INTRODUCTION

DISEASE DEFINITION

Diabetic retinopathy (DR) is a common complication in type 1 and type 2 diabetes mellitus. Diabetic retinopathy is the ocular manifestation of end-organ damage in diabetes mellitus.[4] Diabetic retinopathy has been classically considered as a microvascular disease of the retina. However, growing evidence suggests that retinal neurodegeneration is an early event in the pathogenesis of DR, which could contribute to the development of microvascular abnormalities.[5] Although defects in neurosensory structure and function have been demonstrated via optical coherence tomography (OCT) and psychophysical testing[6-14] in patients with diabetes mellitus prior to the onset of vascular lesions,[15] the most common early DR manifestations that are clinically visible include microaneurysm formation (mild nonproliferative diabetic retinopathy [NPDR]) as well as intraretinal hemorrhages (moderate NPDR). Structurally, microvascular damage contributes to retinal capillary nonperfusion and development of cotton wool spots, retinal hemorrhages, venous abnormalities, and intraretinal microvascular abnormalities (IRMA) (severe NPDR). During this non-proliferative stage, increased vasopermeability can result in retinal thickening (edema) and/or exudates that may lead to a loss in central visual acuity. The proliferative stage includes proliferation of new vessels on the disc, retina, iris, and in the filtration angle (proliferative DR [PDR]). These new vessels may lead to tractional retinal detachments and neovascular glaucoma. Vision can be substantially impaired in both non-proliferative and proliferative stages as a result of capillary nonperfusion or edema in the macula. In the proliferative stage, vitreous hemorrhage, fibrosis distorting the retina, and tractional retinal detachment can lead to visual loss. (See Natural History.)

There is considerable experimental and clinical evidence that DR is also an inflammatory disease with leukocyte involvement.[16] Chronic hyperglycemia induces expression of damaging adhesion molecules through many pathways. For example, intercellular adhesion molecule (ICAM)-1 and vascular cell adhesion molecule (VCAM)-1 promote leukostasis.[16] Early in DR, leukocytes dominate the retinal vasculature and the blood-ocular barrier breaks down.[17] Both phenomena lead to progressive dysfunction and death of endothelial cells and pericytes, which are pathophysiological hallmarks of DR. Many inflammatory cytokines (products of leukocytes) are consistently elevated in the aqueous and vitreous of patients with advanced DR and diabetic macular edema (DME).[18]

A description of the fundus findings in these various stages of DR is included in the Natural History section, and important terms are defined in the Glossary.

PATIENT POPULATION

The patient population includes all patients with diabetes mellitus.

CLINICAL OBJECTIVES

- Identify patients at risk of developing DR
- Encourage a collaborative approach between the patient, the primary care physician, and subspecialists in the management of the patient's systemic disorder, with specific attention to control of hemoglobin A1c ([HbA1c], blood sugar), blood pressure, serum lipids, body weight, and the management of renal disease, coronary artery disease,[19] neuropathy and behavioral factors (e.g., smoking)
- Encourage and provide lifelong monitoring for development of retinopathy and its progression
- Treat patients with visual loss or those at risk for visual loss from DR
- Minimize the side effects of treatment that might adversely affect the patient's vision and/or vision-related quality of life
- Provide or refer for visual rehabilitation services when a patient has visual impairment from the disease
- Refer for ophthalmological follow-up to detect potentially reversible causes of vision loss such as cataracts, glaucoma, or refractive changes
- Develop new technologies for telemedicine improvement