The Global Need for Screening in Diabetic Retinopathy & the Singapore Experience

By Dr Yeo Kim Teck, Senior Consultant, Singapore National Eye Centre

Reprinted with permission from Asia-Pacific Academy of Ophthalmology 2006 Publication, Leading Lights in the Asia-Pacific; Editor, Dr Lim KH.



A Local Solution and a Global Need

The International Diabetes Federation estimated that there are currently 194 million people with diabetes mellitus world-wide. This figure is expected to rise to 330 million by 2025.

With the expected increase in life expectancy, it is predicted that half of these will have some form of diabetic retinopathy. Orbis estimated that there are currently 5 million individuals in the world blind from diabetes.

The statistics in Singapore are no less mind-boggling. The prevalence of diabetes is 9% in Singapore residents between the age of 18 and 69 years. This figure is much higher (32.4%) in the 60 to 69 years age group. With such statistics, it is not surprising that diabetic retinopathy is an important health problem in Singapore.

In a study of 13,296 patients screened in a diabetic retinal photography (DRP) programme in 1992, 21.8% exhibited some form of diabetic retinopathy with half of them (10.8%) sight-threatening. Fortunately, improved awareness, better diabetes care and 15 years of eye screening have brought this figure to less than 5% currently.

Diabetic Retinopathy: The Ideal "Screenable" Disease

WHO (World Health Organisation) requirements for a "screenable" disease are that the disease to be screened must be an important health problem (which of course diabetic retinopathy is), there must be an acceptable screening procedure (retinal photography is simple, quick and painless), there must be safe and effective treatment for the condition detected (argon laser photocoagulation

has proven its worth) and finally, the benefits of screening and treatment must outweigh the cost of the screening programme.

This begs the question of why an easily available programme that will effectively fulfill all of the WHO's criteria for a "screenable" disease is not being exploited by health ministries worldwide. One can only surmise that perhaps there may be too many interest groups pulling in different directions or that in the name of short term expediency, the long term health problems simply get bulldozed aside or buried over.

Detractors have decried retinal photography (especially a single photography of each eye) on the basis that it is not comprehensive" enough. Some argued that the Gold Standard (as used in research) must be used (i.e.14 photographs per patient compared to a more practical two photographs per patient). In the "Polaroid" days that would have been prohibitively expensive, not to mention the amount of added human resources needed if that had been the model adopted in Singapore.

The Human Side of Diabetic Retinopathy

Hidden behind the statistics is a very human face. The DRP Programme was in fact inspired by a patient in her forties who was unfortunate to be in the throes and grasps of diabetes and its ugly complications. She had multiple medical problems including having to struggle with expensive dialysis.

Her last straw (almost) was when she was found to have advanced diabetic retinopathy which needed argon laser treatment. With tears in her eyes, she said in no uncertain terms that she would

10% to 20% of people with diabetes die of renal failure.

SPECIAL FEATURE

rather die than live with yet another diabetes-related complication. That mental image never left my mind.

Thankfully, she was to keep her sight and medical appointments for the next decade or so. You can say her distressed face launched perhaps a hundred retinal cameras in Singapore.

The Roots and Rooting for the DRP Programme

The opportunity to start an eye screening programme for those with diabetes came in 1990. The Ministry of Health, (MOH) recognising the potential impact of diabetes, convened a committee to prioritise diabetes care. When my departmental head asked if I would be interested, I jumped at the chance.

As a young fresh-faced registrar then, the only way I was going to be heard in a meeting amongst the "big shots" was to slip in a paper on a screening strategy. This was subsequently published as "Meeting the Challenges of Diabetic Retinopathy in the 90's" in the Singapore Medical Journal.

Six months went by before I received a call asking if I would be interested in working with the Primary Health Care Service to develop the screening programme. I remember being pointedly asked if I thought the programme will succeed.

Putting on a brave front, I ventured that I didn't see why the programme would not succeed - if I had the unflinching support of MOH!

To attribute the success of the DRP Programe to a few ophthalmologists alone (a few of my colleagues helped keep the programme alive in the initial difficult years) would be a gross injustice.

Administrators from MOH, the Primary Health Service, doctors, nurses, clerical staff and technicians alike kept the service going.

One person in particular stood out for his ultimate commitment to the programme. He was our first photographer who came into the picture because there were no funds for a professionally qualified photographer. He was a retired health attendant with no diploma in photography but only a consummate passion in recreational photography.

