

S'pore trial finds cholesterol drug can potentially treat diabetic eye condition

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Researchers in Singapore have found that fenofibrate, a drug used to treat high blood fat and high cholesterol, could also potentially

remedy a diabetic eye condition that could lead to blindness.

Diabetic corneal neuropathy, which is estimated to affect 47 per cent to 64 per cent of diabetic patients, occurs when high blood sugar levels injure and inflame nerves in the cornea – the transparent layer of the eye that covers the iris and pupil – and leads to eye irritation and decreased corneal sensation in mild cases.

But the disease is underdiagnosed, and tends to be detected only in rare cases when symptoms become severe – for example, when patients have corneal wounds that do not heal, corneal infections or perforations that could lead to blindness.

Besides lubricants and anti-inflammatory eye drops that help patients cope with symptoms, there are currently no treatments locally for the disease.

But that could change soon, with the work of 15 researchers from four institutions – the Singapore Eye Research Institute (Seri), Singapore National Eye Centre (SNEC), Singapore General Hospital (SGH) and Duke-NUS Medical School – who trialled fenofibrate in 30 patients for 30 days.

After giving the patients 100mg to 300mg of the drug each day, the researchers found that it helped to make the nerves in their corneas healthier. The findings were published in the journal *Diabetes* in November 2022.

Speaking to *The Straits Times*, Associate Professor Liu Yu-Chi, a clinician scientist at SNEC and Seri who led the study, said: “Fenofibrate was observed to help the patients in the trial through three ways: By reducing the inflammation and clotting of nerves in the cornea, by providing nutrition to the nerves in order to enable them to regenerate, and by regulating the metabolism of lipids in our body to lower lipid levels, which is a known risk factor for diabetic

neuropathy.”

Dr Tan Hong Chang, a senior consultant at SGH's department of endocrinology who was the co-author of the study, said: “For patients with diabetic corneal neuropathy, their corneal nerves are not healthy and tend to be fewer in number. The arrangement of the cells on the corneal surface is also disorganised.

“In this trial, we observed that fenofibrate was able to reverse these abnormalities, indicating that the nerves became healthier.”

The drug is also relatively affordable – a 200mg capsule costs just an estimated 85 cents to \$1.10 in Singapore. In contrast, a relatively new remedy – known as the nerve growth factor eye drop – which has been approved in Europe and the United States, costs around \$11,000 to \$63,000 a month.

Professor Thomas Coffman, dean of Duke-NUS Medical School, said: “The finding by the scientists brings hope of an affordable and safe treatment that can save people's eyesight, and promises to be a significant advance in our ongoing war against diabetes.”

The researchers will be putting the drug through randomised controlled trials involving at least 200 patients, where they hope to confirm their findings and find out what the optimal dosage and treatment duration are.

They are also trying to formulate the drug, which is now in the form of oral tablets, into topical eye drops, which could help to maximise the drug's efficacy.

Prof Liu said: “If fenofibrate is taken orally, it is actually dispersed to all parts of the body, so only a small proportion of it goes to the eyes. If it were applied as eye drops, the concentration of the drug in the eye would be higher, which would theoretically make the treatment more effective.”

She added that applying the drug in the form of eye drops could help



Associate Professor Liu Yu-Chi (left) and Dr Tan Hong Chang, together with their team, trialled fenofibrate in 30 patients for 30 days and found that the drug helped to make the nerves in the patients' corneas healthier. ST PHOTO: JOSIAH TEO

to minimise certain side effects that come from taking it orally, such as nausea, heartburn and diarrhoea.

The team hopes to seek approval for the commercial use of fenofibrate to treat diabetic corneal neuropathy in three to five years. In the meantime, it advises diabetic patients to continue their care regime with their usual doctor, and

urges more Singaporeans to go for diabetes screening.

On what he hopes his team's findings can achieve, Dr Tan said: “Reduce the symptoms due to diabetic corneal neuropathy, improve the patients' quality of life and minimise severe complications such as blindness.”

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