Health Matters

Beetroot juice can help reduce heart risk in women

After women go through menopause, their risk of heart disease increases dramatically. To improve and support heart and blood vessel health among postmenopausal women, researchers at Penn State studied whether beetroot juice can improve how blood vessels function. Results published recently indicated that daily consumption of beetroot juice by postmenopausal women may improve blood vessel function enough to reduce future heart disease risk.

Beetroot juice contains high levels of nitrate, which the body converts to nitric oxide. Nitric oxide helps blood vessels expand, making it easier for blood to flow through the circulatory system. The ability of nitric oxide to widen blood vessels is known to be particularly helpful during periods of limited blood flow and oxygen delivery, such as during a heart attack, according to the researchers.

David Proctor, professor of kinesiology and physiology at Penn State, and Jocelyn Delgado Spicuzza, who earned her doctorate in integrative and biomedical physiology from Penn State in May, led an interdisciplinary team of researchers who tested how nitrate-rich beetroot juice impacted blood vessel health in 24 postmenopausal women in their 50s and 60s.

"After menopause, women no longer produce estrogen, which helps maintain nitric oxide in the body," said Delgado Spicuzza, first author of the research and current SAFE-T center research project manager. "This loss of nitric oxide production contributes to the substantial increase in heart disease risk for postmenopausal women. Foods that are rich in nitrate - especially beets - are being investigated as a natural, non-pharmaceutical way to protect the heart and blood vessels."

Nitrate is an approved food additive for some animal-based food products, such as processed meats. However, nitrate food additives and preservatives are strictly regulated due to their potential to cause cancer, according to Delgado Spicuzza. In contrast, plants like beets, spinach and lettuce naturally accumulate nitrate from the soil. These plant-based sources of nitrate have cardiovascular benefits because the human body can convert nitrates from plants to nitric oxide, which it cannot do with nitrate added to meats.

In this study, participants had their vascular function tested at the Penn State Clinical Research Centre and then consumed two 2.3-ounce bottles of beetroot juice as an initial dose, followed by one bottle every morning for a week. All participants consumed concentrated beetroot juice, with each serving providing as much nitrate as three large beets. A few weeks later, the participants drank beetroot juice with the nitrate removed.

Neither the researchers nor the participants knew which juice was being consumed at the time of testing. A day after their last dose, participants returned for testing of their vascular function. The researchers compared how well blood vessels expanded for each woman when they were and were not consuming the nitrate-rich beetroot juice.

The researchers used an ultrasound sensor to monitor how blood flowed through the brachial artery -- which is in the upper arm and supplies blood to the hands -- during a stress test in which blood flow was restricted in each participant's forearm for five minutes. When the restriction was removed, researchers measured how blood flow changed in the brachial artery again.

The results showed that consumption of nitrate-rich beetroot juice each day improved blood flow compared to when the participants drank nitrate-free beetroot juice. The researchers said that this level of improved blood-vessel function -- if it could be maintained over the postmenopausal years -- could significantly reduce the risk of heart disease. They said that long-term health benefits of beetroot juice have not been studied at this point, but the long-term benefits of nitrate-rich vegetables have been confirmed.

Social anxiety linked to depression in adolescents

Adolescents who experience higher levels of social anxiety symptoms are more likely to report increased suicidal thoughts and other depressive symptoms two years later, according to new research.

The University of East Anglia-led study sheds light on the pressing need for early interventions to address society anxiety in young people.

Lead author Dr. Kenny Chiu, Clinical Lecturer in Clinical Psychology at UEA's Department of Clinical Psychology and Psychological Therapies, said: "Social Anxiety Disorder (SAD) often begins during adolescence, manifesting as intense fear and discomfort in social situations.

"This study provides valuable insights into how social anxiety symptoms may convey risks to developing other important mental health issues if left unaddressed."

Second author prof Argyris Stringaris, professor of Child and Adolescent Psychiatry at University College London, said: "Our findings suggest addressing social anxiety early could be crucial in preventing the development of suicidal thoughts and other depressive symptoms."

