

MODULE 3.2

Risk Factors for DR and DME

A risk factor is anything that affects your chances of getting a disease. Research has focused on risk factors for diabetic retinopathy (DR) so there has been little examination of risk factors specific to diabetic macular edema (DME).¹ However, DR and DME both develop as a complication of diabetes and have similar risk factors.

Duration and Type of Diabetes

Everyone with type 1 or 2 of diabetes is at risk of getting DR,² though type 1 may be a greater risk factor for DME.³ The longer a patient has lived with diabetes, the greater the chances of developing DR and, ultimately, DME.⁴

Patients with diabetes should get a comprehensive dilated eye exam every year.⁵

Hyperglycemia (High levels of blood glucose)

Chronic high levels in blood sugar increase hemoglobin A1c (HbA1c) levels,⁶ increase risk of developing DR⁶ and DME,⁸ and expedite the rate of disease progression.⁶

Studies have shown that keeping glycemic levels as close to normal as possible can delay or prevent the development of DR.⁹

Dyslipidemia (Abnormal levels of blood lipids)

Abnormal levels of lipids in the blood (cholesterol and triglycerides¹⁰) in diabetes patients increase the risk of developing DR and DME.¹¹

Hypertension (High blood pressure)

Elevated blood pressure increases the risk of developing DR and DME.⁸ Hypertension-associated end-organ damage is a risk factor specific for DME.³

Other Diabetes Complications

Recent research suggests that the risk of developing DME tracks with the presence of other diabetes complications. Diabetic neuropathy is a common risk factor.³

Nephropathy (Kidney disease)

Nephropathy, or kidney disease, has been found to increase the risk of developing DR¹¹ and especially DME.³

Cardiovascular Disease

Cardiovascular disease may be a greater risk factor for diffuse DME than focal.¹

Cigarette Smoking

Smoking cigarettes increases the risk of developing DR¹² and therefore affects the likelihood of getting DME.

Vitreomacular Adhesion

This condition, characterized by the vitreous attaching to the retina, has been shown to increase

the risk of developing DME, especially the diffuse form, when compared to patients with their vitreous fully attached.¹

