A faster way to detect eye disease

Researchers come up with software that can do the job automatically

By feng zengkun

A COMPUTER program devised by a group of researchers here could reduce blindness caused by severe myopia.

Their program is based on early and rapid detection of peripapillary atrophy (PPA), which is the degeneration of the retinal tissue at the back of the eyeball.

This structural abnormality can lead to a high risk of severe myopia later in life, which commonly leads to blindness.

Currently, only ophthalmologists and some optometrists can detect such changes from scanned images of the eye, but the process is time-consuming, tedious and subjective.

The researchers’ work was published last month in the science journal Transactions On Medical Imaging.

They believe their program can be used as a quick and automatic screening tool in hospitals here.

PPA is linked to eye diseases such as glaucoma, and studies show that most people who suffer from PPA will also develop severe myopia later in life.
Those who suffer from myopia, or short-sightedness, can see nearby objects clearly, while distant objects appear blurred. This is because the focal point of an image falls in front of the retina instead of directly on it, usually due to distortion to the eyeball.

Unlike simple myopia, which usually stops worsening after one's teenage years, severe myopia is a lifelong disease and is among the most common causes of blindness worldwide.

In Singapore, about 9 per cent of 40-to 80-year-old Chinese people suffer from severe myopia. The rate is about 4 per cent for Indians and Malays in the same age group. The myopia studies were led by Professor Saw Seang Mei, head of the myopia unit at the Singapore Eye Research Institute (Seri) and also a professor with the National University of Singapore's (NUS) Saw Swee Hock School of Public Health.

The computer program was a collaborative effort between the Agency for Science, Technology and Research's Institute for Infocomm Research, NUS' School of Public Health and Seri.

Tests on 672 eye images showed that the program identified PPA about 95 per cent of the time, by looking for abnormal shapes, colours and textures within the eye. PPA usually manifests itself as a greenish-grey crescent at the back of the eye. This widens and becomes whiter as the disease worsens.

Dr Jimmy Liu, acting manager of the ocular imaging programme at the infocomm institute, said the team plans to approach hospitals early next year to do further tests. The scientists also want to improve the program so it can detect other abnormal changes in the eye, such as damaged optic nerves or lesions on the eyeball.

"This will make it more useful for ophthalmologists, and can alert them to possible eye diseases at an earlier stage," said Dr Liu.