"Seeing" Between the Lines

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Diabetic retinopathy is the leading cause of blindness in the United States.[1] Approximately 5% of people with diabetes progress to severe visual loss of 5/200 or less. It is now clear that aggressive and early treatment of hyperglycemia per se in addition to appropriate screening with dilated eye exams can prevent much of the morbidity associated with this devastating complication.

In this issue, we are reprinting the American Diabetes Association's position statement on diabetic retinopathy (p. 29). This statement reviews the natural history of diabetic retinopathy, its screening guidelines, and the efficacy of laser therapy as treatment for this complication. In addition, the statement covers several additional issues that primary care physicians may find useful in their daily practice.

The first is blood pressure control. It is clear that blood pressure control slows the progression of diabetic retinopathy.[2] There are now provocative data to suggest that angiotensin-converting enzyme (ACE) inhibitors may independently protect against the development or slow the progression of retinopathy,[3,4] perhaps through reductions in retinal vascular endothelial growth factor levels.[5]

It also needs to be appreciated that rapid improvement of glycemic control may cause a *worsening* of preexisting retinopathy in both type 1 and type 2 diabetes.[6,7] Patients at highest risk for this are those with longstanding poor control with some degree of preexisting retinopathy.[8] Absence of any retinopathy at the initiation of improved control does not result in any acute problems.

Patients at high risk of early worsening should have more frequent ophthalmologic evaluations. Although not yet formally studied, a common recommendation is a slower improvement in glycemic control for these patients.

The mechanism for this condition is possibly an acute reduction in retinal blood flow, which results in retinal hypoxia and subsequent "cotton wool" exudates (micro-infarcts), capillary dropout, and neovascularization. This also may be related to an upregulation of intraocular insulin-like growth factor-1 (IGF-1) levels.[9]

Finally, anemia appears to be an independent risk factor for diabetic retinopathy.[10,11] Furthermore, an acute reduction in hematocrit may result in exacerbation of retinopathy.[12] Although not as well documented as the changes in glycemia, retinal hypoxia is probably the most important mechanism. Over the years we have seen several episodes of an acute anemia resulting in an acute worsening of retinopathy. For this reason, it seems prudent to be aggressive in replacing iron or even blood for an acute blood loss (e.g., because of surgery or gastrointestinal bleeding).

Although more research is needed, health care providers who are not eye specialists need to be more knowledgeable about and involved in the treatment of diabetic retinopathy. In addition to blood glucose control and appropriate screening as noted in the position statement, current studies suggest the importance of aggressive blood pressure control with an ACE inhibitor, slow improvement of glycemic control if preexisting retinopathy is present (the appropriate rate of decrease in HbA_{1c} is not yet known), and aggressive treatment of acute anemia.

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