Blindness and visual impairment due to retinal diseases

A global epidemic of diabetes mellitus

Diabetes mellitus is a chronic disease that occurs when the pancreas does not produce enough insulin, a hormone that regulates blood sugar. Diabetes may be insulin-dependent, which is typically of early onset, or non-insulin dependent, when the body cannot effectively use the insulin it produces (maturity onset diabetes). Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes. Diabetes may be insulin-dependent, when the body cannot effectively produce insulin, or non insulin-dependent, when the body produces enough insulin but cannot utilise it effectively.

This General Assembly, compared to others in the past, had retinal diseases as a cause of visual impairment and blindness higher up on the agenda. This article summarises the main points made in relation to retinal diseases, in particular the challenge of diabetic retinopathy.

General overview on retinal diseases

Diabetic retinopathy is increasing as a global epidemic. The main microvascular complication of diabetes in the eye is diabetic retinopathy (DR), which is found in almost 20% of newly diagnosed diabetic people. It is important to remember that diabetes is also a risk factor for cataract, so the retinopathy may only be evident once the cataract has been removed and a view of the posterior segment is possible.1

Diabetic retinopathy is increasing as a cause of blindness throughout the world and data presented at the meeting suggests that DR accounts for an estimated 5% of the 45 million blind people worldwide today.

Age-related macular degeneration (AMD)

AMD was another retinal disease discussed and highlighted as a growing concern. It is a disorder predominantly affecting people over the age of 60. It affects the central part of the vision, which is essential for detailed tasks requiring fine vision, such as reading and recognising faces.

By 2025, there will be twice as many older people worldwide as there were in 2000 (an increase from 606 million to 1.2 billion). Twenty-five years later, by 2050, the population of older people will be three times greater than in 2000, around two billion, and subsequently the number of people with AMD will increase significantly.

Figures presented by Serge Resnikoff suggest that AMD is already the third largest cause of blindness in the world, as it accounts for 9% of the 45 million blind people worldwide.

Treatment:

Unfortunately, although new and exciting treatment strategies have been demonstrated to be beneficial in the active ‘wet’ form of AMD (intravitreal injections of anti-vascular endothelial growth factor), they require repeated administration, are not curative, and are prohibitively expensive.

On the other hand, smoking is an established risk factor for AMD and tobacco control should be strongly advocated as a measure for the prevention of blindness. For example, in Australia, cigarette packets display a prominent warning saying: ‘Smoking causes blindness’. Currently, smokers represent 25% of the worldwide population. Resnikoff explained that, if this figure were to fall to 25% to 15%, this would avoid 100,000 cases of blindness.

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Retinal detachment (RD)
The annual incidence of RD is estimated at 10/100,000 per year, although there are regional variations. It was roughly estimated that, globally, 90 eyes are blinded by RD every hour.
Risk factors for RD are increasing age, myopia, and cataract surgery. All these risk factors are becoming more common.
Results from low-income countries show that many patients present only when they lose vision in both eyes. Delay in presentation was acknowledged as a significant problem in the management of RD. It is often due to inadequate primary eye care and to misdiagnosis. Thus, it was highlighted that all ophthalmologists should be trained to recognize and manage RD appropriately.

Secondary prevention: screening for diabetic retinopathy
As blindness from DR is preventable, if caught and treated early (before symptomatic visual loss), DR provides an excellent opportunity for secondary prevention strategies, such as screening.
A number of different screening models were discussed at the meeting.

Scotland
In Scotland, 24% of the population is obese – a figure second only to the US – and it is estimated that 3–4% of the population has diabetes. The model used for the national screening programme was a system of ‘gatekeepers’ on three levels, each with increasing expertise: a trainee screener (e.g. a nurse) assessed the presence or not of retinopathy, then a trained screener (e.g. an optometrist) assessed whether the patient with retinopathy needed to be referred for laser treatment, and this was confirmed by an ophthalmologist at the third level of screening.
However, this system is extremely costly and probably difficult to replicate in low- or middle-income countries. The automated grading of fundus photographs appears to be an exciting development, as it can reduce costs. One speaker mentioned a project comparing the cost-effectiveness of manual and automated grading for DR.

Fundus examination inside a screening van. INDIA

showed that, although manual grading was more accurate, it cost UK £4,000 (US $5,750) per additional case detected.6

India
The Aravind model in India uses a number of different methods to screen for DR. These range from screening for diabetes in the general population (nearly 230,000 screened) and then screening the suspects for DR, to using telemedicine facilities for patients known to have diabetes.

Telemedicine: Telemedicine was advocated as a tool to improve surgical expertise. In the UK, there are 300,000 people with diabetes, and 30% of these need laser treatment each year. However, this system is expensive. Telemedicine allows automatic generation of reports with possible treatment strategies.

Integration with other health sectors
Finally, all the speakers mentioned that services for retinal pathology needed to be better integrated with other health care sectors. This was a recurrent theme of the meeting.
Services are currently disjointed; for example, orthopaedic doctors perform leg amputations in patients with diabetes, but they do not refer these patients for an eye examination.
Speakers advocated a better integration of blindness prevention strategies into national diabetes programmes.

Diabetic retinopathy: key points
1. There is a need for better public education and awareness (through community stakeholders and media).
2. There should be better coordination between eye care personnel and other health care personnel (e.g. eye teams should liaise with physicians in health centres).
3. Diabetes registers should be maintained and kept up to date.
4. Barriers to the use of services should be identified. For example, in Tanzania, although the check-up was free, one-fifth of diabetic patients left the eye department after being given dilating drops and before being examined, because the waiting time was too long.

References