

Protecting against stroke

Research shows that tocotrienols may help protect the brain against stroke damage and reduce the risk of a repeat stroke.

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HAVING a stroke can leave you with severe disability. It can strike anyone and affects 15 million people worldwide yearly.

You are at risk of getting a stroke if you have high blood pressure, high cholesterol, diabetes, atrial fibrillation (which produces an irregular heartbeat), are a smoker or heavy drinker.

When a stroke occurs, it can cause massive damage to the brain cells in the affected area and its surroundings, leading to cell death and dysfunction. And all this happens within minutes.

Getting a stroke also means you have a greater risk for another (recurrent) stroke.

However, you can take steps to prevent a recurrent stroke with a combination of lifestyle changes and medical interventions.

Statistics indicate that within five years of a first stroke, the risk for another stroke can increase to more than 40%.

Recurrent strokes often have a higher rate of death and disability because parts of the brain already injured by the original stroke may not be as resilient.

Hence, early protection for brain cells is essential.

Reducing risk

Numerous studies show that a little-known type of vitamin E called tocotrienols can protect the brain against stroke damage and reduce the risk of recurrent stroke.

According to tocotrienol researcher Prof Chandan K. Sen, brain damage during a stroke can be prevented by triggering the surrounding blood vessels to dilate and redirect the blood flow around a blockage.

The blood vessel "redirect" is the result of 10 weeks worth of supplementation with palm tocotrienols in a canine-stroke model study.

In this animal study, 20 dogs were divided to receive 200mg mixed tocotrienols or a placebo (palm edible oil without tocotrienols) daily for ten weeks prior to blocking their middle cerebral artery to simulate a stroke.

Animals that received tocotrienols experienced less overall brain damage, decreased loss of neural connections and improved blood flow to the affected area (from collateral vessels), compared to the placebo.

"For the first time, in a pre-clinical animal model, we were able to see something that we were never able to see in the mouse or the rat: that if you had a stroke and you had prophylactically taken tocotrienol, the area of the brain affected by the stroke received blood flow from the collaterals.

"These collaterals, which are an emergency response system, were activated when the blood circulation in the brain is challenged," explains the vice-chair for research at Ohio State University's Department of Surgery, who was in Kuala Lumpur recently.

Prof Sen and his colleagues discovered that tocotrienols could stimulate arteriogenesis – the remodelling of existing blood vessels that can immediately expand in response to a demand for oxygen-rich blood.

This collateral blood supply could provide a major difference in stroke outcomes.

People who have good collaterals have better recovery from strokes.

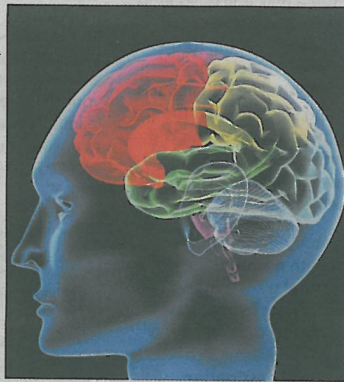
Currently, recurrent stroke prevention only focuses on blood-thinning drugs, which includes anti-platelets and anti-coagulants.

But mounting evidence suggests that for most patients with non-cardioembolic stroke or transient ischemic attack (TIA or "mini stroke"), anti-platelet agents are preferable to oral anticoagulants for secondary stroke prevention.

However, despite data supporting the use



As tocotrienols cannot be consumed in sufficient quantities for beneficial effects through our diet alone, they have been made available in pill form. — Photos: YAP CHEE HONG/The Star



The human brain, as illustrated in this filepic, needs sufficient oxygen and nutrients, supplied through blood, in order to work.

of anti-platelet agents, there is still much uncertainty regarding which anti-platelet agent – typically, either aspirin or clopidogrel – to use.

In addition, recent clinical testing has identified that up to 33% of stroke survivors are aspirin-resistant and 44% are clopidogrel-resistant.

Both are common medications prescribed for cardiovascular diseases.

"For patients taking these medications, many of them do not respond to these therapies – the therapy fails to inhibit platelet aggregation in vitro.

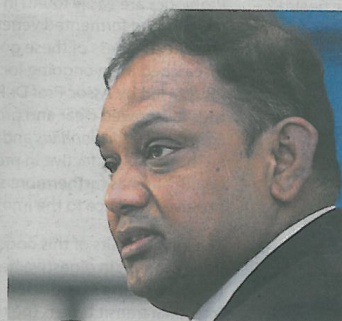
"The high statistics of aspirin and clopidogrel resistance drew my attention to looking into this area," says Prof Sen, who has been studying palm tocotrienols for around two decades.

Tocotrienols also have blood-thinning effects.

"There is clopidogrel- and aspirin-resistance, and if you add tocotrienol to that mix, it's likely to work better because it addresses the resistance."

The recommended dosage for tocotrienols is 200mg twice a day.

Prof Sen says, "You can add the palm



Prof Sen and his colleagues discovered that palm tocotrienols could stimulate arteriogenesis – the remodeling of existing blood vessels – in the brain to quickly help provide oxygen-rich blood to affected areas in a stroke.

tocotrienol factor in a responsible way when you're certain it's not harming the patient, to see if it helps.

"Everyone wants to see a solution.

"We've proven that with patients who just had a stroke, if they take another capsule – in this case, a tocotrienol supplement – it does not adversely affect them.

"This opens the big doors to the final showdown, which no palm tocotrienol study has ever done, that is our phase three FDA (the US Food and Drug Administration) trial."

This could be a scientific breakthrough that offers a favourable economic impact on medical cost related to stroke mortality and morbidity in the future.

Vitamin E family

Tocotrienols and tocopherol are the two members of the vitamin E family. Each has four different subunits: alpha, beta, gamma and delta.

The more commonly known form of vitamin E is tocopherol.

However, with continuing research, tocotrienols are fast emerging as the superior sib-

lings in the vitamin E family in providing the vitamin's full range of antioxidant properties.

Tocotrienols have unique neuroprotection properties, as well as 40 to 60 times more potent antioxidant properties, than tocopherol.

It is also a common component of a typical South-East Asian diet as it is found in rice bran, coconut oil, cocoa butter, barley, wheat germ and palm oil.

In fact, palm oil is one of the most abundant natural sources of tocotrienols, with about 75% of vitamin E in palm oil comprising of tocotrienols.

Therefore, can you get an adequate amount solely from your diet?

Unfortunately, no.

In nature, tocotrienols only occur at very low levels and it is impossible to obtain the amount required to obtain its beneficial effects with our normal diet alone.

You'd have to consume a cup of palm oil a day to get the level of tocotrienols required for therapeutic protection as described in most clinical studies.

"For those who don't have any diseases, taking tocotrienol will not hurt you.

"It's not a drug and has no risk of addiction.

"We don't get sick in a day. And if you look at life, all of us are heading towards one disease or another, so to be able to hold that back is important to decelerate the process.

"Some people would claim that just before you undergo surgery, don't take supplements, so I would recommend that you stop a few days before surgery because you don't want too much of blood-thinning," advises Prof Sen.

The scientist and his team have also found that topical tocotrienols may enrich the stem cell reservoir of the skin by inducing hair follicle proliferation. The study will be published soon in the *Molecular Therapy* journal.

In addition, there are emerging studies by Malaysian researchers suggesting that brain lesions in the ageing population have gone down with tocotrienol supplementation.

Many new horizons have unfolded in the use of palm tocotrienols, but those are stories for another time.