Diabetic retinopathy and the role of the general practitioners

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Diabetes causes blindness. We have heard or seen this many times. It seems like everyone (doctors, nurses, pharmacists and patients) knows that diabetes causes blindness. Then why is it that there are so many diabetics still going blind? Knowing and not doing anything to prevent blindness is akin to not knowing at all. General practitioners (GPs) need to play their role in preventing their diabetic patients from going blind.

This article is going to focus on diabetic retinopathy and the role of the GP in preventing blindness in these patients.

The role of the GP can be divided into two parts:
1. Creating awareness and educating patients regarding diabetic retinopathy; and
2. Ensuring that patients have yearly eye examination.

CREATING AWARENESS AND EDUCATING REGARDING DIABETIC RETINOPATHY
Here is some information that will be helpful in educating diabetics:

Epidemiology
Diabetic retinopathy (DR) is the most common complication of diabetes mellitus (DM), and it is also a major cause of blindness among working adults. WHO reported that 4.8% of cases of global blindness were due to DR.

Approximately 20% of adults aged above 30 years in Malaysia have diabetes, which equates to more than 4 million persons. At least 10% will likely develop visual impairment secondary to DR. The prevalence of DR is high; 20 years after diagnosis, more than 90% of patients with type 1 diabetes and more than 60% of those with type 2 diabetes will have some degree of DR.

The major risk factors for developing DR are duration of diabetes and severity of hyperglycaemia. Other important risk factors include hypertension and elevated serum lipid levels.

Data from the diabetic eye registry of the Ministry of Health (MOH) of Malaysia, which registers patients with DM, showed that 36.8% of patients had DR and 14.7% had sight-threatening DR. The National Health and Morbidity Survey (NHMS) 2006 showed that 55% of patients with diabetes had never undergone an eye examination.

Early detection by undergoing a yearly eye examination and early treatment is the best way to prevent blindness due to DR.

Pathophysiology and classification
High blood sugar causes vascular
endothelial dysfunction resulting in loss of endothelial cells and pericytes. The retina then develops micro-aneurysms, intraretinal haemorrhages, and focal areas of retinal ischaemia (cotton-wool spots). At this point, the retinopathy is classified as non-proliferative DR (NPDR).

As the retinopathy progresses, the vessels become further damaged, resulting in retinal non-perfusion and more widespread ischaemia. Clinically, the retina can have signs of vascular damage including venous beading, intraretinal microvascular abnormalities, and more severe haemorrhages. At this point, the retinopathy is classified as severe NPDR. Even at this stage, most patients are asymptomatic.

With further ischaemic injury, compensatory chemical mediators, most notably vascular endothelial growth factor (VEGF), induce the growth of fragile new blood vessels at the inner surface of the retina. This stage, called proliferative diabetic retinopathy (PDR), is characterised by neovascularisation of the optic disc and neovascularisation elsewhere. When these fragile vessels bleed, the vitreous haemorrhage causes symptoms of ‘floaters’ or, if severe, loss of vision. Over time, the new vessels fibrose and can contract, resulting in tractional retinal detachments, which can cause significant vision loss.

Macular oedema, the leading cause of vision loss among patients with diabetes, can occur at any stage of diabetic retinopathy. Damaged
retinal vessels result in increased vascular permeability, causing an accumulation of intraretinal fluid and/or lipid. The retina appears thickened and may contain yellow hard exudates (lipid). Macular oedema causes symptoms of blurry vision.

Terms such as endothelial dysfunction, non-perfusion and ischaemic injury and vascular permeability may not be understood by everybody. However, a simple way of explaining the two mechanisms that cause blindness in diabetics is as follows:

1. **Occlusion**
   Occlusion of blood vessels causes hypoxia, which results in new vessel formation (Figure 1). These new vessels bleed easily resulting in vitreous haemorrhage and blindness. Early detection of new vessels followed by laser treatment causes regression of new vessels, thus preventing vitreous haemorrhage and blindness.

2. **Leakage**
   Leakage from blood vessels spreads to macula causing macula oedema and resulting in vision loss (Figure 2). Early detection and treatment can prevent macular oedema and vision loss. The majority of diabetics lose vision from maculopathy while a smaller proportion from proliferative diabetic retinopathy.

When explaining DR to diabetics, first show them the two pictures in Figure 3 and explain to them where
the cornea, lens and retina are. Then tell them that the macula is the most important part of the retina for vision. They will start to lose their vision when the leaking affects their macula. If there is any leaking in the other parts of the retina, their vision will still be clear.

EARLY DETECTION OF DR BEFORE VISION LOSS
In early stages, there is leakage but the patient will not be aware, as vision is still clear because the leakage is away from macula (Figure 4). These patients will need more regular eye examinations (3-6 monthly) and focal laser treatment given to prevent the leakage from spreading to the macula. In this way, we can prevent blindness in patients.

LATE DETECTION OF DR AFTER VISION LOSS
Most patients present to the ophthalmologist after they have lost some amount of vision (Figures 5 and 6). At this stage, focal and grid laser treatment is just to arrest the progression of the maculopathy and maintain present vision. It is difficult to regain lost vision.

However, in recent years, intravitreal anti-VEGF injections have helped patients to regain some amount of lost vision. However, this treatment is expensive and costs between RM4,000 and RM6,000 per injection. Some patients may need up to six injections in the first year. Therefore, it is very important for diabetic patients to have a yearly eye examination.

In the above few cases, the question is: Did diabetes cause their blindness? The answer is – no, diabetes does not cause blindness. When diabetic patients are told that diabetes does not cause blindness, they are shocked. How can that be? The answer...
Here are a few tips that may be helpful.

- The longer the duration of diabetes, the higher the risk of DR. Start today – make sure that every diabetic goes for regular eye examinations.
- Ask your diabetic patients the month of their birthday. Tell them to treat themselves to an eye check up every year during their birthday month.
- Ask your patients whether they have any blurring of vision.
- Check your patients’ vision. If their vision is blur or decreasing, advise them to see an eye specialist (it may be little late but the eye specialist may still be able to save some sight).

THE GP’S ROLE IN PREVENTING DR

The GP can advise patients to maintain acceptable glucose, blood pressure, and cholesterol levels by encouraging medication adherence.

The GP can also help with patient education and counselling on the importance of regular and proper diet and exercise. In addition, the GP must inform and advise the patients regarding DR.

First of all, the GP has to create awareness regarding DR and blindness. The next step is to educate and counsel them. Finally, the GP has to ensure that the patients have their annual eye examination.

These are value-added services that will benefit and save the vision of diabetic patients.

Once again, diabetes does not cause blindness if we ensure that all the diabetics under our care have their eye examination. Health professionals working together can make a difference and save the sight of diabetics.

These are some simple things that GPs can do. Statistics do not lie. There are just too many diabetics who have unnecessarily become blind. Some are doing whatever needs to be done, but we all can do that little bit extra.

PREVENTING UNNECESSARY BLINDNESS

As has been stated earlier, blindness in diabetics is not caused by diabetes, but by failure to go for regular eye examinations.

With the incidence of diabetes rising, the number of patients with sight-threatening DR is going to increase and more diabetics are going to go blind. More awareness to these issues may be created during World Sight Day and World Diabetic Day, but more has to be done to save the vision of diabetics.

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REFERENCES


Not all products and/or indications mentioned in this article are available and/or approved for use in all countries. Please refer to the specific prescribing information that may be found in the latest MIMS.