

## **Will artificial intelligence replace ophthalmologist in diabetic retinopathy screening?**

**Zhipeng You<sup>#</sup>, Xiaoqin Hu<sup>#</sup>, Ke Shi<sup>\*</sup>**

Department of Ophthalmology, the Second Affiliated Hospital, Nanchang University, Nanchang, PR China

<sup>#</sup>These authors have equally contributed to the work.

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### **Letter to the Editor**

Diabetic retinopathy is a common complication of diabetes and a serious eye disease that can cause blindness [1]. Due to the lack of symptoms at the early stage, many patients with diabetic retinopathy often have severe retinopathy when they seek treatment. Therefore, screening for diabetic retinopathy in the diabetic population is very important.

We read a paper titled “Development and validation of a deep learning algorithm for detection of diabetic retinopathy in retinal fundus photographs” published in “The Journal of the American Medical Association” [2]. In this paper, the authors designed an artificial intelligence diagnostic tool using a deep learning algorithm for identification of fundus of normal and diabetic retinopathy patients. This diagnostic tool yielded satisfactory results, with sensitivity values of 97.5% and 96.1% and specificity values of 93.4% and 93.9% in two test systems [2]. We are encouraged by this finding, but are concerned about the public expectation of the findings whether the emergence of such a revolutionary tool would replace ophthalmologist in diabetic retinopathy screening in the future.

We hold the opinion that artificial intelligence would act as an auxiliary part in diabetic retinopathy screening. Artificial intelligence plays a role mainly in medical image recognition and cannot replace the role of ophthalmologists in clinical diagnosis which usually require interpretation by ophthalmologists with relevant clinical experience. However, the incidence of diabetes has exhibited an increasing trend in recent years. Zhang et al. predicted that the global number of patients with diabetes would increase from 336 million in 2011 to 552 million in 2030 [3]. In this case, artificial intelligence can greatly ease the pressure in healthcare, especially in China and other countries with large populations, where the resources are insufficient for the screening of diabetic retinopathy due to the large number of patients with diabetes. Because of its low operation cost, artificial intelligence can be employed in early screening to reduce the rate of missed diagnoses of diabetic retinopathy in primary hospitals.

Furthermore, artificial intelligence could also be incorporated into mobile phones for real-time monitoring of the fundus *via* an external fundus camera module connected to the mobile phone and may provide services to patients at any time. This provides a convenient means for the general public to detect the disease at an early stage and seek professional help as soon as possible, which will avoid wasting medical resources.

In summary, the development of artificial intelligence will continue to generate progressive medical advances, and ophthalmologists need to learn how to utilize science and technology. We believe that artificial intelligence is not the “AlphaGo” that will eventually replace an ophthalmologist. It will be a helpful assistant instead.

### **References**

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### **\*Correspondence to**

Ke Shi

Department of Ophthalmology

The Second Affiliated Hospital

Nanchang University

Nanchang

PR China