So strong was this man's belief that the DRP programme was important in eliminating the scourge of diabetes-related blindness that he literally died doing the job he loved and believed in.

At his wake his wife told me that he insisted on going to work despite feeling unwell as he wanted to make sure that his patients were looked after. He was in terms of paper qualifications, "unqualified". He was in terms of the organisational structure, right at the bottom of the ladder. Yet in terms of commitment and passion he was faultless. BERT (Business Environment Risk Intelligence) has consistently labelled the Singapore worker a world-beater for good reason. You can count this as "Uniquely Singapore".

The Dollars and Sense of Screening

Many screening programmes die out for the simple reason that they do not reach the masses they are intended for It is obvious that the cost of screening to the end-users is an important factor. A nationwide programme with scant regard to the dollars and cents involved and which caters only to the wealthier segment of the population is doomed to fail from the start. There will, of course, be a group who will demand and can afford "premium-care medicine"-an area Singapore excels in.

For the masses, however, affordability is a prime issue. For this very reason the cost of screening by retinal photography in the Singapore DRP Programme has been maintained at a subsided rate of \$5 (US\$3) since 1991 (Press Academy Urology, 2006).



Funding the DRP Programme: A Lesson in Austerity

In its infancy, the DRP programme was poorly funded. This is perhaps not entirely surprising as preventive medicine all over the world is often relegated to the bottom of the money barrel. We did not have the luxury of flying in an international authority or the "prudency" of an expensive, exhaustive

and extended pilot trial. We only knew there was a longstanding and simmering problem of those with diabetes not getting their eyes checked and that there was an urgent need to fix that.

When there was only enough funds to get a single retinal camera, the Primary Health Service decided to rotate the camera amongst the three participating polyclinics every four months rather than scuttle the programme. Happily, today the retinal camera is a standard equipment in all the polyclinics.

Over 13,000 screenings were done in the first two years of the programme. Currently over 1,000 screenings are done monthly in the two polyclinic clusters. Well over 150,000 screenings would have been done to date by the polyclinics, hospital diabetes centre,

Diabetes is the fourth leading cause of global death by disease.

Snapshots >>>>>>>>>>

SPECIAL FEATURES

optometrists, general practice clinics, Diabetic Society of Singapore and the National Kidney Foundation combined. By all accounts, this would still qualify as the largest on-going screening programme for diabetic retinopathy worldwide.

"Uniquely Singapore"

My brief was to write on the "Uniquely Singapore" aspect of the DRP Programme. What is "Uniquely Singapore" apart from this programme being the largest of its kind worldwide? No, we did not invent the retinal camera. Neither were we the first to use the retinal camera for diabetic retinopathy screening.

Perhaps our "uniqueness" was that we recognised a pressing need and plunged headlong into it. Perhaps it was because despite the various obstacles and difficulties in the beginning, the prime movers did not falter but instead rooted for the eye screening program and sustained it for the last 15 years.

When you consider the (disturbing) fact that even to this day there are no other nation-wide programmes on a similar scale or concerted efforts to do mass screening for diabetic retinopathy (including developed countries with high standards of healthcare), we can perhaps label this programme "Uniquely Singapore".

One may ask, if retinal cameras are so readily available and basic

to preventing blindness, relatively affordable, effective (as shown by numerous studies) and cost-effective (compared to the costs of rehabilitating a blind diabetic and the incalculable social cost of blindness) why is it not being adopted by the world?

It still surprises me that the programme in Singapore to this day continues to be the largest programme of its kind worldwide. Granted, Singapore is compact and easily accessible but so are many of the heavily populated and diabetes-prone cities, First World countries included. With technological advances, even remote regions can now have retinal screening programme linked in cyberspace with urban reporting centres.

Our pervasive DRP Programme is not just about being "number one" in the world. It is not to accord us the bragging rights. Rather, it is about helping the world to see that before long, such as in 2025, over 300 million people will be afflicted with diabetes and half of them will be at risk of diabetic retinopathy.

Our DRP Programme is simply about not turning a blind eye to a pressing need. No funds, no time, no resources, no interested people are really no good reasons for a simple programme that can potentially and significantly reduce perhaps the most devastating diabetes-related complication which is diabetic blindness. In short - just do it!