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## **Isoflavone dietary supplement improves the functioning of the arteries in stroke patients**

A dietary supplement containing isoflavone – a chemical found in soybeans, chickpeas, legumes and clovers – can improve artery function in stroke patients according to new research published online in Europe's leading cardiology journal, the *European Heart Journal* [1] today (Wednesday 24 September).

The study is believed to be the first randomised controlled trial to investigate the effects of isoflavone supplement on the way the brachial artery (the main artery in the arm) dilates in response to an increase in blood flow – a phenomenon known as flow-mediated dilation (FMD) – in patients with established cardiovascular disease. Brachial FMD is an indicator of the functioning of the cells that line the inner surfaces of blood vessels (vascular endothelium), and endothelial dysfunction is implicated in cardiovascular disease.

Professor Hung-Fat Tse, William MW Mong Professor in Cardiology and Academic Chief of the Cardiology Division in the Department of Medicine, Queen Mary Hospital, The University of Hong Kong (Hong Kong, China) and his team found that 12 weeks of isoflavone supplement, at a dose of 80 mg a day, significantly improved brachial FMD and, therefore, vascular endothelial dysfunction in patients who had suffered an ischaemic stroke (a stroke caused by blood clots or other obstructions).

“These findings may have important implications for the use of isoflavone for secondary prevention in patients with cardiovascular disease, on top of conventional treatments,” the authors wrote in their *EHJ* paper.

The trial was a double-blind, placebo-controlled trial, involving 50 patients taking the isoflavone supplement, and 52 taking a placebo pill. The researchers measured FMD by using ultrasound to record the performance of the brachial artery as the blood flow returned to normal after having a pneumatic tourniquet on the forearm inflated and then released. FMD was defined as the percentage change in the brachial artery diameter between its normal size (baseline) and one minute after the tourniquet's deflation.

Eighty per cent of the patients had an impaired FMD of less than 3.7% at the start of the study, but after 12 weeks of isoflavone or placebo, there was an improvement of one per cent in the isoflavone-treated patients compared with the controls.

Prof Tse explained: “Although the absolute increase in brachial diameter – one per cent – is small, the relative increase actually amounted to about 50% because the mean average FMD in these stroke patients was about two per cent. In fact, in patients with severe endothelial dysfunction, there might not be dilatation of brachial diameter at all.”

In their paper, the authors wrote: “The treatment effect of isoflavone in our study was comparable with lifestyle changes with endurance training or pharmacological interventions with statin therapy.”

In addition, the prevalence of impaired FMD after 12 weeks became significantly lower in isoflavone-treated patients than in the controls (isoflavone: 58%, control: 79%). There was also a greater effect in patients with more severe endothelial dysfunction.

“The patients who had a lower initial FMD were found, in general, to respond with a larger absolute increase in FMD after receiving 12 weeks of isoflavone intervention, compared to

patients who had a better baseline FMD in the first place,” said Prof Tse. “These findings suggest that isoflavone reverses endothelial dysfunction in this group of patients with cardiovascular disease. This has important clinical implications, as the benefit of the treatment is conferred to the group of patients with the highest risks for cardiovascular events, and this effect persists, even at this rather late stage of the cardiovascular continuum.”

No improvement from isoflavone treatment was found in diabetic patients compared with non-diabetic patients, but there was an improvement of one per cent in patients who were current smokers or who had smoked in the past compared with non- or never smokers. “Since smoking is known to be associated with more severe endothelial dysfunction, this observation was coherent with our hypothesis that patients with worse baseline endothelial function are, in general, more responsive to isoflavone treatment,” said Prof Tse.

The researchers also found that 12 weeks of isoflavone treatment resulted in a significant decrease in levels of high-sensitivity C-reactive protein. This protein increases during systemic inflammation and is an independent predictor of cardiovascular-related events. “These findings suggested that isoflavone treatment alleviated vascular inflammatory stress and was an important component that mediated the reversal of endothelial dysfunction in this group of patients,” wrote the authors.

Prof Tse said that the mechanisms by which isoflavone produces these changes in FMD were not completely understood. Other than the anti-inflammatory effect observed in this study, isoflavone is a major class of phytoestrogens – naturally occurring chemicals that mimic the effect of the human hormone oestrogen. Oestrogen is known to protect against heart disease and so this could be a possible mechanism.

He said it was too early to make clinical recommendations about the use of isoflavone supplements for stroke patients. “Our study implied that diets with higher isoflavone contents might be beneficial in reducing cardiovascular risk in ischaemic stroke patients. Since atherosclerosis is a generalised process, it might be reasonable to propose that a similar effect be observed in other kinds of CVD. However, specific response from different CVD-related conditions requires further testing. At this juncture, regular isoflavone supplement might not be advocated since the benefits and side effects of long-term supplementation are still unknown.

“A balanced diet is still the top priority in promoting health. Diets with higher soy content might be beneficial due to the isoflavone contents. These food products also, in general, have higher contents of polyunsaturated fats, fibre, vitamins and less saturated fat.”

Prof Tse and his colleagues are continuing with prospective studies of isoflavone to see what effect it has on clinical outcomes such as overall survival and the incidence of cardiovascular events.

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**Notes:**

**[1] Reduction of C-reactive protein with isoflavone supplement reverses endothelial dysfunction in patients with ischaemic stroke. European Heart Journal. doi:10.1093/eurheartj/ehn409.**

**A pdf of the full paper is available on request from Emma Mason or is available at: [http://www.oxfordjournals.org/our\\_journals/eurheartj/press\\_releases/freepdf/ehn409.pdf](http://www.oxfordjournals.org/our_journals/eurheartj/press_releases/freepdf/ehn409.pdf)**

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**Contact: (media inquiries only)**

Emma Mason: Tel: +44 (0)1376 563090 Mobile: +44(0)7711 296 986

Email: [wordmason@mac.com](mailto:wordmason@mac.com)

**ESC Press & PR Office (for independent comment):**

Tel: +33 (0)4 92 94 86 27. Fax: +33 (0)4 92 94 77 51. Email: [press@escardio.org](mailto:press@escardio.org)