



Jialiang Zhao

Roibeard O'hEineachain
in Vilamoura, Portugal

CHINESE ophthalmologists have achieved a high standard in diagnostic and surgical ophthalmic practice thanks to an increasing exchange of ideas and practices with the worldwide community of ophthalmologists, although challenges remain, said Prof Jialiang Zhao MD, president of the Chinese Ophthalmologic Society, in a keynote lecture at this year's meeting of the European Association for Vision and Eye Research.

China is the largest developing country in the world. With a population of 1.3 billion it is home to a fifth of the world's population and also home to nearly a fifth of the world's blind.

The estimated prevalence of blindness in the country is 0.5 per cent, or around 6.7 million people. An estimated 174 million people are visually impaired, said Dr Zhao, who is based at the Peking Union Medical College Hospital, Beijing.

Unlike western countries where retinal diseases are the main cause of blindness, cataracts are the commonest cause of blindness and visual impairment in China. As the population ages, the incidence of cataract and other conditions which affect vision is likely to increase, he added. At present, 18 per cent of the country's population are more than 50 years old and more than 120 million are over the age of 60. The average life expectancy is 71.8 years, he noted.

"In the new century we meet new challenges in Chinese ophthalmology. The cataract surgery rate is still very low and the ageing of the population will lead to increases in blindness and visual impairment. There is a great gap between the tremendous demand and service capability of eye care in China," Dr Zhao said.

Chinese ophthalmology's long history

Ophthalmology in China has a long history that stretches back over 3,500 years, but it has only been during recent decades that modern western ophthalmology has become firmly established in the country, Dr Zhao noted.

The earliest records of ophthalmology in China are in the form of inscriptions on tortoise shells from the Shang Dynasty (16th century BC). Later, in the Han dynasty (206 BC-220 AD) the earliest pharmacopoeia in Chinese traditional medicine, *Shang Han Za Bing Lun* by Zhang Zhongjing, the most famous of China's ancient herbal doctors, listed 17 kinds of drugs for eye diseases.

The medical book *Zhubing Yuanhou Zonglun* (General Treatise on the Aetiology and Symptoms of Diseases) by Chao

Yuanfang in the Sui dynasty (581-618) recorded several kinds of eye diseases. The procedure of the couching of the cataract was repeatedly described in the medical books written from that time on. The ophthalmic monograph *Yin-Hai Jing-Wei* (Essential Subtleties on the Silver Sea) was published in the Yuan dynasty in 1332.

From the 17th to the 19th century, missionary doctors such as Teun Terrenz (1576-1630) and Peter Parker (1804-1880) introduced western ophthalmology into China and established eye clinics. Monographs and books published during that era described many ophthalmic surgical instruments that are the prototypes of those in use today.

In the 1920s the Peking Union Medical College established its modern department of ophthalmology. The first department head, Harvey Howard MD invited the world's leading ophthalmologists of that era to the Peking Union Medical College, including Prof Ernst Fuchs and Ludwig von Sallmann from Vienna, and the American ophthalmologist Peter C Kronfeld MD, Dr Zhao noted.

The first eye and ear hospital in Mainland China was established in the western Chinese University in 1928. In the following decades several young Chinese ophthalmologists who had studied abroad in the US, Australia and Japan returned to practise in China, bringing with them the innovations of the time, he continued.

However, ophthalmology continued to suffer from a dearth of personnel and equipment, Dr Zhao stressed. By the 1950s there were still only 100 ophthalmologists in the whole of China, and these were based in the larger cities and had very simple equipment and facilities, he said.

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Modern China

The period of greatest expansion and modernisation of ophthalmology in China has occurred since the late 1970s when the Chinese government adopted a reformed and open policy, Dr Zhao pointed out. The result has been a two-hundred-fold increase in the number of ophthalmologists practising in the country and a parallel

increase in the number of ophthalmology departments and other eye care centres.

According to the national survey of ophthalmic resources for 2003, there are at present 23,000 ophthalmologists practising in China. They are based in over 2700 ophthalmic centres throughout the country. There are 1,410 departments of ophthalmology in national, university, provincial and prefectural hospitals, 1,995 in county hospitals and 174 in township hospitals. In addition there are 121 eye hospitals, and 11 institutes for prevention of eye disease. The number of private hospitals is also increasing.

Qualifying as an ophthalmologist in China requires eight years of medical training at one of the country's 123 medical schools, including a three to five year residency. It is also necessary to pass a national examination with guidelines established by the Chinese Ophthalmological Society (COS).

The COS guidelines are themselves based on the International Council of Ophthalmology's preferred practice patterns and process of care practice guidelines. Dr Zhao is currently directing a project designed to teach ophthalmologists in China how to incorporate the guidelines into their practices.

Modern techniques

Modern ophthalmic techniques that have been adopted in China include phacoemulsification and IOL implantation. At present more than 80 per cent of patients who undergo cataract extraction also undergo IOL implantation. Moreover, between 1988 and 2006, the number of cataract surgeries performed rose from 100,000 per year to 600,000 per year.

Other modern ophthalmic techniques now in wide use in China include autoperimetry, fundus fluorescein angiography, indocyanine angiography, ocular ultrasonography, and multifocal electroretinograms. In addition, laser treatment for glaucoma and retinal disease is becoming increasingly common in China. Refractive surgery is also becoming more popular. Over 600 centres in the country

now have excimer lasers and more than one million patients undergo PRK or LASIK every year.

In recent years ophthalmologists in China have also become very active in vision and eye research. The main focuses of research have been the genetics and epidemiology of eye disease, retinal degeneration and clinical trials.

Among the accomplishments of Chinese ophthalmologic research have been the discoveries of the association between the virulence gene HSF4 and congenital cataract and the mutation of the TIGR gene in Chinese glaucoma patients. Chinese researchers have also found an association between amblyopia and neurotrophic factors and NMDA receptors

Epidemiological studies include the Beijing Eye Study, a population-based cohort study in northern China to evaluate prevalence and demographic associations of visual impairment in an urban and rural population in northern China. A national survey of visual handicap is also in progress.

Among the findings of the latter study is the high prevalence of myopia in China. It showed that the prevalence of myopia increases between the ages of eight and 15 years, when it reaches 37 per cent in males and 55 per cent in females.

Meanwhile, there is also a massive programme for prevention of eye diseases under way. Already trachoma and vitamin A deficiency are now well controlled and there is now a new network for surgical treatment of cataract.

Another factor in the modernisation of Chinese ophthalmology has been the participation of Chinese ophthalmologists in international congresses around the world and the hosting of such congresses within China, Dr Zhao said. In addition, the COS has recently become affiliated with other international organisations such as the International Council of Ophthalmology (ICO), The International Federation of Ophthalmological Societies (IFOS) and the Asia Pacific Academy of Ophthalmology (APAO).

"The Chinese Ophthalmological Society fully recognises that our achievements would not have happened without the support of the wider international ophthalmologic community. We also recognise that a combined approach will benefit the development of ophthalmology in China. To this aim, the COS are making great efforts and look forward to working together with ophthalmologists all over the world," he concluded.

zhaojialiang@medmail.com.cn