Do routine eye exams reduce occurrence of blindness from type 2 diabetes?

**EVIDENCE-BASED ANSWER**

Screening eye exams for patients with type 2 diabetes can detect retinopathy early enough so treatment can prevent vision loss. Patients without diabetic retinopathy who are systematically screened by mydriatic retinal photography have a 95% probability of remaining free of sight-threatening retinopathy over the next 5 years. If background or preproliferative retinopathy is found at screening (Figure), the 95% probability interval for remaining free of sight-threatening retinopathy is reduced to 12 and 4 months, respectively (strength of recommendation [SOR]: B, based on 1 prospective cohort study).

A reliably sensitive screening exam requires mydriatic retinal photography augmented by ophthalmoscopy when photographs are inconclusive (SOR: A, based on a systematic review). For patients with diabetes not differentiated by type, photocoagulation significantly decreases visual deterioration and reduces the chances of blindness (SOR: A, based on randomized controlled trials [RCT]).

**EVIDENCE SUMMARY**

The Liverpool Diabetic Eye Study1 prospectively evaluated the risk of vision-threatening retinopathy in a cohort that included all patients with diabetes mellitus who were registered with a general practitioner and were not under the care of an ophthalmologist. A subgroup of 4770 patients with type 2 diabetes who did not have sight-threatening retinopathy at baseline underwent at least 1 additional screen. Screening included non-stereoscopic 3-field (45° or 50° field) mydriatic photography. Median follow-up was 3.5 years (range, 1–8.5 years).

The patients were divided into cohorts based on level of demonstrated retinopathy. The mean screening interval for a 95% probability of remaining free of sight-threatening retinopathy was calculated for each grade of baseline retinopathy. Screening patients with no retinopathy every 5 years provided a 95% probability of remaining free of sight-threatening retinopathy. Patients with background retinopathy must be screened annually to achieve the same result, and patients with mild preproliferative retinopathy need to be screened every 4 months (Table).

A systematic review2 of multiple small English-language studies evaluating screening and monitoring of diabetic retinopathy found consistent results. Screening by direct or indirect ophthalmoscopy alone detected 65% of patients with...
sight-threatening retinopathy. Screening by mydriatic retinal photography, augmented by ophthalmoscopy when the photographs were inconclusive, detected 88% to 100% of such cases.

An RCT of 1700 patients with diabetes and retinopathy evaluated preservation of vision with photocoagulation. Patients were not differentiated by type of diabetes. Each patient had initial and follow-up stereoscopic fundus photography. One eye was selected at random to receive treatment and the other remained untreated to serve as a control. Because of the magnitude of difference in vision between the eyes, the study was halted at 2 years to permit photocoagulation of the untreated eyes. Patients whose eyes had new vessels on or near the disk lost vision (defined as visual acuity less than 5/200) more often in untreated eyes (18.3% cumulative rate at 2 years) compared with treated eyes (6.4%; number needed to treat [NNT]=8.4).

Another RCT of patients with diabetes showed that photocoagulation maintained vision in diabetic retinopathy if the disease was not too advanced. Ninety-nine patients, also not differentiated by type of diabetes, were each treated in 1 eye chosen at random with a xenon-arc photocoagulator. Patients underwent follow-up treatments to the treated eye by clinical indication. The untreated eyes were observed as controls. Blindness occurred significantly less often in the treated eyes (19% total after 5 to 7 years) than in the control eyes (39%; NNT=5 to prevent 1 blind eye). Patients without proliferative retinopathy at onset experienced the most dramatic slowing of deterioration; photocoagulation was more useful in maintaining than in improving vision.

**RECOMMENDATIONS FROM OTHERS**

The American Diabetes Association 2003 Clinical Practice Recommendations state that patients with type 2 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist shortly after diagnosis of diabetes. An ophthalmologist or optometrist who is knowledgeable and experienced in diagnosing diabetic retinopathy and is aware of its management should repeat subsequent examinations for both type 1 and type 2 diabetic patients.
What is the most effective diagnostic evaluation of streptococcal pharyngitis?

■ **EVIDENCE-BASED ANSWER**

Standardized clinical decision rules, such as the Centor criteria, can identify patients with low likelihood of group A beta-hemolytic streptococcal (GABHS) pharyngitis who require no further evaluation or antibiotics (strength of recommendation [SOR]: A, based on validated cohort studies). For patients at intermediate and higher risk by clinical prediction rules, a positive rapid antigen detection (RAD) test is highly specific for GABHS (SOR: A, based on systematic reviews of diagnostic trials).

A negative RAD test result, using the best technique, approaches the sensitivity of throat culture (SOR: B, based on retrospective cohort studies). In children and populations with an increased prevalence of GABHS and GABHS complications, adding a backup throat culture reduces the risk of missing GABHS due to false-negative RAD results (SOR: C, based on expert opinion).

■ **EVIDENCE SUMMARY**

In the US, GABHS is the cause of acute pharyngitis in 5% to 10% of adults and 15% to 30% of children. It is the only commonly occurring cause of pharyngitis with an indication for antibiotic annually. Examinations are required more frequently if retinopathy is progressing.

*Charles G. Tubbs, MD, Abraham Safeek, MD, Helen G. Mayo, MLS, University of Texas Southwestern Medical Center, Dallas

**TABLE**

<table>
<thead>
<tr>
<th>Screening frequency for sight-threatening retinopathy</th>
<th>Stage of retinal disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>5 years</td>
</tr>
<tr>
<td>Background retinopathy</td>
<td>1 year</td>
</tr>
<tr>
<td>Mild preproliferative retinopathy</td>
<td>4 months</td>
</tr>
</tbody>
</table>

*For 95% chance of remaining free of sight-threatening retinopathy.

---

**REFERENCES**