Management of Diabetic Retinopathy

A Joint Effort Of WDF And Aravind

World Diabetes Foundation

Aravind Eye Hospitals & Postgraduate Institute of Ophthalmology
Dear Doctor

This booklet contains information about your role as a physician in preventing blindness in your diabetic patients.

You are the first point of contact for your diabetic patients. You see them often . . . they trust you, count on your advice and support . . . and look up to enable them cope with the disease.

This is where you, dear doctor, can make all the difference to your patient. Being at the right place and right time obviously makes you the right person to make a positive impact on them - their eyes and in the quality of their lives.

You can help by
- Educating your diabetic patients about their increased risk of visual loss because of the disease
- Explaining to your patients the need for regular eye Examination by an ophthalmologist
- Counselling your patients about the importance of early detection of diabetic retinopathy and timely treatment in protecting their vision

It is imperative that the physicians and ophthalmologists work together to control diabetic retinopathy.

Together, we can make a difference.

Looking forward to your support

Dr. P. Namperumalsamy
WDF-Aravind Diabetic Retinopathy Project

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**MAGNITUDE OF DIABETIC EYE DISEASE IN INDIA**

- Increasing incidence of diabetes mellitus poses a major health problem in India. It was the 17th cause of blindness 20 years ago in India, but today it has ascended to the 6th position.
- Diabetic patients are twice as likely to develop eye problems than nondiabetic patients.
- 50 percent of diabetic patients develop some degree of diabetic eye disease.
- The risk of blindness is 25 times higher in diabetic patients.
THE NORMAL EYE

The human eye is the smallest; yet the most detailed and complex organ.

A HEALTHY RETINA

The macula is responsible for sharp, central vision.
The retina is nourished by healthy blood vessels which bring nutrients and oxygen.
The optic nerve carries impulses to the brain where they are converted into visual images.
The periphery, or outer part of the retina is responsible for peripheral vision.

The delicate retinal tissues of the eye convert light into impulses. These impulses are carried to the brain, which converts them into visual images. Different parts of the retina such as the periphery, macula, blood vessels and the optic nerve are responsible for different aspects of vision.

DIABETES AND THE EYE

DIABETIC RETINOPATHY

Diabetes produces weakening of the blood vessels in the body. The tiny delicate retinal blood vessels are particularly susceptible. This weakening of retinal blood vessels, accompanied by structural changes in the retina is termed as diabetic retinopathy. In diabetic retinopathy, the retina blood vessels may go through a series of changes like leakage or closure. These changes may progress from one to the next.
TYPES OF DIABETIC RETINOPATHY

There are two main categories of diabetic retinopathy:

Non proliferative diabetic retinopathy (when the blood vessels leak and then close), and proliferative diabetic retinopathy (when new blood vessels grow or proliferate).

NON PROLIFERATIVE DIABETIC RETINOPATHY (NPDR)

In nonproliferative diabetic retinopathy (also called background retinopathy), the retina may contain capillary leakage, capillary closure, or a combination of the two.

PROLIFERATIVE DIABETIC RETINOPATHY (PDR)

Progression to proliferative retinopathy is common in long standing diabetes. Besides having non proliferative retinopathy, there may be vessels growing on the retina, and the complications that stem from them.

EYE EVALUATION IN DIABETIC RETINOPATHY

Diabetic retinopathy can progress rapidly without much warning. Hence periodic eye examination is the only way to monitor the progression of disease and one can tackle vision threatening problems before further damage can occur.

1. RECORDING PATIENT’S HISTORY

The onset of diabetic retinopathy is related to the duration of diabetes. Hence the ophthalmologist asks the patient about the duration and family history of diabetes. Any history of eye problems is also looked into.
2. VISION
The goal of the eye examination is to evaluate and improve vision, if possible.

3. DIAGNOSING DIABETIC RETINOPATHY
Diagnostic tools such as a slit lamp, ultrasound and procedures like fluorescein angiography are used in addition to an ophthalmoscope to assess whether a patient has diabetic retinopathy or other eye problems.

FLUORESCEIN ANGIOGRAPHY
This is a magnified photography of the retina involving the use of an injectable dye. It helps to classify the condition and to record changes in the retinal blood vessels. The first angiogram is usually done during the first evaluation. Subsequent angiograms may be done to assess the progression of diabetic retinopathy and to decide on the mode of treatment.

TREATMENT OF DIABETIC RETINOPATHY
Lasers are widely used in treating diabetic retinopathy. It can slow down the progression of diabetic retinopathy and can stabilise vision. Research in developed countries has established that laser is the only treatment for diabetic retinopathy. No medical treatment is available for retinopathy separately other than good blood glucose control. Laser is an intense and highly energetic beam of light that emerges from a light source and is focused on the retina. Absorption by the retina will either seal or destroy the abnormal vessels.