Depressive symptoms one year into the study also partially explained the connection between early social anxiety and later depressive symptoms.

Last author Dr.Eleanor Leigh, MRC Clinician Scientist Fellow at University of Oxford and Honorary Associate Professor at University College London, said: "Our findings highlight that social anxiety plays a significant role in the persistence of depressive symptoms in adolescents."

The study builds on a meta-analytic review led by Dr Eleanor Leigh, Dr Kenny Chiu, and Dr Elizabeth Ballard, which highlighted the lack of longitudinal research looking at the relationship between social anxiety and suicidal thoughts in adolescents.

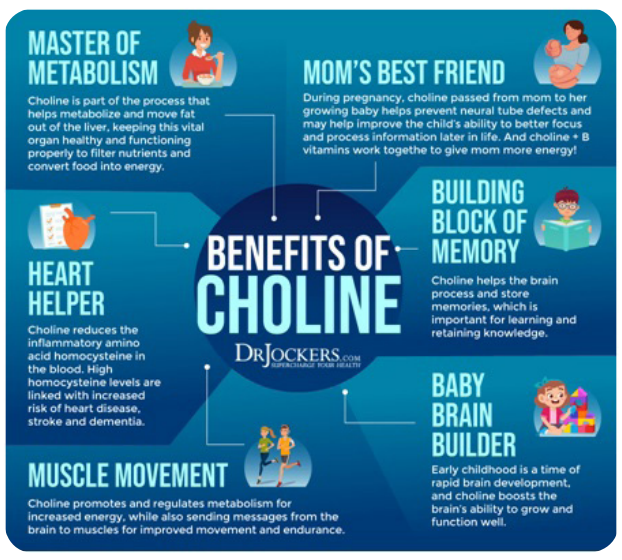
The study analysed data from the Wellcome Trust Neuroscience in Psychiatry Network (NSPN) 2,400 cohort dataset.

This accelerated longitudinal study recruited more than 2,400 young people aged between 14 and 24 from London and Cambridgeshire areas between 2012 and 2017.

Participants were assessed over a two-year period, once at the outset, another a year later, and the final one at the end of two years.

Dr. Chiu said: "Such a discovery would not have been possible without the NSPN consortium, which provides robust data accessible to child and adolescent mental health researchers."

Choline in cauliflower, broccoli lowers heart risks



Choline, an essential nutrient, is vital for creating important biological molecules such as acetylcholine, phosphatidylcholine, and sphingomyelin. These molecules play crucial roles in memory, mood, muscle control, and maintaining cell membrane integrity.

Due to limited endogenous synthesis, dietary intake of choline is necessary.

High-protein foods like beef, fish, milk, eggs, and certain vegetables such as cauliflower, broccoli, and Brussels sprouts are rich sources of choline.

One cup of cooked cauliflower provides 13% of the daily choline requirement, while the same amount of Brussels sprouts and broccoli each provide about 5%.

The relationship between choline and atherosclerotic cardiovascular disease (ASCVD) remains debated. Some studies link choline to increased cardiac risk via the trimethylamine N-oxide (TMAO) pathway, while others highlight its role in reducing cardiac hypertrophy through metabolic regulation.

Given that metabolic syndrome (MetS), affecting 20-30% of adults worldwide, raises the risk of ASCVD, myocardial infarction, coronary heart disease, and stroke, moderate choline intake could potentially mitigate these risks. To meet daily choline needs, a varied diet including meat, eggs, poultry, fish, dairy products, and cruciferous vegetables is recommended..

V.V.S. Manian

Promising role of anti diabetic drug in cancer control

Flinders University researchers have analysed how an antidiabetic treatment could help control the growth of tumours, potentially paving the way for the design of better cancer treatments.

The new study investigated what happens when metformin, a type 2 diabetes medication, is used to treat colorectal cancer cells, in the process demonstrating that it could be exploited to develop new cancer therapies.

