MODULE 7.7
Summary

In broad terms, diabetic macular edema (DME) is defined as a thickening within an area of the retina that is equal to 2 disc diameters (3 mm) of the foveal center. The edema is classified as either focal or diffuse, according to the distribution of the fluid. Clinically significant macular edema (CSME) has a more precise definition; classification is based on the presence of thickening or hard exudates (yellow flecks) within prespecified areas of the retina.[1] Other definitions exist as well. In addition, a "severity scale," which identifies the severity (mild, moderate, or severe) of DME based on the distance of retinal thickening and/or lipid from the fovea, has been developed.[2]

It's not clear, however, that any of these current definitions for DME, which are based on very old clinical trials, are helpful with treating and managing DME in patients today. One important factor not included in the current definitions is the presence of ischemic maculopathy, which often occurs in conjunction with DME.[3] It is characterized by a narrowing or blockage of capillaries in the macula, thus expanding the capillary-free area of the retina known as *the foveal avascular zone*. Ischemic maculopathy is a very severe prognostic factor for the vision of patients with DME, and one that often responds to timely treatment.

All patients with diabetes are at risk for DME, which can develop at any stage of diabetic retinopathy (DR). Its onset is usually insidious and painless, and it manifests as blurring of central vision due to fluid accumulation under the macula. Diagnosis of DME is based on clinical examination, with retinal thickening in the macula assessed at the slit lamp, often with the aid of a contact or noncontact lens. Severity of DME is graded based on the proximity of retinal thickening to the fovea.

Clinical observations can be documented with color stereo fundus photography, although neither slit lamp observation nor photography provides a reproducible measure of retinal volume change. Once a diagnosis of DME is established, fluorescein angiography can be used to pinpoint areas of focal vascular leakage for possible laser treatment.

Optical coherence tomography (OCT) has revolutionized the management of DME, providing objective documentation of retinal thickening and cystic structures that may be invisible on clinical examination. Serial OCT images allow the assessment of disease progression over time, and OCT can help to distinguish the morphologic features of DME-diffuse or focal edema, the presence of traction, etc. in the individual patient. OCT may identify the presence of DME at an early stage of disease when it might not be detected by other imaging methods. New technologies are pushing the imaging capability of OCT back past the retina, providing insights into the possible role of the choroidal vasculature in the pathophysiology of DME.

References

1. Browning DJ, Altaweel MM, Scott IU. Diabetic macular edema: what is focal and what is diffuse? *Am J Ophthalmol.* 2008;146:649-655.

2. Early Treatment Diabetic Retinopathy Study Research Group. Photocoagulation for diabetic macular edema. Early Treatment Diabetic Retinopathy Study report no 1. *Arch Ophthalmol.* 1985;103:1796-1806.

3. Wilkinson CP, Ferris FL, Klein RE, et al, Global Diabetic Retinopathy Project Group. Proposed international clinical diabetic retinopathy and diabetic macular edema disease severity scales. *Ophthalmology.* 2003;110:1677-1682.