enrolled in the Health Professionals Follow-Up Study.

Over a follow-up period of more than 26 years, the researchers documented a total of 3,978 skin cancer cases among participants in both of these study

groups.

The researchers were also able to find out information regarding the participants' intake of vitamin A thanks to detailed surveys that the participants in the two study groups had filled out once every 4 years, approximately.

Based on their analysis, the researchers found that participants who were on the higher end of the spectrum, in terms of vitamin A intake, seemed to have a lower risk of cutaneous squamous cell carcinoma.

"In this large prospective study of U.S. women and men, we found that higher intake of total vitamin A, retinol, and several individual carotenoids, including beta cryptoxanthin, lycopene, and lutein and zeaxanthin was associated with lower risk of [squamous cell carcinoma]," the investigators write in their study paper. Most of the vitamin A in these cases came from food sources, especially vegetables, not from dietary supplements, the researchers add. —Online

How a dietary change might boost cancer therapy

ISLAMABAD: In a recent study, mice that ate a diet with reduced levels of a particular amino acid responded better to cancer treatments. The findings are intriguing, but the authors call for caution.

Doctors and other experts now understand the significant role that nutrition plays in health. In fact, it is possible to manage some conditions, such as diabetes and hypertension, through diet alone. However, the role of nutrition in preventing or treating cancer is not so clear cut. Jason Locasale, the senior author of a recent study, explains: "Cancer is, in many ways, more difficult, because it's different diseases with multiple forms, and often defined at a molecular level, so we're just beginning to understand how diet and nutrition are influencing that." Their paper, published in the journal Nature, looks at the role of an amino acid called methionine in cancer treatment.

What is methionine? Methionine is necessary for our cells to function. Experts refer to it as an essential amino acid because our bodies cannot make it. People need to take it in through the food that they eat. Many foods contain methionine, but meat and eggs contain particularly high levels.

This amino acid has intrigued researchers for many years. For instance, a study published in 1993 found that restricting methionine consumption extended the lifespan of rats. Later studies found a role for the amino acid in metabolic conditions. One of these studies showed that it could prevent diet-induced obesity in an animal model.

Some researchers have begun to examine its potential role in cancer treatment. Methionine piqued researchers' interest because it plays an important role in a cellular mechanism that some chemotherapy drugs and radiation therapy target. Scientists know this pathway as one-carbon metabolism. Also, some earlier studies have hinted that restricting methionine in the diet might have an anticancer effect. The authors explain: "We, therefore, reasoned that methionine restriction could have broad anticancer properties by targeting a focused area of metabolism and that these anticancer effects would interact with the response to other therapies that also affect one-carbon metabolism."

To investigate, the researchers used a

variety of cancer models. Firstly, they tested two types of treatment resistant cancer tissue taken from humans and grafted onto mice. When the scientists fed mice a diet with reduced levels of methionine, tumor growth slowed compared with mice fed a standard diet. When they looked into the metabolic details, as expected, they found that restricting methionine reduced tumor growth by hindering one-carbon metabolism. Next, the scientists used a common chemotherapy drug in combination with a methionine restricted diet. They used a low dose of the drug, which was insufficient to shrink the tumor. However, according to the authors, the low methionine diet combined with the drug led to a "marked inhibition of tumor growth."

When the researchers investigated a type of mouse sarcoma that does not respond to radiation therapy, they found that a methionine restricted diet alone was not sufficient to slow tumor growth. However, when these mice also received a dose of radiation, tumor growth was significantly slowed. In the next phase of their study, the scientists fed six healthy humans a diet with low levels of methionine for 3 weeks. They measured similar metabolic effects to those seen in the mice models. "This study suggests that dietary restriction of methionine induces rapid and specific metabolic profiles in mice and humans that can be induced in a clinical setting," senior author, Jason Locasale believes that "[b]y disrupting metabolic pathway with the dietary restriction of methionine, it might be possible to enhance the effects of chemotherapies that target these aspects of cancer metabolism." As the authors explain, these results are preliminary, and this approach might not be effective in humans or for all cancer types. In fact, they believe that methionine restriction could, perhaps, boost the growth of some cancers. In short, the researchers make it clear that this is not a call for people to become vegan. Although this type of dietary restriction will not reach the clinic for some time, this is an important step in understanding how diet can influence cancer growth. As the authors conclude: "This study may help to further establish principles of how dietary interventions may be used to influence cancer outcomes in broader contexts." —Online

Austria witnesses sharp increase in Covid-19 infections

Austria seeks its citizens to get vaccinated against the covid-19 as the Alpine nation is witnessing new surge in infections

VIENNA: Austria said only those vaccinated or cured from coronavirus would be allowed to frequent restaurants, hotels and cultural venues as the Alpine nation battles a surge in cases. The new rule takes effect with a four-week transition phase to incentivise people to get jabbed. Chancellor Alexander Schallenberg said. "No one wants to split the society, but it is our responsibility to protect the people in our country," he told a news conference. The EU member of almost nine million people recorded more than 9,300 new daily cases Friday, a fresh record for this year. Besides considering hospitals' ICU units filling up faster than

expected, tourism-dependent Austria also fears being backlisted by other countries because of the rapid virus spread. Some 64 percent of the population is fully vaccinated, which is below the EU-wide average of some 67 percent. Under the new rules, a negative Covid test will also no longer be sufficient for services with close contact such as at the hairdressers, and only those vaccinated and cured can attend gatherings of 25 people or more. The capital Vienna announced a similar rule due to come into effect next week. So far, more than 11,450 people infected with the new coronavirus have died in Austria. —AFP