Previous epidemiology studies show that taking metformin helps protect diabetes patients from developing some forms of cancer including bowel, or colorectal, cancer.

The Flinders' researchers sought to understand how taking metformin medication impacts cancer cells and how this could help with future cancer treatments."Using the latest techniques, we analysed how metformin helps to stop colorectal cancer cells from growing and multiplying by controlling certain 'pathways' inside the cells that help to regulate growth and division," says lead author Dr. Ayla Orang from Flinders University's College of Medicine and Public Health.

"Importantly, our work has pinpointed that metformin uses small pieces of RNA (called microRNAs) to act as a 'circuit breaker' and turn off certain genes that are involved in cell growth and division, so it is possible that our findings could eventually be used to develop a new targeted cancer therapy.

"In particular, we found that metformin increases the levels of certain microRNAs, like miR-2110 and miR-132-3p, which then target specific genes and slow down the growth and progression of tumours.

Clinical study supports safety of deep general anesthesia

General anesthesia makes it possible for millions of patients each year to undergo lifesaving surgeries while unconscious and free of pain. But the 176-year-old medical staple uses powerful drugs that have stoked fears of adverse effects on the brain -- particularly if used in high doses.

New findings of the American Medical Association (JAMA), however, support an earlier study that indicates that anesthesia is no more hazardous for the brain at higher doses than at lower doses, according to the researchers.

The new study reports results of a multicenter clinical trial of more than 1,000 older patients who underwent cardiac surgery at four hospitals in Canada. Researchers at these hospitals, in partnership with colleagues at Washington University School of Medicine in St. Louis, found that the amount of anesthesia used during surgery did not affect the risk of postoperative delirium -- a state that may contribute to long-term cognitive decline.

"Concern that general anesthesia harms the brain and causes both early and lasting postoperative cognitive disorders is a major reason that older adults avoid or delay life-enhancing procedures," said Michael S. Avidan, MBBCh, the Dr. Seymour and Rose T. Brown Professor of Anesthesiology and head of the Department of Anesthesiology at Washington University. "Our new study contributes to other compelling evidence that higher doses of general anesthesia are not toxic to the brain. Dispelling the misleading and pervasive message that general anesthesia causes cognitive disorders will have major public health implications by helping older adults make wise choices regarding essential surgeries, which will promote and sustain healthier lives."

The dose of administered anesthesia historically has been a carefully calculated balance between too little and too much. Administering an inadequate amount puts patients at risk of experiencing intraoperative awareness. Despite advances in anesthesia care, about 1 in 1,000 people still experience unintended waking during surgery without being able to move or indicate their pain or distress. This can lead to suffering and lifelong emotional trauma.

"The good news is that the distressing complication of intraoperative awareness can be more reliably prevented," said Avidan, the study's senior author. "Anesthesia clinicians can now confidently administer a sufficient dose of general anesthesia, providing a margin of safety for unconsciousness, without being concerned that this will put their patients' brains at risk. The practice of general anesthesia should change based on mounting reassuring evidence."

Previous smaller studies have suggested that too much anesthesia could be to blame for postoperative delirium, a neurological problem involving confusion, altered attention, paranoia, memory loss, hallucinations and delusions, among other symptoms. A common postoperative complication affecting about 25% of older patients after major surgeries, delirium can be distressing to patients and family members. It is typically temporary but has been linked to longer intensive care and hospital stays, other medical complications, persistent cognitive decline and higher risk of death.

To study the impact of minimising anesthesia on postoperative delirium, Avidan and colleagues previously conducted a similar clinical study in more than 1,200 older surgical patients at Barnes-Jewish Hospital in St. Louis. The researchers used an electroencephalogram (EEG) to monitor electrical activity in the brains of patients during major surgery and adjusted anesthesia levels to prevent brain activity suppression, considered a sign of excessive anesthesia levels. They found that minimising anesthesia administration did not prevent postoperative delirium.