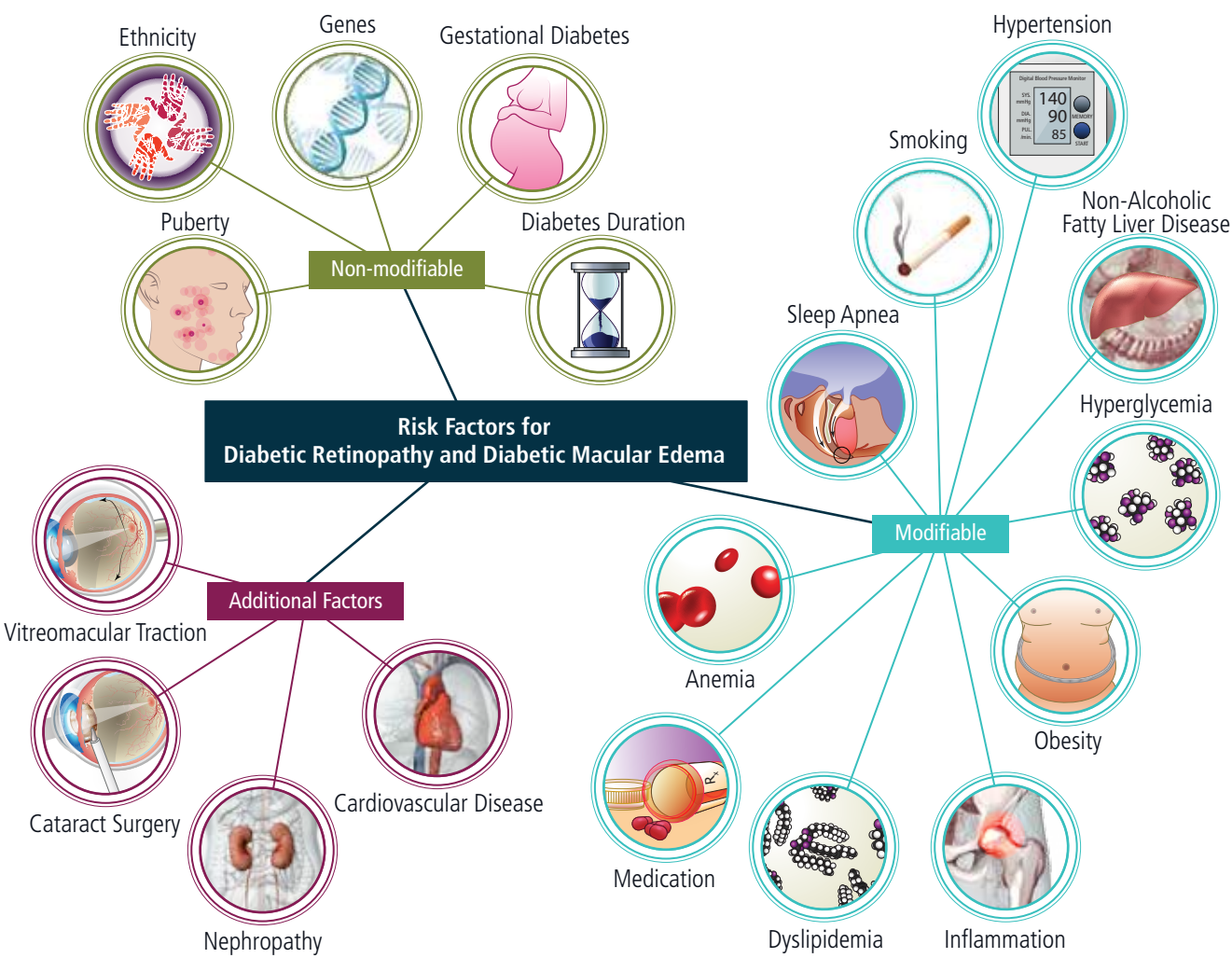
Pregnancy

Pregnant women with diabetes may be at higher risk for DR and should have a comprehensive dilated eye exam early in the pregnancy. The doctor may recommend subsequent exams for the duration of the pregnancy.⁴

Other

Other risk factors include anemia, sleep apnea, glitazone usage,⁸ obesity, genetics, frequent alcohol consumption, and sedentary lifestyle.¹⁴

Addressing the risk factors is the best way to slow or halt progression of either disease, which may occur without any changes to vision until it is too late to treat the condition. DR and DME rarely have visual symptoms in their early development, and vision loss can occur very suddenly, so it is important to get regular screenings before symptoms appear.⁵



References

1. Lopes de Faria JM, Jalkh AE, Trempe CL, et al. Diabetic macular edema: risk factors and concomitants. *Acta Ophthalmol Scand.* 1999;77:170-175.
2. American Diabetes Association. Standards of Medical Care in Diabetes - 2010. *Diabetes Care.* 2010;33(1):S11-S61.
3. Nidhi Talwa. Abstract presented at: Association for Research in Vision and Ophthalmology (ARVO) 2013 Annual Meeting; May 5-9, 2013; Seattle, WA: Abstract 1540 - C0030.
4. National Eye Institute. Facts about diabetic retinopathy. <https://nei.nih.gov/health/diabetic/retinopathy> Last reviewed September 2015. Accessed October 18, 2015.
5. National Eye Institute. NIH encourages annual dilated eye exams during National Diabetes Month. https://nei.nih.gov/news/-statements/dilated_eye Last reviewed November 3, 2011. Accessed October 18, 2015.
6. American Diabetes Association. Living with diabetes: A1C and eAG. <http://www.diabetes.org/living-with-diabetes/treatment-and-care/blood-glucose-control/a1c/>. Last edited September 29, 2014. Accessed October 18, 2015.
7. Klein R. Hyperglycemia and microvascular and macrovascular disease in diabetes. *Diabetes Care.* 1995;18(2):258-268.
8. Diep TM, Tsui, I. Risk factors associated with diabetic macular edema. *Diabetes Res Clin Pract.* 2013;100(3):298-305.
9. Wenick AS, Bressler NM. Diabetic macular edema: current and emerging therapies. *Middle East Afr J Ophthalmol.* 2012;19(1):4-12.
10. University of California San Francisco. Diabetes Education Online: Your blood lipids. <http://dtc.ucsf.edu/living-with-diabetes/diet-and-nutrition/understanding-fats-oils/your-blood-lipids/>. Accessed October 18, 2015.
11. Ding J, Wong TY. Current epidemiology of diabetic retinopathy and diabetic macular edema. *Curr Diab Rep.* 2012;12(4):346-354.
12. Estacio RO, McFarling E, Biggerstaff S, et al. Overt albuminuria predicts diabetic retinopathy in Hispanics with NIDDM. *Am J Kidney Dis.* 1998;31:947-953.
13. Bloomgarden ZT. Screening for and managing diabetic retinopathy: current approaches. *Am J Health-Syst Pharm.* 2007;64(17):S8-S14.
14. Mayo Clinic. Diabetic retinopathy. <http://www.mayoclinic.org/medicalprofs/diabetic-retinopathy-2010.html>.