PATTERNS OF LASER TREATMENT
Laser treatment reduces swelling by sealing the weak leaking vessels in the retina. It also regresses the new vessels hence prevents or stops bleeding.
Laser treatment in diabetic retinopathy is of three types:
• Focal treatment
• Grid treatment
• Panretinal treatment

THE LASER EXPERIENCE
Laser treatment usually done in an out-patient setting. The patient is given topical anaesthesia to prevent any discomfort. The patient is positioned before a slit lamp. The ophthalmologist guides the laser beam precisely on the target, with the aid of a slit lamp and a special contact lens. Additional treatment may be required depending on the patient’s condition. Lasers can also be delivered through an indirect ophthalmoscope.

SIDE EFFECTS
Some patients experience side effects after laser treatment. These are usually temporary. Possible side effects include watering of eyes, dilated pupils, mild headache, double vision, pain and mild blurring of vision. If these side effects persist or worsen one should contact an ophthalmologist immediately.
VITRECTOMY
In some patients, there may be bleeding into the vitreous or the vitreous may pull on the retina reducing vision severely. In such instances a vitrectomy (removal of the vitreous) is the choice of treatment. A vitrectomy is done only after other forms of treatment have been tried and failed to control the progression of disease or progression of visual loss.

THE IMPORTANCE OF REGULAR EYE CARE
Screening guidelines for detailed medical eye examination for persons with diabetes

<table>
<thead>
<tr>
<th>Age of onset of diabetes mellitus</th>
<th>Recommended time of first eye examination</th>
<th>Routine minimum follow-up</th>
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<tbody>
<tr>
<td>0-30 years</td>
<td>Within 5 years of diagnosis</td>
<td>Yearly</td>
</tr>
<tr>
<td>31 years and above</td>
<td>Upon diagnosis</td>
<td>Yearly</td>
</tr>
<tr>
<td>During Pregnancy</td>
<td>Early in the first trimester</td>
<td>3 months</td>
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<tr>
<th>Observed Retinal Abnormality</th>
<th>Follow-up</th>
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<tbody>
<tr>
<td>None or rare microaneurysms</td>
<td>Yearly</td>
</tr>
<tr>
<td>(5% to 10% one-year incidence of developing retinopathy)</td>
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</tr>
<tr>
<td>Mild non proliferative diabetic retinopathy (12% four-year incidence of developing macular edema)</td>
<td>Every 9 Months</td>
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<tr>
<td>Moderate NPDR (23% four-year incidence of developing macular edema)</td>
<td>Every 6 Months</td>
</tr>
<tr>
<td>Severe NPDR (10% to 50% one-year incidence of developing Non proliferative diabetic retinopathy)</td>
<td>Every 4 Months</td>
</tr>
<tr>
<td>Diabetic Retinopathy with clinically significant Macular Edema occurring at any level of retinopathy</td>
<td>Every 2-4 Months* (careful Follow-up)</td>
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<tr>
<td>Proliferative diabetic retinopathy (PDR)</td>
<td>Every 2-3 Months* (careful Follow-Up)</td>
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Diabetic Retinopathy is symptomless until the last stage. Once the symptoms show up, it is often too late to prevent visual loss. Hence all diabetics must visit the ophthalmologist once in a year to monitor the retina and watch for diabetic retinopathy. Once it is diagnosed, they may need more frequent visits to check the progress of the disease and get treated.
World Diabetes Foundation - Aravind Diabetic Retinopathy Project uses Appropriate Technology in Coimbatore, Tirunelveli, Theni and Madurai Districts of Tamilnadu and Pondicherry, India, to treat and control Diabetic Retinopathy.

PROJECT ACTIVITIES

ARAVIND EYE HOSPITAL - COIMBATORE, TIRUNELVELI & PONDICHERRY
- Awareness creation in association with diabetologists by establishment of diabetic resource centres.
- Screening for diabetes and diabetic retinopathy in the community.
- Provide appropriate treatment in the form of lasers, follow-up and surgery.
- Tele-transmission of digital images to reading and grading centre for expert consultation.

ARAVIND EYE HOSPITAL - THENI
REMOTE RURAL SCREENING CENTRE
- Tele-transmission of digital images to reading and grading centre for expert consultation
- Model for general ophthalmologists to treat diabetic retinopathy
- Epidemiology survey on diabetic retinopathy

ARAVIND EYE HOSPITAL - MADURAI
MOBILE SCREENING UNIT
- Mobile screening van covering camps, hospitals, etc.
- Digital transmission of images to reading and grading centre in Madurai through VSAT

READING AND GRADING CENTRE FOR DIABETIC RETINOPATHY
- Reading and Grading Centre
- Transmission of digital images of the fundus from participating Hospitals and Physicians for evaluation
- Expert opinion and consultation by the Reading Centre
It’s difficult living with diabetes mellitus.
Ask any diabetic...
Their lives are centered around meal plans, glucose levels, and insulin or medication.
The heart, kidneys, nerves and eyes could also be affected.....
Making life miserable.

How can we help?

This booklet talks about how working together we can make a difference.