

This Weeks Question

Which of the following is not a Risk Factor for Diabetic Retinopathy:

- 1. Hyperglycemia**
- 2. Body Mass Index (BMI)**
- 3. Elevated C-Peptides**
- 4. Dyslipidemia**
- 5. Hypertension**
- 6. Pregnancy**

The onset and progression of diabetic eye disease is influenced by many factors. Diabetes duration, age at diagnosis, and blood glucose control are well-established risk factors for diabetic retinopathy. The Diabetes Control and Complications Trial (DCCT) has shown that intensive blood glucose control can delay onset and slow progression of diabetic retinopathy. In addition, other factors, such as hypertension, dyslipidemia, hypercholesterolemia, renal disease, and pregnancy, also have been shown to contribute to the risk of diabetic retinopathy progression.

The higher the BMI, the greater the risk of developing health problems. A person with a BMI of 25-29 is approximately 20% overweight and is generally considered to be vulnerable to moderate health risks, while a BMI of ≥ 30 is considered obese and increases the risk of death from any cause by 50% to 150%. Heart disease, diabetes, and high blood pressure are all associated with being overweight.

In the recent population-based cross-sectional Hoorn Study, van Leiden and colleagues^[1] evaluated the risk factors affecting the prevalence of retinopathy in Dutch type 2 diabetic and nondiabetic patients using a logistic regression analysis for glycosylated hemoglobin (A1C), age, sex, hypertension, BMI, waist-hip ratio, serum lipids, and smoking. They found that the prevalence of retinopathy was positively associated with BMI as well as

kg/m², *P*= .035).

Similarly, Zhang and colleagues^[4] performed a logistic regression analysis on the DCCT group to evaluate the risk of developing retinopathy in type 1 diabetes patients with good (mean A1C \leq 6.87%) or poor (mean A1C \leq 9.49%) metabolic control. They reported a 9.8% 3-step worsening of retinopathy in the good-control group compared with 43% in the poor-control group. Although the occurrence of diabetic retinopathy was primarily related to metabolic control and duration of diabetes (*P* < .0001), an increase in BMI possibly contributed to the early progression of diabetic retinopathy in these type 1 diabetes patients (odds ratio 1.11, *P* < .05).

In conclusion, BMI is an important risk factor for cardiovascular diseases and is an important consideration in optimizing the systemic status of patients with diabetes. It elicits major health concerns in individuals exceeding 25 kg/m². Studies to date also suggest that it may be a risk factor for increased prevalence of diabetic retinopathy and for progression of diabetic retinopathy, especially in patients with type 1 diabetes.

References

1. van Leidein HA, Dekker JM, Moll AC, et al. Blood pressure, lipids, and obesity are associated with retinopathy: the hoorn study. *Diabetes Care*. 2002;25:1320-1325. [Abstract](#)
2. van Leiden HA, Dekker JM, Moll AC, et al. Risk factors for incident retinopathy in a diabetic and nondiabetic population: the Hoorn study. *Arch Ophthalmol*. 2003;121:245-251. [Abstract](#)
3. Dorchy H, Claes C, Verougstraete C. Risk factors of developing proliferative retinopathy in type 1 diabetic patients: role of BMI. *Diabetes Care*. 2003;25:798-799.
4. Zhang L, Krzentowski G, Albert A, Lefebvre PJ. Risk of developing retinopathy in Diabetes Control and Complications trial type 1 diabetic patients with good or poor metabolic control. *Diabetes Care*. 2001;24:1275-1279. [Abstract](#)